Title:

Development Strategies For Small Island States: The Role Of Tourism

Thesis submitted for the degree of
Doctor of Philosophy
at the University of Leicester

By

Vedat Yorucu
B. B. A. and M. B. A. (Eastern Mediterranean University)

Department of Economics
Management Centre
University of Leicester

May 1998

To my parents

Fikret and Adalet

and to my wife

Saskia

Acknowledgements

I would like to thank my supervisor, Prof. Peter M. Jackson, for his invaluable guidance, suggestions and support during the research. I am also deeply grateful to him for his motivation, and the support he gave me for participating in international conferences. He gave me the opportunity to meet academics all over the world which enhanced my academic teaching skills and learning abilities. I owe him full credit.

I also owe a lot to my wife, Saskia, for her precious contribution, patience, encouragement and understanding. I am also thankful to Prof. Cem Cakmak who recommended and motivated me to study a Ph.D. in the UK. I am grateful to Eastern Mediterranean University Rector Prof. Ozay Oral, and Vice Rector Prof. Abdullah Oztoprak. My sincere gratitude is particularly to Mr Ozkan Yorgancioglu and Mr Eren Rifat Ertanin for their help to solve the bureaucratic problems involving my scholarship.

My special thanks also go to my landlord Mr Don Grisbrook (MBE) for his company and for his contribution on the thesis.

My thanks also go to the Ph.D. students in the Management Centre and Economics Department, and especially to Mehmet Asutay, Azam Lonik, Jelal Siddiki, Sadik Cukur, and Muhittin Kaplan. I also want to thank my good friend, Muhammet Yasarata and Gill Fairman.

I am also grateful to the Department of Economics' lecturers Prof. W. Charemza and Mr M. Burridge for their contribution on econometrics. Apart from them, I send my love and greetings to the University of Leicester retired librarian Mr. Rashid Siddiki and Management Centre secretary Mrs Anjula Mehra for their help and contribution. I am responsible for remaining errors in the thesis.

Abstract

The thesis consists of two new paradigms: Porter's (1990) Determinants Of National Advantage Theory, and Krugman's (1992) Location and Trade Theory. The main objective in this thesis is to focus on the development strategies for the small island states through the role of tourism. Bulter's (1980) Tourist Area Life Cycle is implemented on the Isle of Man and North Cyprus as a descriptive study.

We modified Witt and Martin's (1987) econometric model and applied on tourism demand analysis for six destination countries (Malta, the Isle of Man, North Cyprus, Turkey, Austria and the UK). The number of tourist arrivals in per capita form are estimated in this thesis. The explanatory variables such as, income, cost of living, exchange rates, air fares and surface travel costs are included in a model for estimation. We also included dummies, trend and habit persistence variables in our estimation analysis.

We used cointegration analysis to see the long-run economic relationship on the number of tourist arrivals.

Forecasting tourism demand has also been studied in this thesis and we used RMSE to decide the best forecasting method for 5, 2 and 1 year ahead forecast horizon. HW was found the best forecast method and Econometric forecast did not perform well due to several reasons.

Finally, the aims and hypothesis are explained and related policy implications are developed.

List of Tables

List of Figures

Preface

Development Strategies for small island states and the role of tourism are areas of enhancing academic interest and curiosity. There has been quite sufficient research conducted in the area of tourism demand especially during the last decade. Since most of the empirical research is based on annual estimation, we aimed at using quarterly data to estimate tourism demand. We included Malta, the Isle of Man, North Cyprus, Austria, Turkey and the UK in our estimation model and tried to select randomly different origin countries visiting the above named destination countries. When we selected them randomly, we were careful about the countries' geographical importance, economic importance, the distance and the total number of visits undertaken during the period 1976-1995. In this thesis, we used the number of visits data on quarterly basis and consequently made a contribution to this neglected area.

One of the main difficulties encountered was the lack of quarterly income per capita data. Some countries do not publish quarterly GDP/GNP. Therefore, interpolation methods were implemented on the annual GNP/GDP data. Most of the tourist data covering the period 1976-1995 were obtained from the National Tourist Board of the related countries. The other data series i.e. consumer price index and exchange rates were collected from International Financial Statistics published by the International Monetary Fund. Quarterly population statistics were obtained from the UN Vital Population Statistics. The airfares were obtained from ABC World Airways Guide and diesel petrol prices were collected from OPEC Quarterly Energy Price Statistics. We also obtained the distances from origin country capital to a destination country capital (or important city which has tourist airports) were obtained from Europe and World Atlas. We processed most of the data in micro TSP-7 and EVIEWS-2 software packages. All test results and data series are stored in the Annex which is included in this thesis as a separate volume.

INTRODUCTION

This thesis consists of nine chapters. We decided to keep the introduction separate from the theoretical chapters. We can divide those chapters into three parts. The first four chapters are related to literature review and give a broad picture of different paradigms on the structural development of geography and trade, and the importance of tourism. They are mainly descriptive chapters. The three following chapters on the other hand, are prescriptive. They try to give a theoretical background on regression analysis, cointegration and forecasting. The theory of demand will be explained and an empirical model is going to be identified. Cointegration and forecasting results in chapter 7 will be based on the same model and we will try to find out consistency among them. We will conclude this thesis with chapter 8. We will also have brief conclusions at the end of each chapter.

In chapter 1 we are aiming to describe the meaning of *smallness*. Since we are interested in small island economies, we will look at the economic importance and the development strategies of the small island states. The new paradigm by Porter (1990) which has been in use for more than a decade seems very appropriate for the descriptive part of this thesis. Porter's (1990) *National Diamond,* and *Four Stages of National Competitive Development* in his theory are based on the new management philosophy that many small countries may achieve competitiveness in trade through technology and know how. Therefore, this is a very good key for us to identify the national diamond for North Cyprus and to see whether tourism is really the pioneer of the economy. We will have a very brief conclusion at the end of chapter 1 which will express the summary of discussions.

Chapter 2 will give us a brief understanding of *Location and Trade* theory. Krugman's (1991) Geography and Trade theory is going to be explained in this chapter within the *Localisation* and *Labour Pooling* framework. Krugman analysed the international trade specialisation from the economic geography perspectives which we are going to put forward localisation theory by identifying the advantages of being a region or a nation. *Core* and *periphery* in the geographical location are so important that we targeted them to describe the importance of the concepts and we discuss them in more detail from different dimensions within this chapter. During our literature review, we came across many comments on this issue and therefore we decided to emphasise them in this chapter.

Chapter 3 largely deals with a critique on Porter's (1990) and Krugman's (1991) new paradigms. The main criticism will be based on classical economists and the alternative approach to economic geography. The importance of multinationals in a newly developing tourist resort will be explained in this chapter. The ownership advantages are explained and this chapter will also be focused on the internalisation advantage. The mergers in airlines and hotel chains associated with airlines are the other important topics which will be followed towards the conclusion. In the brief conclusion of chapter 3, we aim to point out Porter's (1995) new paradigm on the competitive advantage of the inner cities in which he stresses the green environment and the importance of location and business development.

Chapter 4, "The Tourism Phenomena", provides a survey of the literature on tourism concepts. Whereas the introductory part categorises the definition of tourism and tourists, greater emphasis will be placed on Butler's (1980) *Tourist Area Life Cycle*. We are aiming to implement Butler's (1980) Life Cycle model on the Isle of Man which is currently facing the stagnation stage of the cycle and try to develop some rejuvenation strategies. We will also apply the same model to North Cyprus and we will analyse how North Cyprus can move from the development to the consolidation stage. Tourism Master Plan will be developed in the context of the development of North Cyprus' tourism and the necessary steps for policy and standards of development are going to follow the short conclusion.

Chapter 5 provides a survey of the literature on the tourism demand functions which aims to give the detail explanations of the theory of demand in tourism. We will also explain the methodology used and the model implemented. We will modify Witt and Martin's (1987) *International Tourism Demand Model* and identify the specifications of the model within the same chapter. The number of tourist arrivals per capita from the origin country to the destination country is the dependent variable of the model. The explanatory variables will include income per capita, cost of living, exchange rates, air fares and surface travel costs. However, we will specify population, price, substitution prices and promotional expenditures in this chapter, but they will not be included in the estimation of the model during the empirical study. Instead, their proxies will be replaced and additional dummies, trend and lagged dependent variables will be included in the estimation model. The sources of data and the simple description of estimating the demand function will conclude the chapter.

Cointegration analysis is the main topic for chapter 6. Since cointegration (Engle-Granger method and Johansen method) became very popular during the last decade, we decided to use Johansen's (1991) cointegration analysis in our thesis. From our survey we will include the theoretical background of the cointegration analysis in the beginning of this chapter. The methodology will follow the theoretical background and statitionarity (Augmented Dickey Fuller (ADF) test) in the time series are going to be discussed afterwards. The theory of integration is necessary before we make cointegration, therefore, a brief theoretical explanations are going to be forwarded. Error correction mechanism and testing for cointegration will follow the methods about modelling cointegrated series. There are three methods (Engle-Granger two-step, Engle-Yoo three-step, and Johansen Maximum Likelihood Estimation Method (Vector Autoregressive Method (VAR)) in the literature that are widely in use, therefore, we decided to explain them briefly in chapter six. However, we will only use the *Johansen Maximum Likelihood Estimation Method* (Vector Autoregressive Model) in our empirical study. Chapter 6 will also follow, the brief explanation of several forecasting accuracy techniques. A brief conclusion will complete chapter six.

Forecasting tourism demand gained popularity by many researchers and practitioners during the last two decades. We decided to use the forecast demand model in chapter 7. Archer (1987) emphasised that forecasts are needed for marketing, production, and financial planning. He added that in the tourism industry, in common with most other sectors, the need to forecast accurately is acute because of the perishable nature of the product. Archer (1976) has gained a lot of support for many researchers and practitioners for his argument that "unfilled airline seats and unused hotel rooms cannot be stockpiled and demand must be anticipated and even manipulated". This is the leading theorist's argument, which influenced us to use forecasting in chapter 7. We will use econometric (actual static), double exponential smoothing, holt-winters and box-jenkins univariate (autoregressive) methods in the empirical part of this thesis. We aim to use accuracy techniques RMSE as a judgement criterion to select the best forecasting method and it is briefly identified in chapter 6.

Chapter 7 is the empirical chapter. It will consist of three different sections. Our objective is to tabulate all findings and interpret the results within the same section. We will plan to organise section one as regression results and their interpretation, section two as cointegration results and their interpretation, and section three forecasting results and its interpretation. Finally chapter 8 is the overall conclusion which explains the contribution of the thesis briefly. We will try to identify our aim and hypothesis in this chapter and try to discover consistencies between theory and findings. The thesis will conclude with a summary of the main issues put forward and investigated, the findings and conclusions obtained and suggestions for future research in tourism demand.

Ch 1 : Size and Economic Development of Small Island States : The case of North Cyprus.

1. 1 Introduction

We shall use different terminology in this study: small countries, small economies and small states. Although they all have a slightly different meaning, here we will use these words to express the same idea, since we want to put the stress on *smallness* more than anything else.

Smallness can be defined in terms of the physical size (land area), population and gross national product (GNP) i.e. gross domestic product (GDP), or a combination of these variables as attempted by Taylor (1971). Economically, demographically and geographically speaking, countries are classified as small if they meet any of the criteria outlined by the Commonwealth Secretariat of the UN (1978). More specifically, those criteria are:

- having a surface of less than 10,000 km² of land
  and/or
- having a population of less than 1,000,000
  and/or
- having less than USD 5,000 GDP per capita

North Cyprus, for example, has a population of 177,120 (1993 figures), 3298 kilometre square land (387 km picturesque coastline) and USD 624.9 million GNP (1993 figures). The income per capita was calculated as USD 3528.4 in 1993. We see that even though it only takes one of the criteria to be considered "small", North Cyprus meets all three of them.

Having explained the size of small islands, we will now analyse *economic development*, with North Cyprus as the example case. In order to understand the economic problems of North Cyprus, we will analyse the trade and tourism sector.

North Cyprus has a comparative advantage in the tourism sector, since it provides a good sand-sea-sun combination. Kaminarides and Briguglio (1993) explained in one of their articles that tourism is a growing source of foreign exchange inflow in many small island economies. Demetriades, Al-Jebory and Kamperis (1993) stated that the main reason behind the success of the small island economies, which seems to have been overlooked by the early literature, was their comparative advantage in the provision of services of which tourism seems to be the most important one.

It is the trade sector that problems arise. North Cyprus does not have many rich natural resources, except clean air and an unpolluted sea. The mines that used to be very active before the 1970's do not provide coal any more. The country has had to import all kinds of manufacturing products from abroad. The only exportable products nowadays are citrus fruits and textiles (denim jeans and garments), since North Cyprus produces more of these products than can be consumed within the country. The country therefore exports its excess production exclusively to the European Union countries (mainly the UK) and Turkey. Nevertheless, export earnings are not enough to cover import expenditure, so that the North Cyprus economy has a growing trade deficit every year. Since it is a small country, it is a price-taker and, as such, it cannot influence its own economy. Further explanation of the deterioration in the terms of trade will be explained more clearly later. Another important factor we have to take into consideration is that the North Cyprus economy is a small open economy and at the same time inward-oriented.

Generally speaking, small islands depend upon a few primary products for their export earnings while importing a wide range of consumer as well as capital goods.

Another important issue is the geographical location of the island. Singapore, for example, has enjoyed the greatest geographical advantage in the service sector of all the South Asian countries. It is located at the crossroads of the world's busiest marine transportation route which connects the Asia-Pacific region to as far as Europe. The sea lane which passes by Singapore has been a lifeline for Japan. It is this geographical advantage that has made Singapore one of the world's busiest air and cargo ports. Many multinational corporations (MNCs) have established their operational headquarters (OHQ) there being lured, not only by Singapore's locational advantages, but also by its political stability, well established infrastructural facilities, and financial and information networks. Krugman's (1991) *Geography and Trade* theory (chapter 2) will support the argument explained below.

Furthermore, the North Cyprus economy suffers from diseconomies of scale in production, investment, consumption, transportation, education and administrative services. Some small island countries are dependent on the monetary authorities of industrial countries in the sense that " they do not have an independent currency and/or do not follow autonomous monetary policies. North Cyprus uses the Turkish lira (TL) as a legal tender, so inflation in Turkey directly affects the North Cyprus economy. Another way in which small islands are dependent on other contries is foreign aid. North Cyprus, for example, is largely financed from Turkey to cover the chronic deficit in their trade imbalance.

1.2 The Role of Trade in the North Cyprus Economy

The trade and tourism sector will now be analysed in a more theoretical way.
Classical economists, in particular Adam Smith (1925) and John Stuart Mill (1909), hinted that foreign trade would be more beneficial to a small and poor nation than to a large and rich one, simply because the latter's reciprocal demand for trading goods is much stronger than the former's. This classical proposition is further expanded and elaborated by Graham (1948), whose trade model is particularly important because it is the only multi-country, multi-good model of comparative advantage in which the (pre-trade) size of countries has been introduced as a variable, and because it yields significant results.

Graham's model shows that small countries tend to gain more from trade than large countries because they can specialise exclusively in a few goods whose international terms of trade, under which all other goods can be obtained, differ greatly from their domestic terms of trade, under which they can produce all goods themselves.

Todaro (1989) emphasized that development economics, to a greater extent than traditional neo-classical economics or even political economy, must be concerned with the economic, cultural and political requirements for affecting rapid structural and institutional transformations of entire societies in a manner that will most efficiently bring the fruits of economic progress to the broadest segments of their populations.

When we consider North Cyprus trade development, we will take the following points into consideration in which we can find Todaro's economic, cultural and political requirements as:

- The size of the country (geographic, demographic and economic)

- Historical and colonial background
- Physical and human resource endowments
- Relative importance of its public and private sectors
- Industrial structure
- Degree of dependence on external economic and political forces
- Power and institutional & political structure

North Cyprus is an independent state, but economically dependent on Turkey. Since most of the technology is transferred from Turkey, there is no reason for North Cyprus to produce it themselves. In order to overcome this problem and to raise the productivity, domestic savings and foreign finance must be mobilised to generate new investment in physical capital goods, and a stock of human capital (e.g. managerial skills) must be build up. The year 1994 was designated by the United Nations Assembly to be the *Year of Small Island States*, in the United Nations conference on sustainable development in small island states that was held in Barbados in April/May 1994. The conference adopted plans and proposals geared to addressing the environment and development needs of small island developing states. I will explain these in further chapters in more detail.

Milner and Westaway (1993) pointed out that one way of reaching higher growth rate for the small island economy is to transfer labour from one sector to another in which productivity changes accordingly. This might need some structural changes in the economy, but it is clear that in small size economies there is less regional specialisation and smaller distances (physical and cultural) between the locations and different types of sectoral activity. This is going to be explained in a more comprehensible way in chapter 2.

We believe this approach to be very relevant for the North Cyprus economy, in which 16,365 employees are working for the government in the service sector and only 5,182 in the trade sector according to the 1993 figures. A great proportion of the government budget is allocated to salaries every year. Therefore it is a perennial problem to the island's economy.

It is clear that there is another argument made by Olgun (1993) about the low productivity in the public sector. Low productivity in the public sector is mainly attributable to the government's desire to monopolise power in North Cyprus and the tendency to use secure and *comparatively advantageous* public employment as political bribery during election years. These factors have resulted in over-employment in the public sector and the mis-allocation of expensive professional and technical human resources. Over-employment is a menace and under-utilised staff set a bad example to others, resulting in endemic laziness, lack of motivation, excessive bureaucratic formalities and pressure to reduce working hours.

Table 1.1 North Cyprus Economy's GDP Millions of US$ and TL

	1983	1983	1993	1993
	US $	TL	US $	TL
Consumption		45,939.5		5,754,395.5
Investment		8,658.4		1,197,935.8
(Export-Import)		-7,557.7		-11,107.0
GDP	11.2	47,0040.2	624.9	6,941,224.3
Population*	155.5	155.5	177.12	177.12
GDP/Head*	720.25	302.46	3,528.4	39,189.3
* Expressed in thousands				

Source : State Planning Office (1994)

Table 1.2 Comparison of GDP North Cyprus and Signapore

	North Cyprus	Singapore
	1991	1991
GDP (USD million)	541.4	42,963.5
Population	173,756	2,760,000
GDP/head (USD)	3,115.9	12,717

Source : State Planning Office (SPO) North Cyprus (1994)
Singapore Statistics Yearbook (1994)

The figures indicated in Table 1.1 simply compare GDP/head between 1983 and 1993 in North Cyprus. There was a 392.83% increase in GDP per capita in eleven years. This means an annual increase of 35.7%. Table 1.2, however, demonstrates the comparisons of GDP per head between two small island states, North Cyprus and Singapore.

It is necessary to point out that GNP and GDP do not have the same economic meaning. In economic literature, GDP is the total of all economic activity in one country, regardless of who owns the productive assets. For example, Britain's GDP includes the profits of a foreign firm located in Britain even if they are remitted to the firm's parent company in another country. On the other hand, GNP is the total of incomes earned by residents of a country, regardless of where the assets are located. For example, Britain's GNP includes profits from British-owned businesses located in other countries.

Net National Product is another term which has a different meaning. The *Gross* in GDP and GNP indicates that there is no allowance for depreciation (capital consumption). It stands for the amount of capital resources used up in the production process due to wear and tear, accidental damage, obsolescence or retirement of capital assets. Net National Product is GNP less depreciation.

The relationship between the three measures is straightforward:

GDP (gross domestic product)
+ net property income from abroad (rent, interest, profits and dividends
= GNP (gross national product)
- capital consumption (depreciation)
= NNP (net national product)

Net national product (NNP) is the most comprehensive measure of economic activity, but it is of little practical value due to the problems of accounting. Gross concepts are more useful.

Analysts tend to say that GDP is a better measure than GNP, although in practice the choice between the two depends largely on national conventions. Of the major industrial countries, only Germany and Japan focus on GNP. All the rest prefer

GDP. (USA used GNP until the end of 1991). The difference between GDP and GNP is usually relatively small, perhaps 1% of GDP, but there are a few exceptions; for example, in 1989 Kuwait's GNP was 35% bigger than its GDP, due to the country's vast income from foreign assets. In the short term, a large change in total net property income has only a minor effect on GDP. When reviewing longer-term trends, it is advisable to check net property income to see if it is making GNP grow faster than GDP (see Richards, 1993).

We will use GDP per capita as a proxy for personal disposable income in our empirical study. In chapter 8 we will estimate GDP per head as an income variable for short and long-term (cointegration) elasticities. GDP figures are obtained from 23 different countries. Chapter 6 will give more detailed information.

As mentioned above, North Cyprus is heavily dependent on trade and tourism. The island has an incremental amount of imports from abroad mainly from the UK & Turkey and export earnings will never cover import expenditures. Although it is small in terms of its production and consumption capacity, it has free market economy characteristics. Because of being small and having no power to change the world prices of exportable and importable commodities, it always ends with trade deficits in the trade balance and deterioration in terms of trade. All deficits caused by trade have been financed by Turkey since 1977.

Table 1.3 External Trade of North Cyprus

(1984 - 1990)					Million TL Million US $		
	1984	1985	1986	1987	1988	1989	1990
Imports TL	50061.3	75536.2	104550.4	192745.0	310089.5	561525.8	999129.9
US $	136.3	143.0	153.2	221.0	218.1	262.5	381.5
Exports TL	14163.6	24476.1	35499.5	46072.0	72849.5	114995.5	169354.1
US $	38.6	46.3	52.0	55.1	52.4	55.2	65.5
Trade Deficit TL	-35897.7	-51059.5	-65050.9	-46673.0	-37240.0	-466530	-829775
US $	-97.7	-96.7	-101.2	-165.2	-165.7	-207.3	-316.0

Source : State Planning Organization (1994), North Cyprus

Table 1.4 Foreign Trade for North Cyprus

	IMPORTS	EXPORTS
1984	136,30	38,80
1985	143,00	46,30
1986	153,20	52,00
1987	221,00	55,10
1988	218,10	52,40
1989	262,50	55,20
1990	381,50	65,50
1991	301,10	52,50
1992	371,40	54,60
1993	363,90	54,50

Source : SPO (1994), Nicosia

I would now like to make a comparison between North Cyprus and Singapore which are both small islands and geographically important: one in the Mediterranean and the other in the South China Sea (Pacific Ocean).

Singapore gained its independence in 1965, whereas North Cyprus in 1974. The economy in Singapore has been managed by a blend of socialist and capitalist principles, and the unique mixture of a parliamentary democracy and a paternalistic-oriented authoritarian government. Socialist aspects of the Singapore economy are particularly manifested in such areas as land use, housing development, finance, and various co-operative movements.

Singapore has high trade dependency, on imports in particular; a dependency that stems from openness. It has a trade balance deficit around 16% of its GNP. Yet the tourism earnings are high enough to finance the trade deficit. In 1989, 73% of its tourist earnings financed the trade deficit.

It is clear that the North Cyprus economy has serious problems which call for need a restructuring of the economy. Our suggestion is first to control the excess spending. Secondly some of the sectors, like agriculture, should not be supported as a priority sector. Priority should be given to tourism and manufacturing; and factors of mobility should be adjusted. For example, the labour force working in agriculture should move to the tourism sector, but this does not mean that the agriculture sector should be excluded completely. There should be enough domestic production for the domestic market of residents and tourists. Potatoes are an essential commodity for catering in tourism, especially during spring and summer. What source/strategic development can be suggested to overcome the economic shortages of North Cyprus? Porter's (1990) *Four Stages of National Competitive Development* model seems a valuable one for the North Cyprus economy.

The National Diamond concept suggest tourism as a sector (besides other sectors) can be used to improve the economic situation of North Cyprus with good geographical location and natural resources. Arguably, single sector will certainly not enough to achieve the economic prosperity for a whole nation. Shipping, insurance and tourism within service industry helped Singapore to achieve economic welfare by using national diamond. Printing industry in Germany, tiles production in Italy, engineering/architectural, construction in Korea, airlines, airport terminal, port services, ship repair in Singapore, hotels, engineering/architectural, trading, commercial banking, shipping in Japan, hotel management, accounting, advertising in America, and insurance, auctioneering, money management in Great Britain played an important role to achieve an economic prosperity by using national diamond. Besides tourism, higher education, and off shore banking can also be suggested for North Cyprus economic improvement within national diamond perspective.

This model is very popular and has been in use in many South Asian countries for more than a decade. Our aim is to implement this model in North Cyprus which is competitively advantageous with good sand-sea-sun package offer. Tourism is the only sector which will act as the pioneer to overcome the shortcomings of the economy and create a chance of having economic independency.

1.3 The Determinants of National Advantage

The determinants of national advantage are explained by Porter (1990) through a *diamond.* The most dynamic national environment will achieve competitive advantage in an industry. According to Porter, technology and knowledge (know-how) are the two most important preconditions in achieving the national advantage.

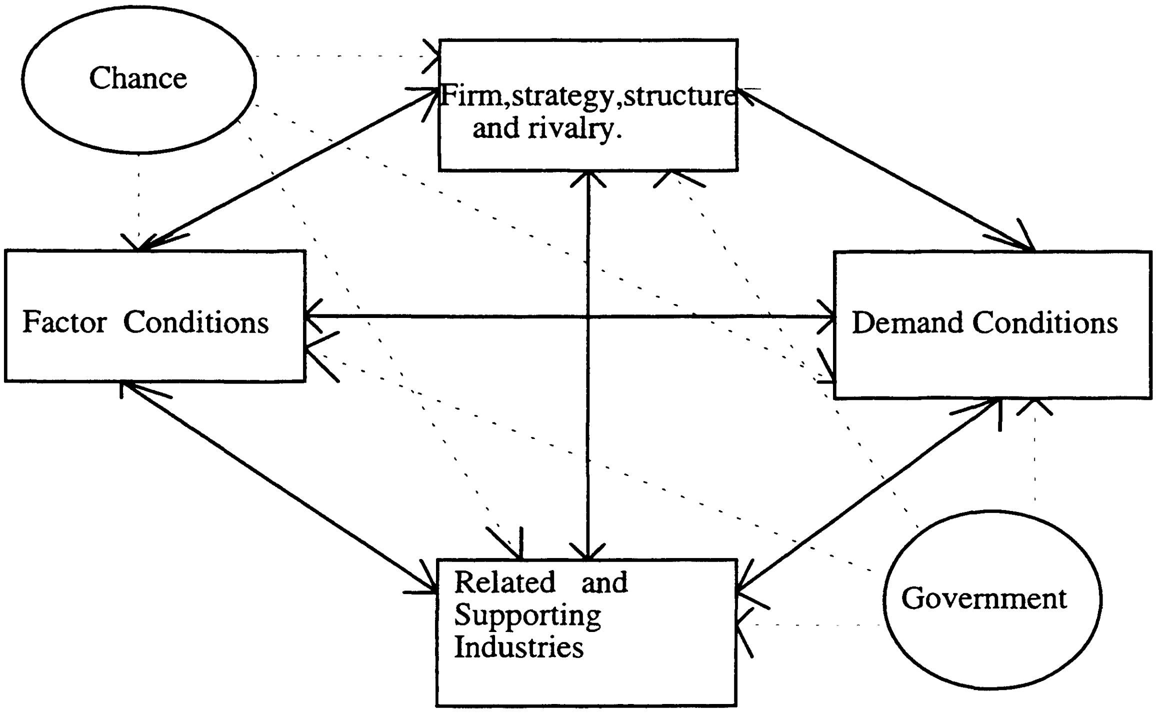


Figure 1:The Determinants of National Advantage

Source: Porter (1990)

It simply explains the term factors of production such as labour, arable land, natural resources, capital and infrastructure.

1.3.1 Factor Conditions

The standard theory of trade rests on the factors of production. According to the theory, nations are endowed with differing stocks of factors. A nation will export those goods which make intensive use of factors with which it is relatively well endowed. North Cyprus, for example, has been a substantial exporter of agricultural goods (e.g. citrus and potatoes), textiles (e.g. garments which are relatively cheaper because of the low labour costs) and tourism (e.g. selling packages that include cheap air fares, hotels, etc.).

Factors in the competitive advantage of a nation are important and can be grouped into a number of broad categories such as : human resources, physical resources, knowledge resources, capital resources and infrastructure.

The mix of factors employed differs widely among industries. A nation's firms gain competitive advantage if they possess low-cost or uniquely high-quality factors of the particular types that are significant to competition in a particular industry. The technology and know-how (knowledge skills) are the major elements which play an important role in the success of the nation's economy. Choosing and applying the right technology will make the nations firms achieve their objectives.

The hierarchy among factors, factor creation, selective factor disadvantages are important concepts which should be taken into consideration when the factor conditions of Porter's *diamond* model are explained.

1.3.2 The Demand Conditions

In Porter's *diamond*, the home *demand conditions* for the industry's product or service is another determinant of national competitive advantage.

While home demand, through its influence on economies of scale, can confer static efficiencies, its far more important influence is dynamic. It shapes the rate and character of improvement and innovation by nation's firms.

The composition of home demand, the size and pattern of the growth of home demand, and the mechanism by which a nation's domestic preferences are transmitted to foreign markets, are important concepts.

The composition of home demand shapes how a firm perceives, interprets and responds to buyer needs. Three characteristics of the composition of home demand are particularly significant in achieving national competitive advantage: segment structure of demand, sophisticated and demanding buyers and anticipatory buyer needs.

Apart from these characteristics, the *Demand Size and Pattern of Growth* is another important concept which should be explained. There are two schools of thought about the size of home demand. One argues that a large home market is a strength, because of the economies of scale. Other commentators see it as a weakness, reasoning that limited local demand forces firms to export, in order to gain a competitive advantage in global industries.

The size of home demand may be significant in some industries. Local firms often enjoy some natural advantages in serving their home market, compared with foreign firms: a result of *proximity* as well as *language, regulation* and *cultural* affinities.

Home demand is also transmitted via *political alliances* or *historical ties.* This embeds in foreign nations such things as the legal system, product or technical standards, and prefences in purchasing. Foreign aid and special political relationships among nations are having less dramatic but similar effects today. The North Cyprus - Turkey relationship is a typical example of the above explanation.

1.3.3 The Related and Supporting Industries

The presence of internationally competitive supplier industries in a nation creates advantages in downstream industries in several ways. The first is via efficient, early, rapid and sometimes preferential, access to the most cost-effective inputs.

Having a competitive domestic supplier industry is far preferable to relying on well-qualified foreign suppliers. The home market is highly visible to domestic suppliers and success there is a matter of pride. Proximity of managerial and technical personnel, along with cultural similarity, tend to facilitate a free and open information flow. Transaction costs are reduced.

1.3.4 The Firm Strategy, Structure and Rivalry

Porter specifies his theory of *national competitive advantage* with a diamond in which firms are created, organised and managed as well as the nature of domestic rivalry. The goals, strategies, and ways of organising in industries vary widely among nations. National advantage results from a good match between these choices and the sources of competitive advantage in a particular industry. The pattern of rivalry at home also has a profound role to play in the process of innovation and the ultimate prospects for international success.

Porter emphasises that important national differences in management practices and approaches occur in such areas as the training, background, and orientation of leaders, the group versus hierarchical style, the strength of individual initiative, the tools for decision making, the nature of the relationships with customers, the ability to co-ordinate across functions, the attitude towards international activities, and the relationship between labour and management. These differences in managerial approaches and organisational skills create advantages in competing in different types of industries. Labour management relationships are particularly significant in many industries, because they are central to the ability of firms to improve and innovate.

Porter also stresses that sharp differences exist among nations in the *goals* that firms seek to achieve as well as the motivation of their employees and managers. Nations will succeed in industries where these goals and motivations are aligned with the sources of competitive advantage. In many industries, one component of achieving and sustaining advantage is sustained investment. More broadly, nations succeed in industries where there is unusual commitment and effort.

Domestic rivalry, like any rivalry, creates pressure on firms to improve and innovate. Local rivals push each other to lower cost, improve quality and service, and create new products and processes. Rivalry among domestic firms often goes beyond the purely economic and can become emotional and even personal.

1.3.5 The Role of Chance

Porter make a list of chance events which are important in influencing competitive advantage. These are :

1- Acts of pure invention;
2- Major technological discontinuities (e.g. biotechnology, microelectronics);
3- Discontinuities in input costs such as the oil crisis;
4- Significant shifts in world financial markets or exchange rates ;
5- Surges of world or regional demand;

6- Political decision by foreign governments; and
7- Wars.

Chance events are important because they create discontinuities which allow shifts in competitive position. While chance events can allow shifts in competitive advantage in an industry, national attributes play an important role insofar as which nation exploits them. The nation with the most favourable *diamond* will be most likely to convert chance events into a competitive advantage. This will reflect an environment aligned to the new sources of advantage and firms pressured to move most aggressively to seize them.

1.3.6 The Role of Government

The government's real role, in creating national competitive advantage, is in influencing the factor determinants. Government can influence (and be influenced by) each of the four determinants either positively or negatively. Governmental bodies establish local product standards or regulations that mandate or influence buyer needs. Government is also often a major buyer of many products in a nation. Among them are defence goods, telecommunications equipment, aircraft for the national airline. The way this role as a buyer is played can either help or hurt the nation's industries.

The model we have been explaining, is the skeleton of Porter's *National Competitive Advantage Theory* which will be the guide to explain the North Cyprus economic development by using the *Four Stages of National Competitive Development* model.

1.4 Four Stages of National Competitive Development

Porter divided the national competitive development model into four distinct stages i.e. *factor driven, investment driven, innovation driven* and *wealth driven.*

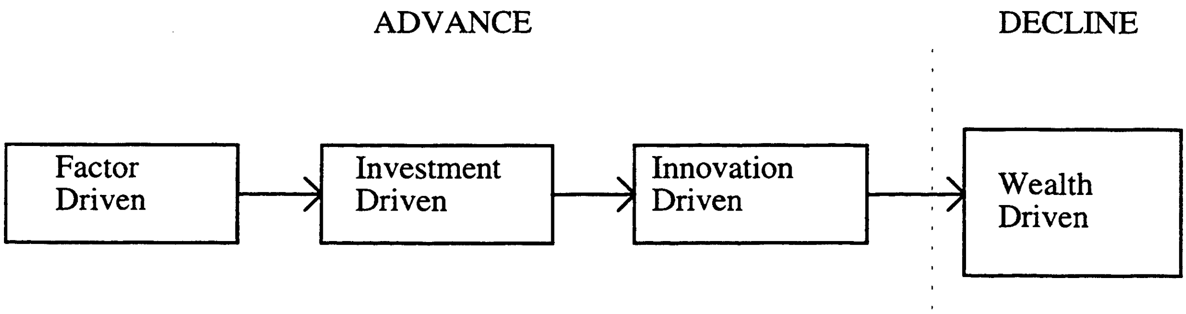


Figure 1.2 Four Stages of National Competitive Development

Source: Porter (1990)

The first three stages involve successive upgrading of a nation's competitive advantages and will normally be associated with progressively rising economic prosperity. The fourth stage is one of drift and ultimately decline. These stages, though brought schematics, provide one way of understanding how economies develop, the characteristic problems faced by nation's firms at different points in time, and the forces which propel the economy forwards or cause it to falter. Within this framework, we will implement Butler's (1980) tourist life cycle theory in North Cyprus and the Isle of Man (chapter 4) to see how Porter's four stages are achieved over the periods.

1.4.1 Factor Driven

Porter advanced his national competitive development model from the economic perspective that each country is classified into different stages e.g. Singapore (factor driven), Italy (factor driven and Innovation driven), and Switzerland (innovation driven). In the factor driven stage he states that all internationally successful industries in the nation draw their advantage almost solely from basic factors of production, whether they are natural resources, favourable growing conditions for certain crops, or an abundant and inexpensive semi-skilled labour pool.

Technology is sourced largely from other nations and not created. This occurs in some industries through imitation or more often through the acquisition of foreign capital goods.

North Cyprus has 387 km length of unpolluted coastline which is competitively more advantageous than South Cyprus. The island is not heavily industrialised, so there is a chance for the country to preserve its scenery, whereas Greek Cypriots have destroyed the southern coast with heavy industrialisation and unplanned construction responding to mass tourism.

Technology has always been imported by Turkey and because of the dependency on the Turkish economy, obsolescent technology is adopted to the North Cyprus infrastructural investments.

In this stage, an economy is sensitive to world economic cycles and exchange rates, which drive demand and relative prices. It is also vulnerable to the loss of factor advantages to other nations and to rapidly shifting industry leadership. While the possession of abundant natural resources may support a high income per capita for a sustained period of time, a factor-driven economy is one with a poor foundation for sustained productivity growth.

The mix of domestically oriented industries in a factor-driven economy may widen over time through import substitution, which is often the result of protecting the home market from foreign competition. However, import-substituting domestic industries lack competitive advantage in international terms and, if protection is widespread, it may actually reduce national productivity due to their inefficiency.

1.4.2 Investment Driven

In the investment driven stage, national competitive advantage is based on the willingness and ability of a nation and its firms to invest intensively. Firms invest to construct modern, efficient, and often large-scale facilities equipped with the best technology available on global markets. They also invest to acquire more complex foreign products and process technology through licenses, joint ventures, and other means, which allows for competition in more sophisticated industries and industry segments.

Nations, their citizens, and firms all invest in an investment-driven economy to upgrade factors from basic to more advanced ones and create a modern infrastructure. North Cyprus is not investment driven. The hydrolelectric termic plant completed in June 1994 and exploded in the first testing stage, because the raw materials and technology used were inexpensive and of low quality.

The investment driven stage, as its name indicates, is one when the ability and willingness to invest is the principal advantage rather than the ability to offer unique products or produce with unique processes. At this stage, firms still compete in the relatively standardised, price-sensitive segments of the market, and product designs often reflect foreign market needs. Production is almost solely based on foreign technology, foreign equipment, and even foreign components. As a result, process technology is modern but less modern than that of global leaders, since dependency on foreign suppliers constraints the pace of innovation.

The investment driven stage is characterised by rapid gains in employment and the bidding up of wages and factor costs.

The investment-driven model requires a national consensus which favours investment and long-term economic growth over current consumption and income distribution.

1.4.3 Innovation Driven

Innovation driven is a stage where firms create and improve technology. Favourable demand conditions, a supplier base, specialised factors, and the presence of related industries in the nation allow firms to innovate and to sustain innovation.

Firms in an innovation-driven economy compete internationally in more differentiated industry segments. They continue to compete on costs; however, it does not depend on factor costs but on productivity due to high skill levels and advanced technology. Price-sensitive, less sophisticated segments are gradually ceded to firms from other nations.

A growing international position in sophisticated services is also a characteristic of an innovation-driven economy, a reflection of the upgrading competitive advantages in the industry. Factor-and investment-driven nations are rarely successful in international service industries, except those dependent on labour costs (for example, general cargo shipping and some segments of international construction).

All innovation-driven economies will have a higher domestic service component than nations at earlier stages, because of their sophistication and affluence.

The government's appropriate role in this stage is markedly different from the previous one. Porter explained that the appropriate philosophy of intervention and types of intervention changes. Allocation of capital, protection, licensing controls, export subsidy, and other forms of direct intervention lose relevance or effectiveness in innovation-based competition.

1.4.4 Wealth Driven

It is the last and worst stage. When the wealth driven stage progresses, many companies become troubled, unemployment or underemployment pressure is persistent, and the average standard of living is declining. Social programs begin to outstrip the ability of the economy to pay for them. Taxation of wealth in addition to income tax may come to be seen as the only way to make ends meet, so diminishing incentives even further.

Porter pointed out that, in the wealth-driven stage, firms begin to lose competitive advantage in international industries for a variety of reasons. Ebbing rivalry, a result of more attention to preserving position than to enhancing it, declining corporate motivation to invest and the ability of powerful firms to insulate themselves by influencing government policy, is often at the root of the problem.

1.5 The Process of National Economic Development

According to Porter's theory, all nations are classified according to different stages and each nation goes through its own unique process of development. The "diamond", which we explained before represents and reflects each nation's unique circumstances. It is important to say at this stage that the nation's history plays an important role, by shaping such things as the basic skills which have been created, the prevailing values and norms of behaviour, the needs, tastes, and preferences which underpins demand patterns, and the challenges that have been set.

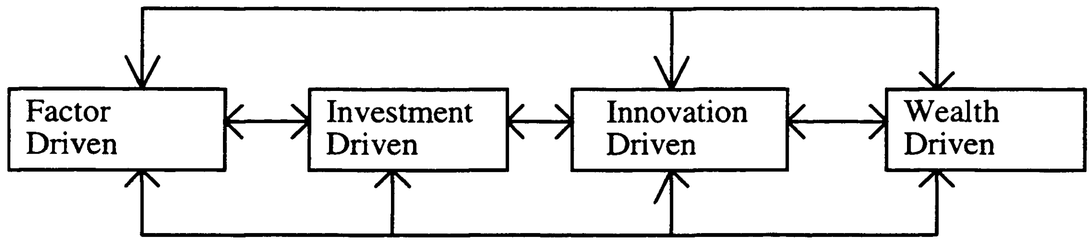


Figure 3: Process of National Competitive Development.
Source: M.Porter (1990).

Improvements in factor quantity and quality are the principal concern, described by Porter in his theory. The nation which has advanced most rapidly in the post-war period, Japan, has passed through each of the first three stages. The investment driven stage, though fraught with challenges and difficulties, has accelerated the development process in some nations. However, national economies seem to be able to move directly from factor driven to innovation driven over a long time period, skipping any noticeable transition through the investment driven stage.

The economic prosperity of a nation moves through the first three stages, because upgrading leads to increasing national productivity. A nation with unusually abundant natural resources for its size, however, can enjoy high national income despite a position in the factor-driven stage, though it is not likely to be sustainable indefinitely.

Another important point which Porter emphasised, is the resource abundance. When it is great enough, a nation may move directly from the factor-driven stage to the wealth-driven stage. Diminishing competition, adversarial labour-management relations and protection may arise as attention in the economy shifts toward preservation of the status quo. Nations such as Canada and Norway face this risk.

As for the wealth driven stage, he stressed that, if it occurs, it will eventually lead to a slow decline in economic prosperity

As a conclusion, Porter drew attention to the possibility that a nation mired in the wealth-driven stage will revert to the factor driven stage. As positions are lost in the higher productivity industries within the economy, wages and other factor costs may eventually fall so far in relative terms that a nation regresses to competing on factor costs.

Singapore remains a factor-driven economy which is largely a production base for foreign multinationals, attracted by Singapore's relatively low-cost, well-educated workforce and efficient infrastructure including roads, ports, airports and telecommunications. From this economic perspective we would cite Singapore as a good example. This country made a big achievement ever since its independence (1965).

Singapore's improvement in living standards has come from upgrading the quality of human resources and total quality management. Singapore's exceptional performance would be a good model for other small island states to educate and train its human resources.

1.6 Conclusion

In many small island states, trade and manufacturing are found to be insufficient to overcome the economic shortcomings. Tourism always takes place as an alternative sector, where foreign exchange earnings may be used to cover the financial deficits of the budget. Tourism is the pioneer sector of the economy, but it is not enough to develop the country as a whole.

Porter's competitive advantage theory has been developed in our study to make the above statement clear. The determinants of national advantage have been discussed and we have been trying to analyse the application of a national diamond. The factors which influence the diamond have also been explained here. The four different stages of national competitive development have been discussed in this chapter.

Although this chapter gives us a useful theoretical approach, we decided to enhance the understandings of the economic importance of trade between countries with Krugman's geography and trade theory in the next chapter.

Ch 2 : Location And Trade

2.1 Introduction

In the previous chapter we explained the North Cyprus economic development within the framework of *Porter's* (1990) *"National Competitive Advantage Theory"*. We described the theory by adopting the *"Four Stages of the National Competitive Development Model"* and we mentioned the importance of tourism for the future of economic prosperity.

In order to explain this further we will use Krugman's (1991) *"Location"* theory in which he develops a new approach the international economics and trade concept. He explained the "location" theory within the *economic geography* framework. As long as North Cyprus has logistic and geographic importance in the Mediterranean Sea, the theories of economic geography and of location are important topics to be studied.

Our aim is to make an analysis of the geographical relations between North Cyprus and Turkey as well as between the Isle of Man[1] and England. The relationship between North Cyprus and Turkey is very similar to the one between the IOM and England.

The IOM is a small island in the Irish Sea and it was separated, politically and economically, from England in 1860. It is 221 square miles(572 km²) and is 32.5 miles (52km) long and 13.5 miles (22km) wide. Its perimeter is 100 miles (160km) and it is 30 miles (48km) away from England, 16 miles (26km) from Scotland , 27 miles (43km) from North Ireland and 48 miles (77km) from Wales.

It is not part of England but, like the Channel Islands it is a Crown dependency with a high degree of autonomy over domestic, political and legislative matters. The

---

[1]The Isle of Man will be written as IOM hereafter.

Queen is head of state and the UK government looks after the island's foreign relations and defense, and maintains a seldom-used veto over legislation passed by Tynwald, the island's parliament. The UK and the IOM co-exist on a basis of perceived mutual benefits. The population is 71,267 according to the last 1991-April 14/15 census. Economically, one third of the GDP is earned by the offshore finance sector, and the rest from trade and tourism. Agriculture is small in terms of economic contribution. The IOM has its own bank notes and coinage. Its GDP per capita is only about 80 per cent of the UK and less than that of many European countries. The GDP per head was £6,901 in 1992, compared to £8,896 in the UK. Tourism makes a 6 per cent contribution to the GDP, whereas manufacturing makes 11 and finance 35 per cent . The rest is contributed from other sectors. The finance sector gives the greatest contribution to the IOM's economy because the island has a tax haven status.

We have already explained the demographic, geographic and economic situation of the IOM. These features put the IOM in the category of *"small states"* and classify it as a small island according to the classification of the United Nations (see chapter 1).

If we compare the IOM with North Cyprus, we see that North Cyprus is geographically bigger than the IOM with 3300km² and economically smaller with US$ 3000 GDP per capita. The population of North Cyprus is more than twice that of the IOM and it is therefore demographically bigger.

2.2 The Location Theory

We aim to analyze the location theory for the IOM & North Cyprus tourism industries within their economic geography framework. By economic geography, Krugman (1991) means *"the location of production in space";* that branch of economics which considers where things happen in relation to one another. According to his argument, countries are normally modeled as dimensionless points, within which the factors of production can be instantly and cheaply moved from one activity to another, and trade among countries is usually given a sort of spaceless representation in which transport costs are zero for all the goods which can be traded.

Krugman (1991) applied his arguments to some states in the USA and also to some EEC countries in Central Europe. We will make some modifications and implement Krugman's theory on North Cyprus. The cost of travel will be considered when using the term transportation. In tourism *a product* is a general terminology which refers to a tourist package, including accommodation, leisure, etc. So, you may assume that the service is a *"product"* hereafter for the rest of this explanation.

You may ask why we need to overlook the economic geography? There are three reasons explained by Krugman (1991). First, the location of economic activity within countries is an important subject in its own right. Second the lines between international economics are becoming blurred in some important cases. The last and the most important reason is the intellectual and empirical labouratory which it provides. The "new" trade, growth, and business cycle theories of the past decade have suggested to us a world view of economics that is very different from that of most pre-1980 theories.

Krugman (1991) also pointed out that increasing returns have a pervasive influence on the economy, and play a decisive role in history and in determining the geography of real economies. He also suggested that increasing returns affect economic geography on many scales. In his regional development argument, he preferred to explain the economic geography with a simple example : the US "manufacturing belt". The model developed sketchily and showed the interaction of demand, increasing returns, and transportation costs, all of which drives a cumulative process of regional divergence.

Geographers note that the major part of North Cyprus' tourism is concentrated in the Northern region of Cyprus, within the parallelogram of Kyrenia. Before 1974 it was Famagusta because Varosha (closed zone) was the bulk of the Cyprus tourism. After the 1974-war this area was closed for tourism as well as for settlement and was left as a restricted zone. So Kyrenia is now the core and the tourism belt contains approximately 70 per cent of the tourist accommodation and 65 per cent of the bed capacity. About 60 percent of the tourism employment is in the same region. Because the tourism belt is in the Kyrenia region, other sectors of the economy located in that region are benefiting from this situation, e.g. the financial sector (foreign exchange bureau and insurance companies), transportation (both public and private), retailing (supermarkets, shops) and many other sectors. If the tourism belt had not existed, the Northern region would have had an even smaller share of employment.

Howells (1984) explained the importance of center and periphery in one of his articles. He described that according to the filter-down hypothesis, firms and plants located in peripheral or less-urbanized areas are less technologically sophisticated than establishments located within more urbanized and/or larger urban centers and/or central regions. Because of this, the peripheral and more rural areas are less able to take advantage of, and participate in, new growth sectors of the economy. As a consequence their industry lags behind in investing, developing and adopting new products and process technology.

Dommen (1982) pointed out that a peripheral location benefits more from the spread effects if its products are income-elastic (like tourism) or if it is near the center. Nearness is measured not so much in kilometers as in convenience and cost of transport. Better transport and easier access to the services of the center encourage a wider range of trade. We will discuss the income elasticities for short-run and long-run (cointegration) periods in chapter 8. We can drive a conclusion whether income elastic countries are benefitting from low transportation costs or not.

According to Keller (1987), the function of tourism as a means of economic development for disadvantaged or underdeveloped peripheral regions is generally accepted, and its merits and drawbacks are discussed at some length in the literature. Peripheral tourism and core-periphery concepts are also explained by Butler (1980), Cohen (1972) , and Plog (1977) within the theory. Besides that, Friedmann (1972) argued that core regions, being regions with a high interaction potential, the favorable locations for headquarters and decision making functions, while peripheral regions are penetrated by core-region-based enterprises and institutions and are in a dependent position. Friedmann's theoretical concept is therefore an interesting starting point for investigating the organizational status and external control of plants and regions. He defined "core areas" as districts with both a high degree of accessibility and high level of development. Peripheral less-developed areas, on the other hand, are defined as districts with a low degree of accessibility and a low level of development.

Another argument was made by Dawes & D'Elia (1995) about tourism and core-periphery patterns. They said that if we take the 19th and the first part of the 20th century into account, tourism does not seem to be a migration from core to periphery, but more from the core to the semiperiphery. Williams & Montanari (1995), Ioannides (1995) and Williams & Shaw (1995) are other important available references.

2.2.1 Localisation

Krugman commented on the literature about industry localisation being too extensive to cite. Notable examples over the years include Hoover (1948), Lichtenberg (1960), and recently, Porter (1990).

Localisation is also explained by Healey and Ilbery (1990) from the perspective of economic geography. They made a common distinction between two types of external economy: *localisation economies* and *urbanization economies*. Localisation economies are cost-saving specific to the establishment of a particular industry, such as arise from *spatial proximity* to the units to which they are linked; while urbanization economies are cost-savings to all firms arising from location in an urban area, such as transport facilities, a range of industrial and office premises, or a pool of cheap labour. It is not always easy to distinguish between them in practice. For example, with *a pool of skilled labour*, the skilled element could be classified as a *localisation economy*, while the *labour pool* could be considered an *urbanization economy*. Urbanization economies are related to settlement size : the larger the settlement the greater the potential economies. About the structurally attractive industries Harrington (1995) referred to Porter (1990) and made these comments:

> The attractiveness of an industry is not reliably indicated by size, rapid growth, or newness of technology, attributes often stressed by executives and by government planners, but by industry structure. By targeting entry into tructurally unattractive industries, developing nations have frequently made poor use of scarce national resources.

It is certain that as long as we are dealing with tourists, location is important. Transportation cost[2] is another issue of where opportunity cost should be taken into account. Harrington (1995) argued that the opportunity cost of serving the market and the danger of losing clients to competitors increases with distance. So we can conclude that Cyprus is more advantageous than the Far East and the Caribbean Islands in terms of transportation for the potential of Asian and European holiday makers. Harrington also suggested that, the more specialized, unique or prestigious is the service provider is, the greater the access to reliable transportation and communication. It is more likely that the provider can maintain distant markets and serve as a basic activity in its local region or country.

It is Marshall (1920) who presented the classic economic analysis of the phenomenon; he identified three distinct reasons for localisation. First, by concentrating a number of firms in an industry in the same place, an industrial center allows a pooled market for workers with specialized skills; this pooled market benefits both workers and firms. Second, an industrial center allows provision of non-traded inputs specific to an industry in greater variety and at lower cost. Finally, because information flows locally more easily than over greater distances, an industrial center generates what we would now call technological spillovers.

---

[2]The distance of travel is important and related to the cost of travel.

2.2.2 Labour Market Pooling

The pool of labour may sometimes be referred to as labour resources, workforce, manpower, personnel staff, workers or human resources. In literature all have the same meanings.

Because of *"pooling"*, some people may be tempted to assume that the incentive to create a pooled labour market is something like portfolio diversification; that is, it has something to do with risk aversion on the part of workers. No doubt minimizing risk is also an issue, Krugman (1991) did not mention it before. So, even if workers are entirely risk neutral, there will be an efficiency gain from creating a localised industry with a pooled labour market.

Dual labour markets within companies is one of the most common strategies that is contemplated in many countries. These can be identified by core and peripheral workers. Atkinson (1984) is largely responsible for the formalization of the concepts, although there are strong links with Doeringer's and Piore's (1971) concept of the internal labour market. Atkinson (1984) suggested that core workers are full time, permanent employees who receive job security and high earnings in return for performing a wide range of tasks that cut across traditional skills demarcation lines. He considered that these primary labour groups are functionally flexible. They are classified as managerial and professional staff whose skills are in short supply in the external labour market; employees are therefore keen to retain their services. Shortly, they are the ones who are in perfect conditions in terms of money and working life.

Apart from these core employees, there are several groups of peripheral workers. There is a secondary labour market made up full-time employees, but their jobs are less secure, they lack career prospects, and they are often semi-skilled. Labour turnover is high, which means that their employment offers numerical flexibility to employers.

Apart from these, there are also several other groups of numerically flexible employees. The possibilities include part-time workers, temporary workers (on short term contracts), training scheme placements and home working. In the tourism sector we can sometimes simplify short term contract workers as "seasonal workers".

Because tourism has a seasonality effect, the employment policy is not always for the full time workers. It is mainly dependent on seasonal workers which is costly and difficult to handle when total quality management is concerned. Therefore wage differentiation has to be analyzed and the proximity of the core regions must be taken into consideration when employment takes place (Krugman, 1991).

Considering the size of the labour pool, Healey & Ilbery (1990) emphasized that the normal indicator of labour supply is the size of the labour pool (the number of people available for work). This can affect the location of secondary and tertiary activities, especially during periods of full employment. They pointed out that two measures of the size of the labour pool are usually employed. The first is the participation or activity rate, defined as the proportion of the total population of a given age-group in work. This is influenced by the demographic (age/sex/marital status) structure of an area's population, together with its density and distribution. A second measure is the unemployment rate.

Why do many industries concentrate in only one or two locations? Krugman(1995) said that this is not a new question. By referring to Marshall he tried to answer this question. He argued that Marshall noted how many of his nation's industries were concentrated in particular industrial districts: cutlery in Sheffield, iron working in Birmingham, lace in Nottingham and the key cotton textile industry around Manchester. Marshall (1920) offered an explanation of such concentrations that remains a classic of clarity.

Firstly, a cluster of related firms in the same area provides a large market for people with specialized skills, which means that both workers and firms have some insurance : workers against unemployment and firms against labour shortages. Secondly, a local industrial cluster supports providers of the necessary specialized services. Lastly, a grouping of firms promotes the exchange of information and thus the advantages of technology.

Ioannides (1995) also referred to the role of the state for the creation of a labour pool. He mentioned that governments promote tourism to generate economic growth and create a labour pool with a certain modicum of human capital.

Krugman (1991) analyzed his model by giving some examples which are helpful to understand. He points out that in order to make a pooled labour market advantageous, the assumption should be that each firm had to choose one location or the other, not both. If each firm could produce in both locations, or for that matter if each firm could be split into two identical firms, one in each place, then the full "portfolio" of firms and workers could be replicated in each location, and the motivation for localisation would be gone. But the most natural justification for the assumption is that there are sufficient economies of scale to militate for a single production site. In this thesis, a product was meant the holiday package, and the firms that are running in the location were the tour operators, travel agencies, airlines, hotels and restaurants.

2.3 Regions and Nations from the Economic Geography Perspectives

Krugman (1991) started with economic geography at the grand level of regional development, and of center versus periphery, largely because he had a simpler model with a more modest issue of industry localisation. Hereafter, we will use the world localisation or localisation theory in a more familiar way. Before explaining the localisation theory, he preferred to explain the meaning of a nation, and the role of political boundaries in economic geography. What is a nation? The dictionary meaning of a *nation* is a large community of people of mainly common descent, language and history, usually inhabiting a particular territory and under one government. Krugman made a critique and said " a nation is not a region or a single location". That is, when localisation and the emergence of core-periphery patterns are argued, there is no reason to suppose that political boundaries define the relevant unit over which those external economies apply. Every modern nation restricts labour mobility. Many nations restrict the movement of capital, or at least threaten to do so. Of course, there are some countries where labour can move freely; the European Union is a good example.

Krugman (1994) also compared regions and nations from a different perspective. He said that the differences between regions and nations are quantitative, not qualitative. That is, the same forces are at work in inter-regional and international trade, only their relative importance is different. In particular, regions within a country tend to be more specialized than countries and experience greater factor mobility.

He has pointed out that regions within a country tend to be more specialized and engage in more trade than countries. This is also true when regions are as large as countries. He explained this by using the regions in the USA.

We will now apply this statement to two small islands, the IOM and North Cyprus which are similar to each other. We will make comparisons between these islands in order to understand which one is more specialized in the tourism sector. Before reaching a conclusion, we will try to measure the differences and degree of specialization between their mainland, England and Turkey. Krugman made comparisons with regard to regional employment statistics for the same industries in the USA regions. Firstly, we would make simple modifications to his indication model to compare the employment statistics for the tourism sector of the Northern Cyprus regions and the IOM. Second, we will compare the indices of industrial specialization of the two islands.

Before making the comparison, we would like to clarify the problems of regional economics. According to Krugman (1991), the main difference between regional and national economic issues is the mobility factors of production: highly mobile between regions, less mobile between nations. This difference has two consequences. First, because regions must compete to hold on to mobile factors, the long-run ability of a region to export a good depends on *absolute* rather than *comparative advantage.*

Long run-patterns of regional specialization reflect absolute advantage instead of comparative advantage since wages tend to be equalized across regions (Krugman, 1991). Second, movements of capital and especially labour often give rise to cumulative processes of uneven development. This is because one region attracts increasing amounts of industry and employment away from another region and it becomes luckier than the others. So, in short, the success and failure of regions create the concepts of uneven development.

We will try to construct indices of regional/national divergence. These can be such as follows:

Let s_i be the share of industry **i** in total tourism employment in some region/ country and let **"star"** indicate that we are referring to some other region/country. Then the index we use is :

$$\Sigma_i \mid s_i - s_i^* \mid$$

Suppose two regions have identical tourism structures, that is, the industry shares of employment were the same for all **i** . Then the index would, of course, be zero. A little less obviously, if two regions have completely disjointed industry structures, the index would be 2 (because each share in each region would be counted in full). So the index is a rough way of quantifying differences in structures and hence regional specialization. In literature, Rodrik (1982) also measured the structural change and changes in comparative advantage by using the indication method.

Table 2.1 Indices of Tourism Specialization (share of employment) for North Cyprus

1993	Nicosia (South)	Famagusta (East)	Kyrenia (North)
S	0	0.128	0.581
E	-	0	0.453
N	-	-	0

Source: State Planning Office (1993), Nicosia.

Table 2.1 briefly indicates information about share of employment for North Cyprus tourism industry. We have chosen three economically important cities which are the main tourist potential cities attracting job opportunities. These are Nicosia in the South, Famagusta in the East, and Kyrenia in the North of the Island. The total employment in tourism is accounting for 4234 people according to 1993 figures. Employment in the tourism sector in Kyrenia (Northern Region) is 66.98% (2836) where in Famagusta (Eastern Region) and Nicosia (Southern Region) it is 21.68% (918) and 8.88% (376) respectively. In the Western part of Cyprus (Guzelyurt) it is only 2.46% (104) which is why we omitted this region. When we compare the South with East (Nicosia with Famagusta) we obtain a figure 0.128 which is calculated by subtracting the percentage of tourism employment in Nicosia from percentage of tourism employment in Famagusta (8.88%-21.68%=12.8%). The results obtained are in absolute term (see indices formula on page 35). The same logic is valid for the comparison of Nicosia with Kyrenia (21.68%-66.98%=45.3%) which is a simple mathematical subtraction. This figures indicates that Kyrenia is the most specialised city in tourism employment and Nicosia is the least one.

Table 2.2 Indices of Tourism Specialization for Other Countries

1991	NW-England	IOM	S-Turkey	N.Cyprus
NW-Eng.	0	0.043	0.048	0.093
IOM	-	0	0.091	0.136
S.Turkey	-	-	0	0.045

Source: BTA Her Majesty Statistics Office (1994)
SPO, Nicosia (1993)
IOM Digest of Economic Statistics (1993)
Turkish Tourism Bulletin (1993), Ankara.

According to 1991 figures the total tourism employment in the IOM was accounting for 16%, in NW England 11.7%, in S. Turkey 6.9% and in North Cyprus 2.4% respectively. When we subtract (11.7%-16%=4.3%) we obtain 0.043 which is the figure in absolute term indicating that the IOM is more specialised than NW England in terms of percentage tourism employment. When we subtract (11.7%-6.9%=4.8%) we obtain 0.048 again in absolute term which the figure represent that the NW England is more specialised than S. Turkey in terms of percentage tourism employment. The same logic also proves that NW England is more specialised than N. Cyprus with 0.093 (11.7%-2.4%=9.3%), the IOM is more specialised than S. Turkey and N. Cyprus with 0.091 (16%-6.9%=9.1%) and 0.136 (16%-2.4%=13.6%) respectively. Finally, S. Turkey is more specialised than N. Cyprus with 0.045 (6.9%-2.4%=4.5%). This indication is a brief description of the comparison between different tourist countries with their percentage tourism employment. From the above index we conclude that the IOM is more specialised in tourism employment than the other countries. We used the southern part of Turkey (the closest periphery to North Cyprus) and Northwest region of England (the closest periphery to the IOM) in which the percentage contribution is relatively lower. On the other hand, North Cyprus is not as specialised as expected in the share of employment in the tourism sector.

Hotels and other tourist accommodation, restaurants, cafes, public houses and bars, night clubs and licensed clubs, baths, saunas, libraries, museums, art galleries, sports and other recreational services provide tourism related jobs explained by the British Tourist Authority (BTA 1994).[3]

On the other hand, Sessa (1983) listed some of the principal groups of tourism-related jobs as follows :

- Construction of basic infrastructures (e.g. roads, airports, sewage/ drainage systems and cultural facilities).
- Maintenance of the basic infrastructures.
- Agricultural and other primary activities.
- Agroprocessing.
- Transport.
- Commercial and complementary services (e.g. banks, insurance, retailing, sports, and cultural services).
- Construction of receptive installations- the tourism superstructure (e.g. accommodation, restaurants, bars and tourist facilities).
- Operation of receptive services.
- Tourism welcoming services.
- Public administration.

[3]British Tourist Authority will be abbreviated to BTA for the rest of the chapter.

Table 2.3 General Tourism Statistics (1993)

	Mediterranean	NW-England	IOM	N.Cyprus
No. of Tourists visited	1,612,927	1,071,840	490,990	452,982
No. of bedspaces	235,238	101,271	10,613	7,462

\-

Source : SPO, Statistics Yearbook (1994)
ETB, Statistics Yearbook (1994)
IOM Tourism Board (1994)
Turkish Tourism Bulletin (1994)

Table 2.3 gives us general statistical information about the number of tourists visited and number of bedspaces capacity for the above named countries and important tourism regions during 1993. Mediterranean region is the most tourist attractive region in the southern part of Turkey with total 235,238 bedspace capacity. Antalya, Kemer, Side and Fethiye are the most important cities for the whole Mediterranean with a total 1,612,927 tourist visits during 1993. On the other hand, Blackpool and Liverpool are highly attractive cities with many tourist events for the Northwest region. It is the second most visited region, accounting for 1,071,840 tourist visited during 1993 and enrol 101,271 bedspace capacity with 1993 figures. When we compare the IOM with N. Cyprus, almost identical amount of tourist visited both Islands during the same year, however, the IOM suffers from bed climate conditions and North Cyprus from direct transportation. The total bedspace capacity in the IOM is accounting for 10,613 and 7,462 in the North Cyprus. The IOM with 572 km^2 land has relatively more tourist accommodation than North Cyprus which consist 3298 km^2 land.

2.4 Core and Periphery

When competition among nations matters, we should ask some important questions: should small countries fear economic integration, lest their industry be pulled into the inevitably larger cores of the neighbours ? Should countries pursue policies to ensure that they get their industrial cores? Does the core-periphery model explain uneven development at a national as well as a regional level?

We should not forget that a larger country, having a larger initial population, cannot attract all of industry away from the smaller nation, because countries are not identical to regions. So, we can say that Turkey cannot attract tourism industry from North Cyprus or similarly England from the IOM.

When we think of a large country, it is assumed to consist of many regions but not big regions. Economic integration will not favor regions in the larger country. In the core-periphery model it is possible to integrate regions within the multi-regional framework.

Krugman has assumed a discrete set of regions laid out in a one-dimensional space, because he did not want to worry about an end point, and this space would have to be circular. Six regions are laid out in a circle, with transportation possible only around the circle. Again, there is no possibility of any movement in the middle.

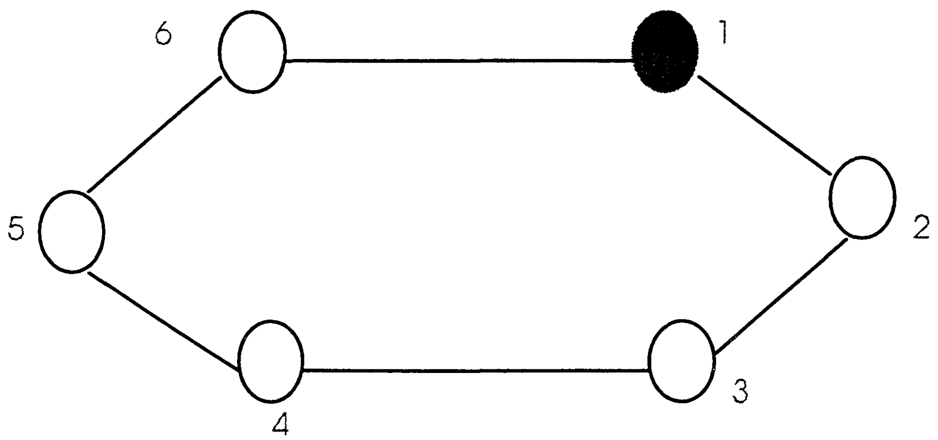


Figure 2.1 Single Core Structure in a Multi-regional Framework
Source: Krugman (1991)

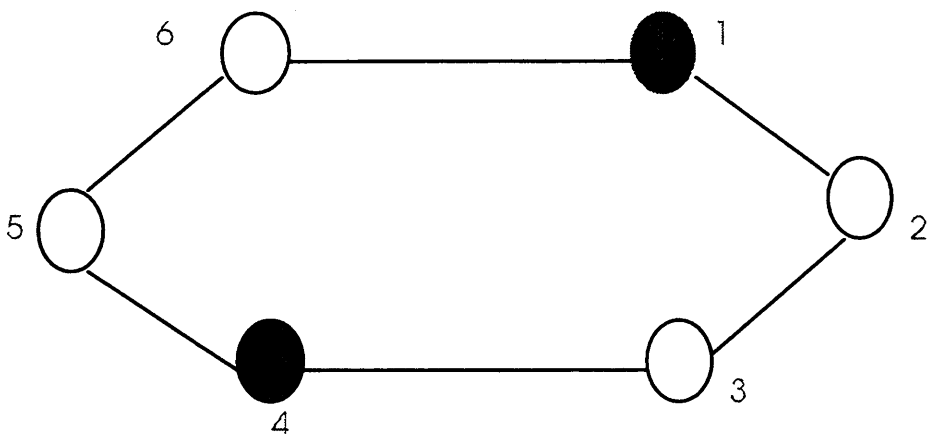


Figure 2.2 Multiple Core Structure in a Multi-regional Framework
Source: Krugman (1991)

Suppose that there are two kinds of people: farmers, who are spread equally among the nations, and workers in manufacturing, who can choose where to live. One possibility is that the economy will form a single core; this is suggested in figure 2.1 by the shading of one region. Alternatively, if transport costs are high, economies of scale weak, and the share of "footloose" production small, manufacturing production may be spread evenly across the regions.

It is also possible to have an economy which supports multiple cores. Figure 2.2 illustrates that shaded circles indicate the formation of two cores at regions 1 and 4. Each core is assumed to have a "hinterland" consisting of the two neighbouring regions.

In order to understand which picture is right, we should remember these assumptions. If transport costs are low, economies of scale is large, and the share of footloose industry in national income is large, the result will be single core; if the transport costs are high, economies of scale is small, and the share of footloose industry in national income is low, the result will be no core at all, because intermediate levels will support a multiple-core structure. It is always necessary to remember that tastes and technology make two alternatives possible, which means more than one equilibrium structure is possible.

Another hypothetical assumption can be made: the world illustrated in Figure 2.1 and 2.2 which consists of two separate countries: one of four regions, one of two. The boundary is illustrated by the dotted line in Figure 2.2. It is assumed that the two countries initially maintain sufficient barriers to trade and sufficient factor mobility so that their economic geography evolves independently, with the large country developing a core in region 1 and the small country a smaller core in region 2. In this way the two countries merge into a single economic unit.

If this is the hypothesis, then what is the consequence. The consequence has two alternatives. The ultimate equilibrium may have either one core or two. If the integrated economy ends up with only one core, then region 1, with its head start, will presumably attract all the manufacturing away from region 4. But if the integrated economy ends up with two cores, manufacturing in region 4 will actually expand at the expense of region 1, as it gains access to its full natural hinterland.

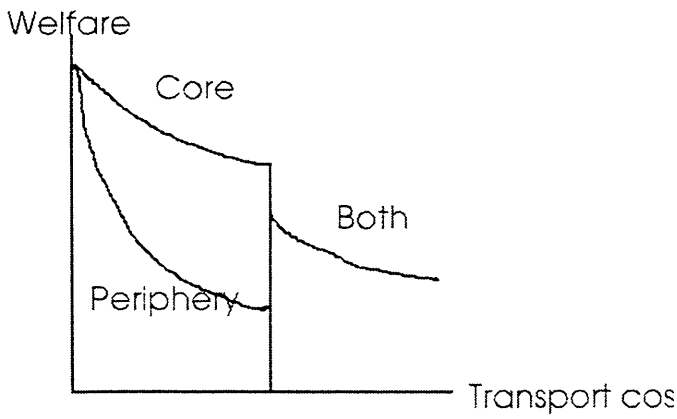


Figure 2.3 Welfare Level of Core and Periphery Regions
Source: Krugman (1991)

Figure 2.3 illustrates the welfare of the immobile "farmers" in each region as a function of the level of transport cost. When transport costs are high, there will not be a core-periphery pattern. So if the regions are of equal size, their farmers will have the same level of welfare. Lowering transport costs will raise welfare in each, to at least some extent, simply by increasing inter-regional trade. If transport costs fall enough, it is possible to reach the critical point at which the regions become differentiated into a manufacturing core and an agricultural periphery.

It is possible to change the example into manufacturing workers and tourism workers. We can change the assumption to a tourism core and manufacturing periphery or vice versa. It varies according to the terminology we use, but the logic remains the same.

It is important that when that threshold is crossed, it is apparent that whereas immobile factors in the regions which become the core will gain, initially those in the other region will loose because they will now have to import all their manufactured goods.

As long as the transport costs fall, welfare will rise in both regions. When transport costs reach zero, both regions reach a common level of welfare.

Where regions become the periphery, there is a U-shaped relationship between economic integration and welfare. First, the immobile factors in a region would prefer to be in the core rather than the periphery. Second, modest policy actions at the critical point can tip the balance in one regions favor.

2.5 Conclusion

The main object in using Krugman's (1991) *location and trade* theory in this chapter is to enhance the understanding of the importance of the geographical location of the nations. The possible scenario here is to draw a strong link between Porter's (1990)

National Diamond and Krugman's (1991) *Location and trade* theories. It is helpful to combine both approaches, because they show that nations can restructure their economies through improving technology, creating labour pooling and establishing core regions before they begin to trade with other nations. Indices are used to identify the regions' specialization in the tourism sector in the NW of the UK, South Turkey, the IOM and North Cyprus. The IOM is found to be more specialized than North Cyprus and South Turkey (Antalya) is found to be more specialized than North Cyprus in the supply side (accommodation). May be size is not the appropriate measurement parameter to compare South Turkey and North Cyprus, because results may be biased and inconsistent. Though both theorists want to explain the same phenomenon, namely the nation's economic prosperity, they sometimes contradict each other. That is why we need to be critical of both in the next chapter.

Ch 3 : The Critics On Porter's & Krugman's Theories

3.1 Introduction

This chapter will consist of two leading theoretical approaches to the North Cyprus' economic competitiveness in international trade. For the future economic prosperity of nations, Porter (1990) explained a new paradigm of *National Competitive Advantage Theory.* We explained the theory by adopting his *Four Stages of National Competitive Development Model* in the first chapter. From this perspective we have said that tourism is the National Diamond for the North Cyprus economic prosperity. In order to strengthen this idea, we decided to use the *Location Theory* (Krugman, 1991) where economic geography is taken into consideration. The *Core and Periphery Model, Localisation, Labour Pooling, and the Indication Model* proposed by Krugman are explained in the previous chapter in detail.

3.2 Evaluation of the Competitive Advantage Theory

Boscheck (1994) supported Porter's (1980) competitive advantage theory and pointed out that competitive advantage results from identifying, operationalising and controlling those decisions that result in the most cost-efficient creation of insubstitutability i.e., the elimination of competition. He added that such a competition shelter may result from the provision of a superior resource, product or service, or the prevention of access to alternative and economically viable sources of supply.

He also affirmed that a company's competitive advantage must either reflect some source of superiority in meeting customers demands or the existence of restraints to trade which prevent the use of alternative suppliers. The first type of advantage is generally considered unobjectionable although it may, as in the case of large-scale "naturally monopolistic" suppliers (such as electricity transmitters), justify some regulatory controls on prices and output. The second type of advantage, however, is banned because it is considered as resulting from "monopolising behavior" that: impedes the efficient working of the market mechanism, requires the maintenance of non-productive investments, and creates an option to extract unjustifiable profits in the long run.

Porter (1990) mentioned that economies of scale and market imperfections are indeed important to competitive advantage in many industries. For example, in global competition, firms from any nation can gain scale economies by selling worldwide. Italian firms reaped the economies of scale in appliances, German firms in chemicals, Swedish firms in mining equipment, and Swiss firms in textile machinery : why not North Cyprus in tourism? We say that tourism is the national diamond for North Cyprus. While Porter is trying to explain the diamond of national advantage using, factor conditions, demand conditions, related and supporting industries, and firms strategy, structure and rivalry; he is against the classical economists.

3.3 Criticism of Classical Economists and an Alternative Approach to Economic Geography

Classical economists like Smith and Ricardo pointed out that a nation will export those goods which make most use of the factors with which it is relatively well endowed. Porter criticised them by saying that this doctrine is at best incomplete and at worst incorrect. Basic factors, such as pool of labour or a local raw material source, do not constitute an advantage in knowledge-intensive industries. Companies can access them easily through a global strategy or circumvent them through technology.

Contrary to conventional wisdom, simply having a general work force that is high school or even college educated represents no competitive advantage in modern international competition. To support competitive advantage, a factor must be highly specialised to an industry's particular needs; a scientific institute specialised in optics, a pool of venture capital to fund software companies. These factors are more scarce, more difficult for foreign competitors to imitate and they require sustained investment to create.

Porter (1991) is against classical economists, because he says that national prosperity grows out on the capacity of the nation's industry to innovate and upgrade, but not through a country's natural endowments, its labour pool, its interest rates, or its currency values as classical economists insist. A nation's competitiveness depends on the capacity of its industries to innovate and upgrade.

As long as the labour costs, interest rates, exchange rates and economies of scale are the most potent determinants of competitiveness, why cannot we consider the classical economists' pool of labour as the most important direct tool in the determination of national prosperity. There is no doubt that a nation's industry to innovate and upgrade is important as far as technology is concerned in manufacturing industries, but it should not be generalised as the exclusive way for enlarging the national prosperity. Where the international economy is concerned, Krugman (1993) had another argument. If we want to understand differences in national growth rates, a good place to start is by examining differences in regional growth; if we want to understand international specialisation, a good place to start is with local specialisation. The geographical issues which economic geographers should worry about are the locations where production is taking place. Especially where service is concerned, this becomes even more important.

In international economics, until the 1980s, there was an almost exclusive emphasis on comparative advantage, rather than on increasing returns, as a formulation for trade. The point was that comparative advantage could be modelled by using models that assumed constant returns and competition, which were the tools at hand.

Increasing returns are no longer something to be avoided or assumed away at all costs. The new intellectual opportunities offered by this revolution in theory have, in turn, transformed a series of other fields. In international economics, the past decade has seen a complete rethinking, with the emergence of a new view in which much trade represents arbitrary specialisation based on increasing returns, rather than an effort to take advantage of exogenous differences in resource productivity. More recently, growth theorists have reintroduced the idea that sustained growth may arise from the presence of increasing returns, and old concepts like the "big push" have regained intellectual respectability. Recently some macroeconomists have suggested that increasing returns play a crucial role in business cycles.

Krugman (1993) underlined that the time had come to use the same new tools to resurrect economic geography as a major field within economics. It is no longer the case that the need to model increasing returns makes a field untouchable. Instead, increasing returns are, at the moment, fashionable. Therefore, Porter's criticism about classical economists is not strong enough and Krugman's approach on economic geography is strengthening the labour pool idea where Porter was against. Yet, there is a compromising point between two theorists, that both are defending the nation's economic prosperity.

The role of domestic rivalry illustrates how the diamond operates as a self-reinforcing system. Vigorous domestic rivalry stimulates the development of unique pools of specialised factors, particularly if the rivals are all located in one city or region. The University of California at Davis has become the world's leading centre of wine-making research, working closely with the Californian wine industry. Krugman (1993) gave similar explanations and similar examples such as: Detroit emerged as the automotive centre, New York as the garment centre, Grand Rapids as the furniture centre. We would reach the conclusion that Porter (1990) and Krugman (1991) have a compromising point on that subject. Krugman examined

> **..... the course of economic geography and development theory to shed light on the nature of economic inquiry. He traces how development theory lost its huge initial**

> **influence and virtually disappeared from economic discourse after it became clear that many of the theory's main insights could not be clearly modelled. Economic geography seems to have fared even worse, as economists shied away from grappling with questions about space-such as the size, location, or even existence of cities-because the "terrain was seen as unsuitable for the tools at hand" (Paul R. Krugman, 1995).**

Krugman's geographic model is enlightening in that, it shows that even though regions/countries may have the same demand, technology and endowments characteristics, there may be a tendency towards the concentration of manufacturing activity within only one region (the "industrialised core"), leaving the other region to the production only of agriculture (the "agricultural periphery") mentioned by Massilia (1995).

By economic geography, Krugman (1991) meant "the location of production in space"; that is, that branch of economic which worries about where things happen in relation to one another. According to his argument, countries are normally modelled as dimensionless points within which factors of production can be instantly and costlessly moved from one activity to another, and even trade among countries is usually given a sort of spaceless representation in which transport costs are zero for all goods which can be traded.

Why economic geography (Krugman, 1991) ?

1. Location of economic activity within countries is an important subject in its own right.
2. The lines between international economics are becoming blurred in some important cases.
3. It is the intellectual and empirical labouratory that it provides. The "new" trade, growth, and business cycle theories of the past decade have suggested a world view of economics to us that is very different from that of most pre-1980 theories.

We need to make this explanation, because we realise a difference in Porter's (1990) and Krugman's (1991) *national* and *regional* competitiveness. Krugman made a discrimination between regions and nations. He clarifies that regions are more specialised than countries, and regions have more factor mobility experience than countries. When Porter mentioned national competition, he meant global competition. In the case of the EC market, we should analyse the whole market on a regional basis rather than national, because different industries within the same nation may specialise and become competitive within the EC market as well as the world market.

Another criticism by Krugman (1995) was about the comparison of a country and a region with the same size. A region can be more efficient and more successful because it can be more specialised than the country. When regional territories are considered, then core and periphery concepts should be analysed.

Wallerstein (1974) suggested that the genesis of modern marketing systems rests on the interaction between economies at different levels of development. He observed that the economic system of the sixteenth century, which generated modern industrial capitalism, was made up of three interdependent parts: *a developed core* in Western Europe, *a particularly developed semiperiphery* in Southern and Eastern Europe, and *an underdeveloped periphery* in most of the rest of the world. From this, he argued persuasively that the dynamic of capitalism (or a fully developed market economy) is based on the structural imbalance created by integrating regional economies at different levels of development into a "world system", which allows the concentration of capital in one part of it. There are probably few who would argue with this part of the formulation. Despite its neglect as a serious theory of economic development by economists, it is certainly one of the more interesting contribution to a modern intellectual history. The question that is open for debate is the degree to which "underdevelopment" develops along with development to become a relatively stable economic adjustment.

Krugman (1991) identified that the core-periphery pattern depends on transportation costs, economies of scale and the share of manufacturing in national income. Where the transportation costs are concerned, then localisation should be discussed. There are three reasons for localisation :

1. The concentration of several firms in a single location offers a pooled market for workers with industry specific skills, ensuring both a lower probability of unemployment and a lower probability of labour shortage.
2. Localised industries can support the production of nontradeable specialised inputs.
3. Informational spillovers can give clustered firms a better production function than isolated producers.

Krugman (1991) based his assumptions on a two-region model and on two kinds of production : agriculture and manufacture. In agriculture, constant returns to scale, are assumed whereas in manufacture increasing returns to scale are assumed. In all of his explanation the Cobb-Douglas production function and the share of utility is structured. When labour is perfectly mobile between different regions, real wage rates will determine the location of trade. Under some circumstances, labour may tend to migrate out of the regions where there is a larger workforce than in the other region. Then regional convergence takes place. If it is vice versa, regional divergence occurs. Krugman (1979a and 1979b) explained that if we consider the extreme case where no trade in goods is possible, but labour is perfectly mobile, then a more populous region will offer both a greater real wage and a greater variety of goods, thus inducing emigration. For the tourism sector where service is concerned and income is highly elastic, the emigration of labour from one region to another is not desirable. In our thesis where North Cyprus and Turkey are neighbours and labour is perfectly mobile, North Cyprus' firms should offer higher wages to Turkish labour in order to induce them to emigrate to North Cyprus and work there. North Cyprus is lacking labour, not only in tourism but in the other sectors such as agriculture, construction and manufacturing. In equilibrium, all workers will be concentrated in one region or the other. Whichever region ends up with the population depends on initial conditions; in the presence of increasing returns, history matters.

Brezis and Krugman (1993) specified that migration has a negative effect on wages in the short run and a positive effect in the long run. As can be appreciated, this chapter is mainly on argumentative concepts. It will conclude with critics mainly on Porter and Krugman.

What endogenous migration concerns, it is explained that in reality, migration is rarely completely exogenous to economic factors. Migrants may choose to stay at home, or to seek alternative destinations, and these choices will depend on the economic opportunities as they perceive them. But in the long run, economic opportunities depend on the increase in the labour supply and in the stock of capital.

3.4 Critic of Mergers and Multinationals

Another weakness in Porter's theory could be mergers. He revealed that a strong antitrust policy, especially for horizontal mergers, alliances, and collusive behavior is fundamental to innovation. Whilst it is fashionable nowadays to call for mergers and alliances in the name of globalisation and the creation of national champions, these often undermine the creation of competitive advantage. Real national competitiveness requires governments to disallow mergers, acquisition, and all alliances which involve industry leaders. Furthermore, the same standards for mergers and alliances should apply to both domestic and foreign companies. Finally, government policy should favor internal entry, both domestic and international, over acquisition. Companies should, however, be allowed to acquire small companies in related industries when the move promotes the transfer of skills that could ultimately create competitive advantage.

However, in Brainard's (1993) model which studies the consequences of labour mobility and firms' choices of location manufacturing production, *horizontally integrated multinationals* are considered. Brainard's objective is to extend the work of Krugman (1991) in the case where double-plant firms may coexist with single-plant, exporting firms or where firms in different locations (regions or countries) are all horizontally integrated. Massilia (1995) discovered this reality and tried to explain it with an econometric study in a discussion paper.

When integration was discussed, Caves (1982) specified that the vertically integrated firm internalises a market for an intermediate product, just as the horizontal MNE internalises markets for intangible assets. When a MNE acquires another firm, the risk is reduced by entering foreign markets via an acquisition because of the information stock. He added that there is some evidence that widely diversified companies often set up a process of expanding via acquisition, whether in their national home markets or abroad, and there may be administrative economies of scale in that process itself.

Porter (1980) emphasised that global industries require a firm to compete on a worldwide, coordinated basis or face strategic disadvantage. Some industries which are international, in the sense of being populated by multinational companies, do not have the essential characteristics of a global industry. Industries with multinational companies are not necessarily global industries.

On the one hand, a global enterprise sells a fairly uniform product throughout all around the world. In Porter's model on the other hand, the MNEs views each of their businesses as independent entities. Thus the MNE has less chance of selling a uniform or standardised product, because of its attention to host-country variety. Of course, what Porter has identified is the polycentric MNE. There are other types of MNEs. Hout, Porter, and Rudden (1991) suggested that in a multidomestic industry, a company's management tries to operate effectively across a series of worldwide positions, with diverse product requirements, growth rates, competitive environments and political risks.

In contrast, a global industry pits one multinational's entire worldwide system of product and market positions against another. In a global business, management competes worldwide against a few number of other multinationals in the world market.

One of the strongest theorists on multinationals, Markusen (1995) emphasised that multiproduct and multiproduct production, whether horizontal or vertical are generally excluded from the analysis. This is potentially troubling. After all, industries characterised by scale economies and imperfect competition are often dominated by multinationals.

One organising framework was proposed by Dunning (1977, 1981) who suggested that three conditions are needed for a firm to have a strong motive to undertake direct investment. This has become known as the OLI framework: ownership, location, and internalisation. Dunning (1981) pointed out that the foreign market must offer a location advantage which makes it profitable to produce the product in the foreign country rather than simply to produce it at home and export it to the foreign market. Although tariffs, quotas, transport costs and cheap factor prices are the most obvious sources of location advantages, factors such as access to customers can also be important. Indeed, many multinationals are in service industries (e.g. hotels) in which on-site provision of the services is an inherent part of a company's business.[1] Helpman (1984) is another leading theorist in the literature on multinationals; he deals with horizontal and vertical integration.

Why do the firms multinationalise? The reasons were given briefly by Helpman (1984) :

1. Because of the tax advantage,
2. Because of saving transport costs,

[1]It is possible to think of such services as simply being characterised by high transport costs.

3. Because of no tariff restrictions, and
4. Because of playing a central role.

Apart from describing a general equilibrium system and the conditions under which firms choose to become multinational, the theory provides an explanation of trade patterns in which the multinational corporations play a central role. There is intersectoral, intra-industry and intra-firm trade.

> **A firm that produces a spectrum of varieties of the finished good will use only a small number of varieties of the middle product (here the qualification that the returns to scale are not too strong is important). And if the horizontal span of firms is such that they do not overlap in product space in the sense that no variety is produced by more than one firm , then a bilateral monopoly situation would arise between an independent supplier and the user of the middle product if the latter chooses not to produce intermediate inputs for its own use. This market structure reinforces the rationale for vertical integration that was described above [Williamson (1971), Porter and Spence (1977) and Klein et al. (1978)].**

The above paragraph is taken from Helpman's (1985) article in which he developed a new approach on the theory of international trade which predicts elabourate trade patterns whose components include intersectoral, intra-industry and intra-firm trade, with the volume of intra-firm trade consisting of trade in invisible and intermediate inputs. This theory goes a long way towards explaining observed trade patterns by means of general equilibrium models and it can shed light on international policy issues such as tariffs and corporate taxation.

We realise from the literature that Helpman and Krugman (1985) are in the same parallel on vertical integration and Markusen and Hortsmann (1987) on the horizontal integration.

Rugman (1982), who is one of the most famous leading theorists on multinationals, emphasised that internalisation theory demonstrates that the MNE is an organisation which uses its internal market to produce and distribute products in an efficient manner in situations where a regular market fails to operate. In particular, the MNE allocates intermediate products such as knowledge to desirable world markets.

On a parallel track, Dunning (1981) sought to explain the MNE in terms of an *eclectic theory* of international production. There is essentially no substantial difference between the eclectic theory developed by Dunning and the internalisation theory, once the assumption is made that market imperfections are exogenous. The potential difference in the theories arises only if the MNE is assumed to have the power to generate its own firm-specific advantages over time; that is, to endogenise them. In essence, this is not a substantive difference, merely a choice of the suitable method of modelling the MNE.

Rugman (1982) said that MNEs often engage in backward integration to ensure quality control of their goods and services. They then sell to the upper end of the market, where the provision of good quality products is demanded and where a premium for this knowledge advantage can be realized. This occurs (e.g. in the international hotel industry) where buyer uncertainty is reduced by the provision of a good quality service through a worldwide reservation system, mainly for businessmen. In this case the advantage of the MNE lies in its ability to generate sufficient know-how to guarantee a good quality product to consumers.

As long as our thesis is relevant to tourism, we are more interested in the service sector, especially multinationals in the tourist trade. Dunning and McQueen (1982) applied the eclectic theory of the MNE to the international hotel industry. This work complements related papers by Dunning and Norman (1979 and 1981) on the application of the eclectic model to the determination of multinational office location. Both studies examine the conditions under which the theory is relevant in the service sector; they are consequently valuable additions to a literature which has its first focus on the role of MNEs in manufacturing industry. Dunning and Norman (1979 and 1981) take the three eclectic theory conditions (ownership advantages, location and internalisation) and use them to study the location of international offices. One of their interesting findings is that quality control is more difficult and costly for office services than for international hotel chains and that the fixed costs of FDI[2] in offices are lower than in hotels. Therefore the barriers to FDI are lower for office services than for international hotel chains.

Dunning and McQueen (1982) implemented the eclectic theory in another part of the service sector : the international hotel industry. They identified three conditions as being necessary for multinational activity : ownership, location and internalisation advantages. They found that the eclectic theory broadly explains the patterns of FDI in this industry with the exception of location advantages (which are irrelevant). Ownership advantages operate as a brand name "experience good" in the hotel chains which also internalize knowledge or other types of firm-specific advantages.

Rugman (1982) underlined that the internalisation theory is a more useful explanation for the multinational enterprise than more eclectic approaches, because in the internalisation theory only exogenous environmental parameters are modelled in order to explain the changes in countries' macro economic variables.

Buckley, Newbould and Thurwell (1988) debated the constraints of the 'ideal' market servicing strategy which only exists when proper regard is paid to the constraints on forms of market servicing. For example, exports are not feasible for many firms in tourism, because of the need to perform the service in situ. It is similarly ruled out for bulky or perishable products or when the key activity is location specific, e.g. natural attractions or sunshine. Licensing is often not feasible because of the difficulties of finding a licensee or franchisee with all the right qualities, notably with the ability to exploit the transferred information fully. Firms are also loath to lose their key proprietary advantages by market transfers. FDI faces severe constraints in terms of capital availability and management skills. It is also regarded as highly risky. This is particularly true for small firms and first time foreign investors. Market servicing strategies, therefore, must be

[2] FDI stands for Foreign Direct Investment.

related to the firm's available resources. It is relatively easy for firms to become over-extended if they attempt to penetrate too many foreign markets in too short a time-span. Witt, Brooke and Buckley (1995) also commented on an incremental or step-by-step approach to foreign market entry and stated that this strategy can be based on the identification of markets that are 'close' to home in terms of business practices and conditions, language, lifestyle and historical background, in order to avoid problems of more 'distant' markets, which can be tackled as the firm's international experience grows.

3.4.1 Ownership - Specific Advantages

If we decide to evaluate the net advantages of foreign firms in the hotel industry, we should first examine the nature of the product supplied by the industry. Essentially it has three ingredients.

The first, and most important, is a package of *"on premises" services* which offer a particular life-style and ambiance for the customer where he is a guest. All hotels provide the basic services of lodgings and food and drink, but the kind and quality of accommodation and substance varies considerably as for other services offered.[3]

The second ingredient is the provision, or arrangement, of before, at the time, or after *"off premises" services* for their guest, e.g. transport from home or the airport to the hotel, reservations with restaurants and/or other hotels, local excursions and sightseeing tours, booking facilities for theaters, sporting events, etc.

The third component of the product of hoteliers is the extent to which a customer may be assured that the services he is actually being sold are those he

---

[3]These include the location of hotel, entertainment, leisure, shopping, conference and business facilities, the extent and quality of housekeeping and restaurant services, the decor and furnishings of public rooms and the general amenities of the hotel. e.g. gardens, provision for children, TV in bedrooms, etc.

expects to obtain. *A "trademark" of guarantee* may be particularly important where customers are buying a product "sight unseen" and have little real knowledge of what is being offered for sale. Indeed it is characteristic of the international hotel industry that many guests are one-time visitors; and that assessment of the product's ability to satisfy wants can only be experienced after it is bought.

Hotels do not just provide a standard room but a large number of ancillary services catering for the requirements of a particular clientele and this is closely reflected in their choice of the location of the hotel, pricing and marketing strategy. The Holiday Inn e.g., the world's largest international hotel chain,[4] is generally aimed at the family group and lower-level management staff market. Inter-Continental Hotels and Hilton (respectively the second and third largest) are geared more to meet the needs of the business travelers, while Sheraton (fourth largest) aims for the luxury. Hotels which are closely linked to international tour operators (wholesalers), such as Club Mediterranee, Thomas Hotels, Caledonian Hotel Management, Steigenberger Hotels and Neckerman and Reisen, cater for the middle-level three-star segment of the market. Trusthouse Forte (sixth largest) covers a large part of the range from luxury (e.g. George V, Paris) to small country hotels in England. The international hotel industry can therefore be viewed as producing differentiated products in the same way as, for example, the car or cosmetic industry.

---

[4]These sequences have been done in 1982 among the world largest hotels, however, the rank has changed a lot within ten years.

Table 3.1 The Largest Hotel Groups And Number Of Bed Capacity (1994 figures)

Group	Rooms	Hotels
Hospitality Franchise Systems	354,997	3,413
Holiday Inn Worldwide	328,679	1,692
Best Western International	273,804	3,351
Accor Group	238,990	2,098
Choice Hotels International Inc.	230,430	2,502
Marriot Corporation	166,919	750
ITT Sheraton Corp.	132,361	426
Hilton Hotel Corp.	94,653	242
Forte	76,330	871
Hyatt hotels/Hyatt International	77,579	164
Carlson/Radisson/Colony	76,069	336
Promus Cos	75,558	459
Club Mediterranee SA	63,067	261
Hilton International	52,979	160
Sol Group	40,163	156
Inter-Continental Hotels	39,000	104
Westin Hotels & Resorts	38,029	75
New World/Ramada International	36,520	133
Canadian Pacific Hotels	27,970	86
Societe du Louvre	27,427	398

Source: Vellas and Becherel (1995)

In the United Kingdom, the major chains are publicly quoted companies (plc). They comprise up nearly 25 per cent of the industry, recording an 11.8 per cent increase from 1988 to 1991. The largest group is Forte with 338 hotels in the UK (29,530 rooms) followed by Mount Charlotted Thistle Hotels with 109 hotels (14,263 rooms) and Queen Moat Houses with 102 hotels (10,434 rooms). Almost 40 per cent of plc rooms are in the five primary UK cities and are concentrated in the middle and upper level of the market. Forte, the 60-year old family-run international hotel dynasty, succumbed to a 3.9 billion hostile bid from Granada, the television-to-motorway service group (Guardian 1996, Jan 24).

Hotels and airlines are good examples of multinationals, as Dunning (1981) clearly stated. Leading international hotel chains are racing to become the first Western hoteliers to open hotels in the Lebanese capital of Beirut after the end of the civil war. The Inter-Continental and Marriot chains were planning to open luxury hotels in the city, and are due to be followed by other hotel groups over the next few years such as Forte and Hilton International (The Times, 1995 Nov).

That is to say that MNE "involvement", at least in developed countries, would be predominantly in hotel reservation and referral systems, backed up by regular inspection to ensure standards of quality. It is certainly not obvious that the hotel sector in developed countries suffers from any significant market failure in the supply of trained personnel which would justify hotels engaging in the high costs associated with what are often quite elabourate training programs.

3.4.2 Firm - Specific Characteristics of Ownership Advantages

The UNCTC Report (UNCTD, 1982) identified four main groups of international corporation in the hotel sector :

1. hotel chains associated with airlines,
2. international hotel chains,
3. management advisory companies, and
4. tour operators or travel agents.

Some hotels emphasise their advantages in marketing and concentrate on referral systems (e.g. Best Western) and franchising (e.g. Holiday Inn). Others regard themselves as providing a package of professional, managerial and organizational services which cover every stage of hotel operations (e.g. Hilton International, which explicitly rejects involvement solely through franchise agreements).

Airline-associated MNE chains have a marketing advantage as being able to arrange advertising and reservations in conjunction with that of the parent company airline. Witt, Brooke and Buckley (1995) said that hotel chains associated with airlines have various arrangements, but most often these are through a minority equity stake loosely tying the hotel to the airline and enabling cross marketing to take place and packages to be bought with 'associated' hotels. Specialised international hotel chains are a key component of international operations. Such chains frequently franchise operations which are often ultimately owned by the conglomerate parent company. Specialist international hotel development and management companies appear to be in decline, as explained by the authors named above. Their business has largely been in the developing countries, but with the desire for local participation the franchise has become more popular.

Similarly, hotels associated with tour operators (wholesalers) will also presumably be able to plan for and maintain higher occupancy rates because the parent company is in a central position in channeling tourists towards its own hotel. The tour operator and travel agents who are involved in the international hotel business are enabling to control the accommodation needs of the customers and to package operations. It is to be noted that the ultimate owners of travel firms (like hotel chains) are often conglomerates, whose other interests lie outside the tourism field.

The factors which determine the profitability of MNE involvement in the hotel sector will also broadly determine the profitability of FDI, while the volume and direction of international trade and investment[5] will determine the flows of international business tourists, thereby determining the location of MNE hotels, since they largely cater for this section of the market.

Within the broad picture, firm-specific variations occur. For example, there is reason to suppose that the airline-associated MNEs chain favor countries, and locations within countries, served by the parent company airline. Indeed the airlines' international hotel operations may be regarded, at least in the initial stage of development, as an important part of the "development arm" of the airline, consolidating market shares on particular routes or indicating commitment to a particular country. Thereby increasing the chance of being

[5] Keller (1987) will be used to explain levels of investment in the next chapter.

offered traffic rights on new and potentially lucrative routes. This was certainly the case in the early years of Inter-Continental Hotels (operated by PanAm) and Hilton International Inc. (operated by TWA) and appears to be currently so for Japan Airlines, Continental Airlines and, to a lesser extent, British Caledonian and Air France (Meridien Hotels).

The methods of operation of international airlines tend to be wholly owned core business, combined with a network of joint ventures, minority owned operations and co-operative technical agreements in business areas bounding the core. The exception to this rule is the increasing diversification down the marketing chain into tour operation and the wholesaling and retailing of inclusive tour holidays and travel packages.

3.4.3 Internalisation Advantage

International tourism would appear to offer substantial benefits from the horizontal integration of airlines, hotels and tour operators (wholesalers) and indeed all the major international airlines have tour operating interests. Many have hotel interests and some of the largest European tour operators have close associations with charter airlines and operate hotel subsidiaries. However, these linkages are, with the exception of some tour operator-charter airline links[6], generally not significant. For example, although Hilton International is wholly owned by TWA and Inter-Continental Hotels (ICH) by Pan-Am[7], these hotel groups are in fact largely operated as separate professional and specialist hoteliers in their own right and whilst at first there was a close complement between the airline's routes and the location of hotels, this is no longer the case.

Only 22 per cent of Hilton International hotels and 60 per cent of ICH are at or near destinations served by the parent company airline. Some major airlines, for

[6] E.g. Thomson (the largest UK tour operator organizing over three-quarters of a million inclusive tour holidays) and Britannia Airways are both part of the International Thomson Organization.
[7] Acquired by Grand Metropolitan Hotels in August 1981.

example British Airways, do not operate any hotels[8], while the other airlines[9] have disposed of some or all of their interests. The only exception they have found is Japan Airlines which owns or manages seven hotels outside Japan and has developed marketing or referral arrangements with 48 others[10].

The MNE may also introduce the sophisticated technologies associated with large hotels rather than the simpler technologies of small-scale hotels (which may be more appropriate, particularly for resort tourism) in order to reduce the appropriateness problem and increase the returns of the MNE.

Finally, if our analysis of the industry is correct and in particular if the MNE hotels do not simply produce a "quality" product but a differentiated one as well, then investment in training by the government will be a necessary but not a sufficient condition for a successful indigenous hotel section. Cooperation with an established MNE will also be required both to impart proprietary knowledge and to enable effective marketing of the hotel.

Caves (1982) has emphasised that after describing the arm's length market for industrial technology, we turn to the transfer of technology by MNEs, which leads into the product life-cycle and overall patterns in the flow of technology and innovations among countries.

Krugman (1979b) presented a model that does not explicitly capture MNE as a capital arbitrator but it develops the general-equilibrium implications of technology transfers. He explained the gains and losses of the technology transfer between the home and foreign country with an assumption of "new goods" (technologically known by home) and "old goods" (are those producible in foreign). In his assumption labour is the only factor which is, immobile between Home and Foreign.

---

[8]Although it does have some minor equity participation with some other European airlines in the Penta Group of hotels.
[9]E.g. KLM, American Airlines.
[10]All information given above covers the period before 1982. The recent developments are given with the references of the newspapers.

For capital, he assumed that it is internationally mobile and explained the equilibrium condition with its rate of return. Capital movements in Krugman's model (1979b) are a consequence of technology transfer, not a cause. There is also a sense in which they substitute for technology transfers in making world production as efficient as possible. That is, technology transfers shift the world's production possibility frontier outward, because they permit producing the existing quantity of the new good at a lower resource cost.

3.5 Conclusion

Porter (1995) in his "Competitive Advantage of the Inner Cities" said that an economic model must begin with the premise that inner city businesses should be profitable and positioned to compete on a regional, national, and even international scale. These businesses should be capable of not only serving the local community but also exporting goods and services to the surrounding economy. The cornerstone of such a model is to identify and exploit the competitive advantages of inner cities that will translate into truly profitable businesses. The real need and the real opportunity is to create wealth. We also understand that Porter is agreeing with Krugman.

In his new model, Porter (1995) stressed on Location and Business Development, and debated on clusters that arise in a particular location for specific historical or geographical reasons; reasons which may cease to matter over time as the cluster itself becomes powerful and completely self-sustaining. In successful clusters such as Hollywood, Silicon Valley, Wall Street, and Detroit, several competitors often push one another to improve products and processes. If location (and the event of history) give rise to clusters, it are clusters that drive economic development. They create new capabilities, new companies, and new industries.

To bring the theory to bear on the inner city, we must first identify the inner city's competitive advantages and the ways inner city businesses can forge connections with the surrounding urban and regional economies. There is a common misconception that the inner city enjoys two main advantages: low cost real estate and labour. Real estate and labour costs are often higher in the inner city than in suburban and rural areas. Porter's ongoing research on urban areas across the United States identifies four main advantages of the inner city:

1. strategic location,
2. local market demand,
3. integration with regional clusters, and
4. human resources.

Inner cities are located in what should be economically valuable areas. They sit near congested high rent areas, major business centres, transportation and communication nodes. As a result; inner cities can offer a competitive edge to companies which benefit from proximity to downtown business districts, logistical infrastructure, entertainment or tourist centres, and concentration of companies. Moreover, in deciding what types of business are appropriate to locate in the inner city, it is critical to be realistic about the pool of potential employees.

The most critical aspects of the new economic model - the importance of the location of the inner city; the connections between the inner city businesses and regional clusters; and the development of export-oriented businesses - require the presence of strong logistical links between inner city business sites and the surrounding economy. Inner city companies without well trained managers experience a series of predictable problems that are similar to those that affect many small businesses: weaknesses in strategy development, market segmentation, customer-needs evaluation, introduction of information technology, process design, cost control, securing or restructuring financing, interaction with lenders and government regulatory agencies, crafting business plans, and employee training.

Location in an economically distressed area and employment of a significant percentage of its residents should be the qualification for government assistance and preference programmes. Government entities could also develop a more strategic approach to developing transportation and communication infrastructures, which would facilitate the movement of goods, employees, customers, and suppliers within and beyond the inner city.

Another modernisation made by Porter and Linde (1995) is about environmental studies. They emphasised that properly designed environmental standards can trigger innovations that lower the total cost of a product or improve its value. Such innovations allow companies to use a range of inputs more productively - from raw materials to energy and labour; thus offsetting the costs of improving environmental impact and ending the stalemate. Ultimately, this enhanced resource productivity makes companies more competitive, not less.

Companies can always innovate at low cost to reduce environmental impact. However, companies show that there are considerable opportunities to reduce pollution through innovations that redesign products, processes, and methods of operation. In the Hotel for example, sewage drainage systems in big complexes causing pollution which is not acceptable for tourists. Administration pays much for building highly innovated systems in order to avoid that sort of risk.

Today globalisation is making the notion of comparative advantage, obsolete. Companies can source low-cost inputs anywhere, and new, rapidly emerging technologies can offset disadvantages in the cost of inputs. Since technology is constantly changing, the new paradigm of global competitiveness requires the ability to innovate rapidly. Porter and Linde (1995) argue that resisting innovation leads to loss of competitiveness in today's global economy.

This new paradigm has profound implications for the debate about environmental policy; about how to approach it and how to regulate it. The new paradigm has brought environmental improvement and competitiveness together. It is important to use resources productively, whether those resources are natural and physical or human and capital. Environmental progress demands that companies innovate to raise resource productivity; and that is precisely what the new challenges of global competition demand. Resisting innovation that reduces pollution, as the US car industry did in the 1970s, will lead not only to environmental damage, but also to the loss of competitiveness in the global economy. Developing countries that stick with resource-wasting methods and forgo environmental standards, because they are "too expensive", will remain uncompetitive, relegating themselves to poverty.

In the case of tourism, a destination which is heavily constructed with huge buildings which harm the environment, especially the green and natural scenery, loses competitiveness and needs a further rejuvenation as we will explain by using Butler's (1980) Tourist Destination Life Cycle concept in the next chapter. This situation has already been experienced by Spain and South Cyprus.

Ch 4 : Tourism and Economic Development

4.1 The Tourism Phenomena

Tourism has grown in international importance over the last two decades and is one of the largest industries in the world. Tourism has a major economic impact on the wealth and development of many countries - especially small islands. Economic prosperity was achieved quickly in South Cyprus, Malta, Greece, Spain and many other countries due to the mass tourism market. The World Tourism Organisation Secretary General, Francesco Frangialli (WTO, 1998) emphasised that tourism contributes more than 6 percent of the world's GNP and deriving employment opportunities accounting for over 200 million jobs world-wide. Inbound tourism as an export and an earner of foreign exchange for the host destination countries assumes vital importance. The econometric analysis of tourism demand is going to be explained in chapter 8 and the income and price elasticities will give us better understandings of how host destination countries are progressing from tourism.

4.1.1 The Definition of Tourism

Before defining theoretical definitions of tourism we will explain how tourism started in the world. What is its history? According to Turner and Ash (1975), a Baptist preacher Thomas Cook organised the first excursion train to carry nearly 600 people from Leicester to Loughborough for a temperance meeting on 5th July, 1841. Since then the word "*tourism*" became popular and in daily use. In fact there are many definitions available for tourism and sometimes it is difficult to give the most correct explanations, but we will try to give some of the selected ones.

Gunn (1988) for example, considers that tourism includes all travelling except commuting. Another definition stresses that tourism involves travelling away from home for leisure purposes. It is therefore seen as a subset of leisure and recreation.

Kelly (1985) writes that tourism is ".....recreation on the move, engaging in activity away from home in which the travel is at least part of the satisfaction sought". The World Tourism Organisation defines that tourism includes all travel that involves a stay of at least one night, but less than one year, away from home. This therefore includes travel for such purposes as visiting friends or relatives, or to undertake business. Jafari (1977) defined tourism as the study of man away from his usual habitat, of the industry which responds to his needs, and of the impacts that both he and the industry have on the host's socio-cultural, economic and physical environment. On the other hand, Smith (1988) said that tourism is the aggregate of all businesses that directly provide goods or services to facilitate the home environment. Murphy (1980) defined tourism as an industry which uses the community as a resource, sells it as a product, and, in the process, affects the lives of everyone. Ryan (1993) explained tourism from the supply & demand perspective. According to Ryan, it is a study of the demand for and supply of accommodation and supportive services for those staying away from home, and the resultant patterns of expenditure, income creation and employment. British Tourist Authority (BTA) described tourism as a stay of one or more nights away from home for holidays, visits to friends or relatives, business conferences or any other purpose, except such things as boarding education or semi-permanent employment. Williams & Shaw (1995) brought a different approach to tourism; they differentiated the period of visit. According to their explanation it is usually considered to involve visits of more than 24 hours (but less than one year) for business or recreational purposes and has to be differentiated from shorter visits, known as excursions, whether these involve national or international journeys. Broadly, tourism is a phenomenon variably distributed in space; the location of destinations and markets, and the flow of people, capital, and ideas between the origins and destinations are at the core of the activity. Tourism influences the form, use, and protection of the landscape (Britton 1978). In the tourism literature Williams and Shaw (1995), Dawes and D'Elia (1995), Ioannides (1994, 1995), Leiper (1990) provide the principal definitions of tourism. Tourism can be divided into many different forms on the basis of length of stay, type of transport used, price paid or the number of travellers in the group. Boniface & Cooper (1987) defined *domestic tourism* as those travelling within their own country and *international tourism* as those travelling to a country other than that in which they normally live. Mainly another currency is used and people speak a different language. But this is not necessarily always true. Boniface and Cooper also differentiated tourism as either *long* or *short haul tourism.* Journeys generally taken over 3,000 kilometres classified as *long haul tourism* and below 3,000 kilometres as *short haul tourism.* Another form of tourism is classified as *holiday tourism* (5 *"s"* type : sun, sea, sand, shopping and sex) in which touring, sight-seeing and culture is included ; *common interest tourism* where as it has a purpose of visiting friends, and relatives, religion, health, or education reasons, and *business tourism*, those attending trade fairs and conferences, or participating in incentive travel schemes (Holloway 1983). Economic geographers ask the critical question whether tourism is a sector with wide economic, political and social ramification or not (Williams and Montari (1995). It is, for example, as much a form of production as it is of consumption, yet, national geographic bodies, such as the Institute of British Geographers' Economic Geography Study Group, or international geographic bodies such as the IGU's industrial activity commission, have largely ignored tourism, or even hospitality management, as a form of economic activity. Instead, much of the interest in tourism has flowed from cultural and transport geography. Being unbiased, there is a concession for tourism applied by most of the countries in the world and we believe it is rhetoric to ignore tourism.

There is much debate in the literature about leisure, recreation and tourism. The situation becomes more confused because of imprecise terminology. Therefore, there is a need for clarifying the meaning of each of these terms. Sometimes the word *tourism* is confused with *leisure* and *recreation. Leisure* is a measure of time and is usually used to mean the time left over after work, sleep, and personal and household chores have been completed. In other words, leisure is free for individuals to spend as they please. *Recreation* is normally taken to mean the variety of activities undertaken during leisure time. Basically, recreation refreshes a person's strength and spirit and can include activities as diverse as watching television, or holidaying abroad. If leisure is a measure of time, and recreation embraces the activities undertaken during that time, then tourism is a kind of activity. The only difference in terminology is recreation based either at home or close to home, or at the opposite extreme travel for tourism where some distance is involved and overnight accommodation may be needed.

4.1.2 The Definition of Tourist

Up until now we have explained tourism, but we have not mentioned anything about the "*tourist*" yet. Who is the tourist? There are many definitions available about tourists in the tourism literature.

The League of Nations in 1937 recommended that a *tourist* be defined as someone "who travels for a period of 24 hours or more in a country other than that in which he usually resides. The World Tourism Organisation (previously the International Union of Official Travel Organisations) have, through the UN Conference on International Travel and Tourism (1963), agreed the term "visitors" (Williams and Shaw 1994). This covers two main categories: *tourists* - temporary visitors staying for at least 24 hours, whose purpose could be defined as either leisure or business; and *excursionists* - temporary visitors staying less than 24 hours, including cruise ship travellers, but excluding travellers in transit. Such ideas have been greatly extended into the construction of more comprehensive and elaborate classifications that relate types of travellers with scale and purpose of journey. Within this perspective, many trips are multipurpose, involving a range of primary and secondary activities. In Cohen's (1972) initial study he recognised four main types, ranging from the organised mass tourist to the individual mass tourist, the explorer and the drifter. In addition, these groups were also differentiated along the lines of contact with the tourism industry, with mass tourists being termed "institutionalised" and the more individualistic tourists regarded as "non-institutionalised".

4.1.2.1 Cohen's (1972) Four -Types of Tourists

The *organised mass tourists* are the least adventurous tourists who, on buying their package holiday, remain encapsulated in an "environmental bubble", divorced from the host community as they remain primarily in the hotel complex. Trips not complex and are "organised tours" which are fixed by tour operators. Such tourists make few decisions about their holiday. The *individual mass tourists* are more or less similar to the organised mass tourist in which tour operators utilise all facilities but they have some control over their own itinerary. They may use the hotel as a base and hire a car for their own trips. However, many will tend to visit the same places as the mass organised tourist in that they will visit the "sight".

The *explorers* arrange their own trip and attempt to get off the beaten track. Yet they will still have recourse to comfortable tourist accommodation. However, much of their travel will be motivated by a wish to associate with local people, and they will often speak the language of the host community. Nonetheless, the explorers retain many of the basic routines of their own life style.

The *drifters* will shun contact with the tourist and tourist establishments, and will identify with the host community. They will live with the locals and adopt many of the practices of that community. Income is generated by working within the community, but often through low skilled work, which creates a tendency to mix with the lower socio-economic groups. Mass tourists are generally classified as *institutionalised* tourists and individual tourists are classified as *non-institutionalised* tourists. Institutionalised tourists are the ones who enjoy the environment, hotel and bus tours, whereas non-institutionalised tourists are the ones who are not interested in events. They are interested in the host culture. Cohen (1979) explained the typologies of tourists but, within this theoretical framework, he also tried to explain the psychological motivation of the tourist. Bastin (1984) summarised Cohen's five different modes of vacation such as; diversionary mode, recreational mode, experiential mode, experimental mode and existential mode. The *diversionary mode* is one in which individuals seek nothing more than an escape from the drudgery and meaninglessness of life in their home countries. The *recreational mode* involves people who wish to experience the host culture, but seek no participation and are content to see the location from tour buses and to view staged events.

The *experiential mode* introduces the idea of cultural validity by arguing that this particular type of traveller is alienated in his own society and is searching for meaning through the lives of others. The *experimental mode* refers to travellers who derive enjoyment and reassurance from others authentic lives, but do not fully commit themselves to the life style of the host culture.

The *existential mode* is that in which tourists have a strong sense of commitment to the host culture, and who alternate between their home residence and their chosen (spiritual) centre. Bastin (1984) implemented Cohen's vacational modes on Jamaica, in which Jamaican tourism is highly dependent on the USA and the growth of mass tourism since the Hotel Incentive Bill of 1968 is closely related with American tourist modes.

4.1.2.2 Plog's (1972) Categorization of Tourists

Plog (1972) argued that there was a continium between types of tourists such as; psychocentric, near psychocentric, midcentric, near allocentric and allocentric tourists. The allocentric is akin to Cohen's explorers in that they seek new destinations and are prepared to take risks in searching for new cultures and places. On the other hand, the psychocentric tourists seek the familiar, and are happier in an environment where there are many tourists who are like-minded. They are not risk-takers and adhere to the proven product, being conservative in choice. Plog identified that these types of tourists would be drawn to a particular destination.

Why do the tourist typology models remain useful? They remain useful for three main reasons :

1. They highlight the broad diversity of tourists, their demands and consumption,
2. They provide an insight into the motivations of tourists and their behaviour,
3. Such perspectives provide a platform from which to explore the relationships between tourist consumption and the socio-cultural fabric of destination areas.

4.2 Butler's (1980) Tourist Area Life Cycle Model

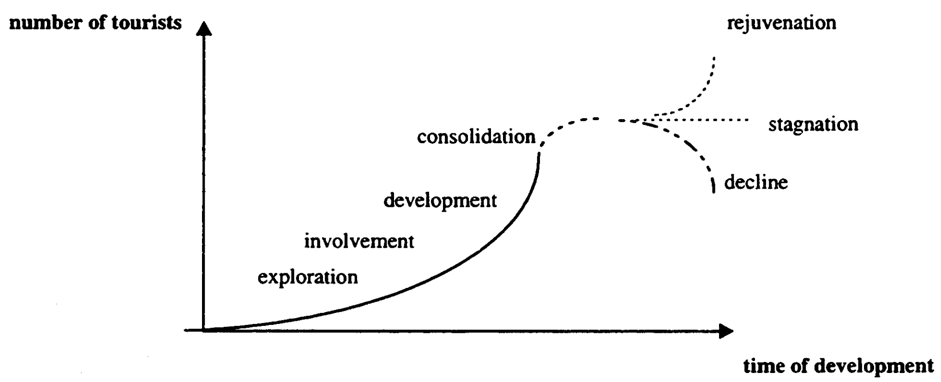


Fig - 4.1 Butlers Tourist Area Life Cycle Model
Source: Butler (1980)

Butler (1980) explained the tourist area life cycle in six different stages: exploration, involvement, development, consolidation, stagnation and decline. *Exploration* is the first stage in which there are a small number of visitors. Plog's allocentric or Cohen's explorer can be used as an example for this stage. The second one, the *involvement stage*, is the stage when the host community begins to respond to the increasing numbers of visitors by providing some facilities. In the later stages of the involvement stage, some of the host community might recognise that tourism will continue to grow and that, in order to earn more from it, they will have to expand the facilities being provided. They look for commercial sources of finance to provide more facilities. The next stage is the *development* stage. Butler then assumed that the process continues, and the numbers of tourists coming begin to grow quite significantly. He described this stage as being the one where the community now becomes a tourist resort. Plog's midcentric or Cohen's institutionalised tourist can be relevant with this stage. *Consolidation* is a stage of take-overs and mergers within the industry as the transport - leisure - accommodation company buy-outs occur. The tourists now being attracted are the "organised mass market" and the "psychocentrics".

Stagnation is not a "fashionable" stage. In order to sustain visitor numbers, the tour operators may have to resort to low prices to attract the volume of tourists that they consider necessary to sustain their investment. The last stage is the *decline* stage. It is the end stage. Profit margins fall and the number of tourists falls because it is more boring for the tourist, and they say that the tourist is looking for new destinations and differences which might be more attractive to them. Rejuvenation is necessary to discover the new alternatives for tourists. As long as we are studying tourism, then our product is a "package" - tour package, in which accommodation, transportation, attractions are included. When tourists buy a package, it means that they accept everything included in it. Therefore, rejuvenation is a kind of progressing stage, or innovation to create a new package, more attractive, noble to the holiday makers, in order to prevent reaching the decline stage.

The model proposed by Butler (1980) has attracted criticism, particularly failing to take into account changes on the demand and supply sides. Cooper (1990) argues that the life-cycle concept is extremely dependent on supply side factors, such as the rate of development, tourist access, government policy and competing resort areas, as well as demand factors. Haywood (1986) and Cooper (1990) also provided critiques of the difficulties of operationalising the model. Haywood, for example, suggests that there are six major conceptual and measurement decisions concerning the definition of: the areal unit of analysis, the relevant market areas, the shape of the curve, the resort's stage in the life-cycle, the unit of measurement (i.e. numbers of tourists, visitors, overnights, spend etc.), and finding the relevant time frame. He argues that until such issues are fully resolved, the model's applicability to strategy and forecasting is questionable.

Wolfe (1983) offered a similar approach to Butler's in that he more explicitly took environmental changes into account. He used a different curve, but he explained the same ideas. Butler's model is also tested positively by Meyer-Arendt (1987), Van Duijn (1983), also found this model deterministic. Keller (1987) also made a big contribution to Butler's (1980) Tourist Area Life-Cycle model with his Hierarchies of Control and Capital Input model. In his theory, he divided this cycle into four phases. It is possible to distinguish between first *Discovery*, second *Local Control*, third *Institutionalism* and fourth *Crisis Period.*

He argued that tourism development in a peripheral or disadvantaged region will start as a small-scale enterprise. The initial development will involve local entrepreneurs who recognise profit when satisfying the needs of a small group of explorers and drifters or allocentrics. For tourism growth, Keller classified stages as discovery, local, regional, national and international stages on a scale of development within a specified period. At the initial stage, which is the stage of discovery, only a negligible number of visitors are received and they are absorbed into the existing peripheral environment and infrastructure.

During Butler's (1980) involvement stage, which is akin to Cohen's (1972) allocentric and Plog's (1972) drifters, Keller (1987) said that visitor volume reaches a level beyond the capabilities and capacity of the local decision-making. National, foreign and multinational corporations may perceive the peripheral destination as a good investment opportunity and therefore enforce their presence on the regional and local planning structure in which the period is akin Cohen's consolidation stage. Keller specified the period in which control and decision making is influenced by foreign and multinational developers in the development stage of Butler's model, which is akin to Cohen's organised mass tourist (institutionalism is reached). Subject to national, foreign and multinational developers, the tourism industry is turned into a highly competitive, internationally marketed tourism destination. At this stage, it is not feasible for foreign and multinational corporations to take over the decision-making process through their powers of influence. Stage four, is the crisis period or the stage of stagnation/ rejuvenation. During this stage, exploitation and overcrowding of the peripheral destination will have led to a loss of the initial attraction of the region, a subsequent decline in reputation, and consequently a decline in demand. Increased input of further capital and infrastructure will yield little or no added return.

Butler notes three options open at this stage. One is to try and maintain the periphery's image at an established and attractive status quo. The second is to aim for a deliberate decline and ultimate deterioration of the industry, and thus to maximise what profit there remains in the short term. The third is to try to change or elaborate upon the existing image of the destination and to market it as a new product. For the applicability of the model, Keller pointed out that this model is no doubt theoretical and general in nature. It is certain that it will not explain the evolution of every peripheral tourist destination, but then this is not the essence of model development.

He applied this model to a case study of Canada and said that the tourism industry in the island's development is at, or beyond the stage of institutionalism. The objectives of the model are to demonstrate that different typologies of consumers, producers and regulating authorities are attracted to the peripheral development through time and that, while the development is compatible with the goals and objectives of some authorities and organisations, it involves major adaptations, impacts and change elsewhere down the hierarchy. Impacts will range from positive and constructive to negative and destructive, depending on the stage in the growth cycle, and who judges them. Attitudes and perceptions of impact will vary depending on the "judge's" attitude towards development and economic growth, and which hierarchy and interest group is represented.

As we mentioned, Butler's Hypothetical Tourist Area Life Cycle applied to Canadian Northwest territories and, Keller developed the cycle in an examination of centre/periphery tourism. On the other hand, Cooper and Jackson implemented Butler's (1980) model to the Isle of Man case study. Although the Isle of Man is separated from the mainland UK, it shares many of the characteristics of other UK resorts. Most resorts were products of the popular culture of the late Victorian and Edwardian periods and many now face similar problems of sustaining development.

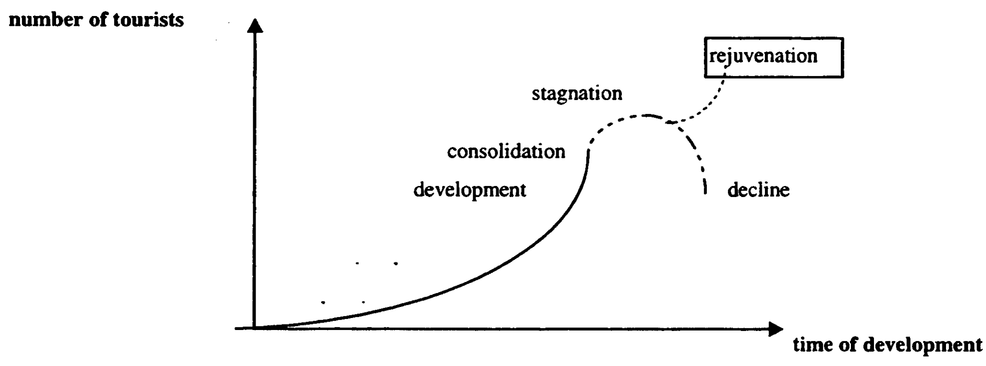


Fig. 4.2 The Isle of Man Tourist Area Cycle of Evolution
Source: Cooper and Jackson (1989)

The Isle of Man has been through all the principal stages and is currently facing the problem of stagnation (Figure 4.2) and it needs to determine strategies for rejuvenation in the 1990's (Cooper and Jackson 1985). The take-off into mass tourism development can be dated from the 1880s. Passenger arrivals at Douglas rose from about 90,000 in 1873 to 615,726 in 1913. The period in general was one of unprecedented growth and expansion in the island tourism industry (Birch 1964). Douglas was an important element in the regional pattern of holiday development. The pace of its expansion and the style of the resort were largely determined by the demands of this predominantly working class catchment. However, the changing nature of the tourist product was not simply a result of these pressures. Several agencies, including the Manx Government, the Isle of Man Steam Packet Company and the Douglas Corporation all responsible for encouraging specialisation in provision, as the potential returns from such action became increasingly evident from the rapid rise of other resorts (notably Blackpool) on the English mainland. Why did the Isle of Man not specialise as much as Blackpool? There are many reasons such as infrastructure investments, distance (transportation costs) for domestic tourists, the relative prices of small hotels on the island. The island has inherent problems which makes it difficult to compete with other tourist destinations, and tourism is likely to continue to decline in relative importance to the Island's economy. The demise of the traditional working class family holiday, and with it the whole infrastructure of dance halls and donkey rides has now partly been off-set by expansion in other areas, most notably the financial sector.

The biggest sector with 35% contribution to the Isle of Man's GDP. There is an apparent inevitability in the cycle of the Isle of Man's tourist development. Rapid expansion and over specialisation led in the long run to inbuilt restrictions on change and rejuvenation and hence eventual decline. But this can only be a partial explanation for the fortunes of the industry. The process of development was constantly influenced by agencies, operating within the framework of a free market economy, which determined the direction the industry followed. In particular, the interplay between the forces of demand and supply, in the late 19th century, had a profound effect on the character of the Isle of Man holiday product. There are some reasons why the Isle of Man was not appropriate for tourism, as much as Mediterranean islands, after the Second World War. These were as follows:

1. The Isle of Man's geographical situation made it expensive to reach, and it offers no day-trips,
2. The island is dependent on the British domestic long-holiday market,
3. It has failed to respond to changing market demands and effective competitive initiatives elsewhere.
4. Other reasons (e.g. cost, climate, facilities etc.)

By the 1980s, the Isle of Man had approached the decline stage of the tourist area life cycle; the catchment area was restricted and the characteristics of holiday visitors reflected the latter stages of the cycle. By 1986, there were 471,260 arrivals around representing a steady decrease since the peak of 763,145 in the year (1979). The rate of decline decreased significantly in the mid-1980s at a rate of around 2.5% per annum. After 1986, the number of passenger arrivals started to increase steadily and reached to 525,636 in 1990 from 471,260 in 1986. Because of the Gulf crisis, the Isle of Man was also affected by the recession and the number again fell to 485,874 in 1991 and 467,496 in 1992. But the Isle of Man tourist sector and Manx government had previous experience and they achieved above 500,000 after 1993.

According to the Isle of Man official figures in 1994, 513,287 passengers visited the island, 55% travelled by air and 45% by sea. They started developing coach tour services from England, Ireland, Scotland and Wales. This will increase the number of tourists visiting the IOM. It is less costly and more adventurous. Tours offers a wide variety of Island sightseeing tours, both full and half day which provide visitors with an opportunity to discover some of the island's rich heritage and natural beauty. For 1996 ABTA bonded tours (IOM) will provide a wide and varied program quality, value for money holidays with luxury coaches (IOM Courier, 26 Oct. 1995, p.20).

An insecure economic climate encourages late booking and little advance holiday preparation. Here, the added cost of air travel, or the effort of a sea crossing, placed the Isle of Man at a competitive disadvantage. Secondly, demographic trends have reduced demand for traditional family holidays as the number of children under 5 years of age declines (Middleton 1987). Moreover, with the competition from holiday destinations abroad, it is clear that the Isle of Man cannot compete on price or facilities in the mass market and must seek new areas of business. Consumer convenience goods in the Isle of Man are 10% higher than anywhere else on the UK mainland. Only the alcoholic drinks and tobacco prices were some 3.5% lower due to lower excise duties on the Island than in the UK. These goods are classified as luxury goods in general. Therefore, when tourists meet needs, especially basic needs, they will pay more on the IOM than anywhere else on the UK mainland. This makes the Isle of Man relatively less competitive than the other tourist destinations so it has a negative effect on the tourist potential. Apart from higher average price levels, the Isle of Man also experiences three further problems. These are as follows:

1. The range of unbranded (or "own-brand") goods, often sold by larger retail outlets at lower prices, is narrower on the Island than in Northwest England.
2. The availability of larger (and often better value to consumers) packet sizes of foodstuffs is more limited on the island.
3. Certain types of goods (e.g. chill-serve goods) are not as widely available on the island as in Northwest England.

Fuel for vehicles sold on the island is mainly four star leaded petrol (2% more expensive on the island), unleaded petrol (1% more expensive) and diesel (5% more expensive). Consequently all public transportation is relatively more expensive than anywhere else in the UK. Other disadvantages which the Isle of Man shares in common with other small islands is higher stockholding costs. Goods in stock can also deteriorate or go out of fashion. The island wholesalers, retailers and energy suppliers hold on average greater stocks than their mainland counterparts. The first reason are the dangers of interrupted shipments of goods (e.g. through bad weather or industrial disputes). The second reason is the need to import in economically sized consignments. This, together with the relatively small and fragmented nature of island demand means greater stocks must be held at any given point in time. Lastly, the desire to obtain bulk purchase discounts from suppliers or retail goods and energy suppliers. The Isle of Man has also failed to exploit economies of scale and it has restricted competition. Classic local monopoly conditions are still apparent on the Island.

4.2.1 Rejuvenation strategies for the Isle of Man tourism

We have summarised below ten rejuvenation strategies to overcome the tourism problems where the IOM is currently facing:

1. Marketing is the most important problem for the island's tourism. More effective marketing policies should be developed and advertising and promotion expenditures must be increased.
2. Bigger and attractive stands should be prepared at tourism fairs to attract more tourists in the world travel markets. The IOM has to be more competitive among rivals such as Channel Islands, Jersey and Guernsey.
3. The IOM Department of Tourism and Leisure must have closer relations with the private sector of the industry. A hoteliers, transport companies and restaurateurs consortium has to be developed in different countries. British Tourist Board and England's North Country consortium has to be more active with the IOM tourism department associations. In order to achieve this, more representative relations have to be developed and foreign relations must be strengthened.
4. Brochures published should be delivered to more agencies, and profit margin on package holiday brochures has to be increased.
5. The IOM's marketing budget covers so many activities. The marketing experts have key contacts mainly with the travel industry and media. In addition to consumer and trade activity, the Department operates the IOM Conference Bureau designed to attract corporate or association

meetings to the island. This should be expanded and other islands' (Malta, S.Cyprus etc.) experiences have to be considered.

6. The IOM's accommodation is registered and graded with crowns and keys. Crowns are used for full board service accommodation and keys are for self-catering accommodation including campsites and holiday hostels. The maintenance of standards and quality in providing services are very important issues. The Department of Tourism and Leisure should adopt high service standards designed to maintain a balance between first-time and repeat business.
7. Strengthening public relations is necessary for the island tourism development. The IOM's advertising campaigns in the UK and Ireland are designed to create positive awareness amongst key target groups. Elements within these campaigns include brochure distributing advertisements; magazine advertising to create and sustain awareness through the holiday decision-making period and subject to available finance, television advertising in key regions.
8. Like TT (Tourist Trophy) races and TT festivals which are held annually from late May into early June, other kinds of event should be organised to support tourism. Sporting events taking place in England might be transferred onto the island from time to time. More football fields and stadia should be constructed with all sorts of facilities and, during the break in the football season, many of the foreign teams from abroad could be invited to the island for the preparation of next season. The island weather is quite convenient for the Scandinavian, Mediterranean and other European football teams. This source of tourism is more beneficial because the average night length of stay is much higher than the others. The budget should be allocated to the other art related events as well as heritage events.
9. Air transport costs are relatively higher when compared with Mediterranean destinations. All necessary modernisation should be done on aircraft, and quality and frequency should be improved. More chartered flights must be organised and costs should be reduced. Charter

and day trip operations should be encouraged and supported. Further access to the island by coaches should be encouraged. Travel facilities should remain within the private sector.

10. Funds should be allocated on the basis of priorities. The environment has to be the first priority and all necessary investments must be carried out without any hesitation. Oil and gas exploration is taking place around the island with a possibility of pollution occurring while they are drilling the sea bed. Marine pollution is dangerous for the island coasts and the animals living on the island. The protection of the environment was given a particularly high priority because of all of the IOM acreage lies within 12 miles of its coast line. Licence conditions in this respect, which are based on the UK guidelines for inshore operations, are regarded as especially onerous (Financial Times, 15 Feb., 1996).

4.2.2 Environmental Problems And Sustainable Development In The IOM

> **We cannot afford to be complacent. The Manx countryside is changing for the worse. The natural heritage is the birthright of the Manx people and the government must protect it for the future generations. We must act now. Traa-di-loar (time enough) won't do (Hendry, 1995).**

Hendry (1995) has used strong words to argue that the IOM government must take the opportunity to sign the Rio Convention to show it is willing to work to protect the national heritage in the same way that it protects architectural heritage. Natural heritage is important for the economy, as many tourists visit the IOM to enjoy the countryside and wildlife, inland and at sea. He stressed that it can never be restored once lost, and is too important to be neglected. There is a campaign for recycling (e.g. scrap metal, waste engine oil, CFC gas from old refrigerators, glass bottles and jars, aluminium drink cans, newspaper, etc.) on the island. In 1989 over 2,700 tones of glass, more than 8,300 tones of paper and some 70 tones of aluminium cans have been exported for recycling. A subsidy is provided by the Department of Local Government and Environment for recycling and it costs more than £0.25m per year (IOM Courier, 26 Oct. 1995, p.68).The IOM parliament, Tynwald, has approved an integrated waste management strategy in 1994 (IOM Courier, 26 Oct. 1995, p.67), which is designed to encourage the reduction, reuse and recycling of waste and to provide an incinerator and associated landfill to dispose of the remaining refuse.The strategy confirms the Tynwald's (Department of Local Government and the Environment) commitment to provide the IOM inhabitants with:

- municipal incinerator plant, to be in operation by the end of the year 2000, which meets EU standards to prevent air pollution and is designed to recover and utilise energy when practical and economic;
- a landfill site for incinerator residues;
- within the incineration complex, a separate clinical waste incinerator along with facilities for fallen animals and for the witnessed destruction of confidential materials;
- facilities to appropriately support recycling efforts;
- civic amenity sites for the collection of household garden waste and bulk debris; and
- a facility to receive and handle wastes - such as industrial wastes - which require specialist disposal off the island.

And to encourage:

- development of uses for incinerator bottom ash in the building industry;
- the use of community recycling facilities; and
- re-use of as much construction waste as possible, with the remainder going to landfill (not one used for incinerator residues) for reclamation or for use as cover material.

Making laws and enforcing regulations to protect the environment is not sufficient. Education, particularly environmental education, has a significant part to play in helping citizens children, young people and adults from all walks of life to understand the principles of sustainable development and accept that development should lead to social equity, ecological sustainability and economic efficiency (Ventura, 1994). Educating Manx society on environmental issues will help to protect island's environment and preserve it for future generations. Environmental issues which will have an effect are considered to be as follows:

- Nature conservation zones,
- Sites of ecological importance for nature conservation,

- Manx nature reserves,
- Prevention of the pollution of the waters,
- Protection of coastal areas,
- Sewage treatment,
- The interests of the Manx Museum and National Trust.

4.3 The Development of North Cyprus Tourism

As a result of the political problems, North Cyprus does not enjoy full recognition in the international world, therefore, it has not passed from the first stage to subsequent stages as quickly as South Cyprus. Of course, this situation allowed the Turkish Cypriot market to decrease competition and South Cyprus enjoyed all the benefits of monopoly in the world market. The Product Life Cycle model could easily be applied to all kinds of industrial developments in which Gore (1994) explained as later economists Kojima's (1973) and Yamazawa's (1990) "the catching-up product-cycle pattern of industrial development". After the separation in 1974, there was the great loss in Famagusta, the island's largest resort, and most of the suburb of Varosha - which contained about 6,000 beds (out of 10,796) in hotels and hotel apartments and the main business district. That area was receiving more than 250,000 tourists annually (264,000 in 1973) from all over Europe. But after 1974, Varosha was abondoned as a "restricted zone" until both sides can find a bilateral and bizonal solution.

Lockhart (1994) emphasised that, while Ioannides (1992) was able to claim confidently that the Cyprus government has steered the South Cyprus' tourism industry towards the consolidation stage of Butler's (1980) model, assessment of North Cyprus' position is more difficult. On the one hand, elements of the *exploration* phase remain, such as the plethora of small-scale locally owned enterprises and the large number of visitors who make their own travel arrangements. On the other hand, there is much evidence, especially since the late 1980s, of new facilities for visitors, wider advertising and growing numbers of

What kind of preventative measures could be taken in order to overcome these shortcomings and shifting from one stage to another? Although tourism has not yet been fully studied, economic development, economic geography and tourism are related matters. Ioannides (1995) mentioned that the tourist industry cannot enhance its legitimacy as a subject for economic geographers until its theoretical underpinnings are strengthened. The Tourism Promotion Bill - 1987 - foresaw a five year development plan which laid emphasis on the expansion of external economic activities. Within this framework, tourism was to become the cornerstone of the economy and an all-out effort would be made to attract investments in the industry and related activities. Some of the incentives included in the Bill, such as: low land rents, import duty exemptions, tax rebates and provision for the repatriation of profits. Islands must also be able to provide infrastructure to support the tourist inflow. In some cases, tourism can actually produce the basic demand that makes it economic to provide a service to the local population.

Apart from air transport, other examples are roads and electricity supply. In other cases, however, lack of infrastructure facilities can prevent the development of industry. This is why North Cyprus tourism has not been developed enough, as Ioannides has explained. Preparing a Tourism Master Plan is the principal way to overcome the shortcomings of the economic problems. We simply argue that North Cyprus must prepare a tourism master plan in order to steer the tourism industry towards the consolidation stage of Butler's model from the development stage.

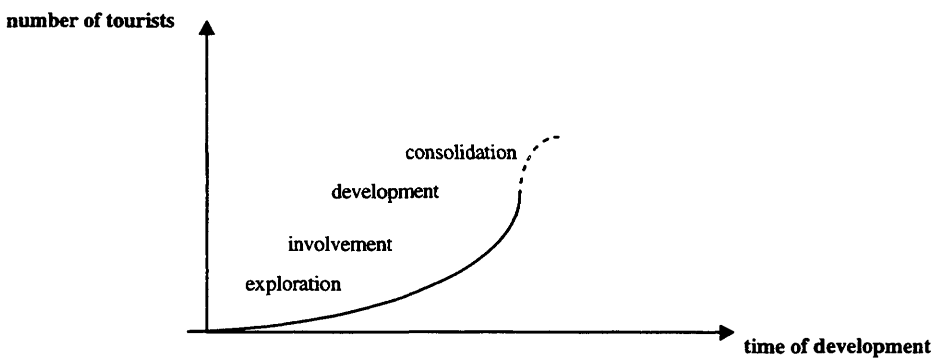


Fig. 4.3 North Cyprus Tourist Area Cycle of Evolution
Source: Yorucu and Basel (1995)

We believe that a master plan is the prerequisite for the social and economic success. Such a plan has never been prepared for North Cyprus to guide its tourism in an organised way. The master plan that we will propose, has been presented in an international conference in Malta, organised by the *Islands and Small States Institute of the Foundation for International Studies* in March 1996 and many of contributions were made by many experts who are working on the same field. Environment issues have not been taken into consideration and unstructured construction has polluted the natural scenery. Economic incentives have not been given for proper and feasible projects. The infrastructure has not been completed and relevant investment opportunities missed out from time to time. The governors always used the excuse of financial problems and defended themselves by having international embargoes. Yet, they employed so many people for the government services and caused perennial salary problems which are more than 50% of the annual budget of the government.

4.3.1 Tourism Master Plan

There are many definitions of tourism planning, but Getz (1992) defined it as a process, based on research and evaluation, which seeks to optimise the potential contribution of tourism to human welfare and environmental quality. In the literature you will find Murphy (1980), Hall (1970), Braddon (1982), and Acerenza (1985) who have written on tourism planning and explained the sources of plans such as:

1. General national plan.
2. National infrastructure plan.
3. National tourism development plan.
4. Tourism infrastructure plan.
5. National promotion and marketing plan.

These are all at national level. It is also possible to plan at the local level, regional level, inter-regional level, and sectoral level. The most appropriate master plan for

North Cyprus tourism which we found during our research is at regional level. The Isle of Man also planned on regional level and showed the priority for the undeveloped regions which was the potential for the economic and environment developments. Yorucu and Basel (1995) explained that five regional master plans for North Cyprus tourism could be the most appropriate for the environmental and economic developments. All infrastructure investments have to be completed with the policies which will be indicated in the master plan. The regions could be as follows:

1. Karpass Peninsula (Northeast Region).
2. Lefke & Yesilirmak (Northwest Region).
3. Kyrenia (Northern Region).
4. Famagusta & Salamis (Eastern Region).
5. Nicosia (Central Region).

Each region should be separated from other with a boundary and a separate map has to be drawn for each region. Every detail should be shown on the maps and a country physical plan must be composed with them. Finally, all master plans should be combined and integrated into as a single official Tourism Master Plan for North Cyprus. There should be intersectoral relations within the economy, related institutions and associations, municipalities and universities.

Demand analysis (which will be discussed in chapters 5 and 8) is always the first stage of a master plan. North Cyprus is currently having a supply constraint demand (we will use lagged dependent variable in demand estimation) and a master plan will contribute to overcoming the infrastructure shortcomings. The second stage should be the preparation stage. Socio-cultural, economic, environmental protection should be investigated and analysed. There should be a link between the World Tourism Organisation and other International Tourism Organisations to find out what kind of incentives and priorities are given and how are they distributed, what sort of directives they have and how do they adapt? Nation's advantage always stays second, but they work in a more efficient and specialised way to carry passengers to the resorts than government institutions. Indirect benefits for the other sectors of the economy are also high. The economic, social, cultural, political, and environmental targets should be defined in the master plan aiming to achieve the objectives set by the physical plan. These plans and targets should be controlled with a feedback system. The relevant actions and unavoidable interventions have to be taken whenever it is necessary. The third step should be the application stage. These can be such as :

1. Tourism destinations should be separated and classified with their qualities and characteristics. Those which are separated should be reserved and safeguarded. These can be as follows:
    - separating rural areas with their characteristic peculiarities,
    - establishing the areas which are predominantly for tourist use (tourist accommodation),
    - establishing coastal areas,
    - creating tourism development areas (gaining the unused zones),
    - fixing the tourist villages and small residential use,
    - organising footpaths and illustrating them on the tourism master plan map,
    - securing the areas defined by an ecological survey as nature conservation zones, nature reserves, and sites of ecological importance for conservation and clarifying them with the boundaries on the master plan map,
    - aggreeing the land covered by water and the land which will have future water supply capacity; all kinds of possibilities of pollution affecting the existing water supplies should be investigated and installed on the master plan map; new techniques should be developed for the desalinating existing water potential,
    - demonstrating all overhead high tension lines and electricity distribution networks, radio and television stations, etc., and illustrating them on the master plan map,
    - drawing all traffic roads on the tourism master plan map,

- featuring museums, historical values, and monuments on the master plan map,
- establishing all picnic areas, camping areas, forest and woodland areas and illustrating them on the master plan map,
- sketching sewerage and drainage lines on the master plan map,
- setting up the future development areas may be available for possible tourist accommodation construction and showing them on the master plan map,
- showing open public spaces on the master plan map,
- establishing and illustrating both existing and future game, and sporting facilities areas on the master plan map,
- creating the leisure purpose areas (e.g. festival areas, fair centres etc.),
- showing the Yesilirmak-Gemikonagi railway on the master plan map,
- showing all airports on the master plan map,
- showing harbours and marinas on the master plan map,
- showing all public beaches on the master plan map,
- showing birdwatching hides both for ornithologists or 'twitchers' and drawing them on the master plan,
- showing all rivers, canals, dams on the master plan,
- showing all existing zoos on the master plan map, and
- others.

2. Those tourism areas mentioned above under section 1, should only be used for tourism purposes. All kind of tourism differentiation that we thought has to be applied for tourism services by the master plan.

4.3.2 Policy and Standards of Development

4.3.2.1 Intersectoral Relations

In order to develop and expand tourism there should be a close link between sectors of the state. The tourism master plan can only be applied if close relations can be established with all the sectors to prepare the strategies and standards. These sectors are as follows:

- Ministry of Education,
- Ministry of Agriculture, Energy and Natural Resources,
- Ministry of Interior,
- Ministry of Transportation,
- Ministry of Youth, Sport and Environment,
- Ministry of Foreign Affairs,
- Municipalities and Local Authorities, and
- Universities and High Schools.

4.3.2.2 Tourism promotion and marketing policies

All sources of promotion for North Cyprus tourism should be carried out and, within this framework, the promotion and marketing strategies must be indicated in the tourism master plan. Technology is part of daily life. All kind of information is available through a network system. Much of this information could be allocated more efficiently and less costlessly all over the world through internet. Advertising should be enlarged and a more effective advert policy has to be applied.

4.3.2.3 Transportation

Transportation should be restructured within the tourism master plan, and both domestic and international transportation has to be renewed. Aiming new transportation policies through foreign investments will solve serious problems, and with the support of technology and finance, a more positive era will start in the transportation sector. Long delays in air transportation has to be eliminated through the acquisition of new aircraft. Public transportation from airports to the cities ought to be expanded.

4.3.2.4 Communication

Information technology on tourism is essential and inevitable. Communication has to be modernised within the master plan and more communication facilities must be provided with the relevant standards. More alternative calling preferences can be given with a single phone machines (e.g., with credit card, coinage, phone cards, swift cards etc.). The postal system must be more frequent and daily. Tourist information offices have to be expanded to the whole cities and villages. Inquiry lines ought to be on duty in 24 hours a day.

4.3.2.5 Education

More attractive education policies should be established by taking the targeted number of tourists and the amount of accommodation into account which will be put into the master plan. This should be renewed periodically with the inquiries of the sector. More skilful personnel (waiters, chefs, receptionists, clerks, porters.) must be trained, educated and expanded. Tourism college education has to be enlarged and more financial supports should be given. The hotel management school should expand for the standard and ordinary level of employees that will be indicated in the master plan.

4.3.2.6 Environment

Tourism as we regarded before is the locomotive sector in the growth of North Cyprus. Although UNDP noted that environmental issues need to be taken into account in designing the future of tourism in North Cyprus, we need to clarify that the tourism master plan has to be prepared whilst considering the threat of tourism to the environment. The first priority must be given to the coastline which is 240 miles (387 km) in length. Ribbon development of the coast would destroy biological and scenic diversity and threaten the coastal ecosystem. All sources of industrial construction, domestic buildings and tourism have to be regulated with a master plan. The turtle beaches (Alagadi and Altinkum) should be protected and conserved as natural reserves. The question of the creation of a national park in the Karpass Peninsula will be addressed with the careful attention of the environmental aspects. This will be harmonised and regulated with the master plan. All agricultural lands and rural landscapes will also be included as environmental care issues in the master plan. All kinds of prevention to protect forests from fire must be taken within a master plan.

Damage to one ecosystem gives rise to reverberating effects in "downstream" ecosystems. For example, on some islands, removal of forest cover has resulted in declining land and water fauna, increasing soil erosion and sedimentation, and consequent adverse impacts on estuarine and marine resources. Pollution of the sea will always be under the control of the specialists and has to be governed by the Environment Ministry. All sources of wastes and agrochemical coming from the coasts of Egypt, Israel, Lebanon, and Syria are threatening Cyprus' coast, so with the help of Greenpeace all necessary notes will be given. Sewerage systems linked to the sea will be investigated and cancelled by developing new treatment systems. The tourism master plan will also regulate the architectural pollution. The greatest possible harmonisation will be given to the environment through the master plan. All municipal control has to be done on a routine basis and new constructions must involve certain high limits.

The investors have to ascertain all environmental restraints before starting their investment. Monuments and architectural buildings should be restored with their historical originity. Increasing population in North Cyprus causes energy and water shortages in which these sources are scarce as being a small island and having limited resources. Another electricity power supply must be constructed with minimal cost energy inputs and additional water dams for an increasing demand for consumption. Turkish Cypriots recently started to construct a new water dams in Yesilirmak (Limniti - Northwest region) area and hoping to collect more rainwater which was flowing into the sea and wasted. All streets and roads should be cleaned daily and all paintings including trees ought to be done periodically. A new lightning system must be provided and a brighter environment should be created.

Another important issue which has to be taken into consideration is the marinas. Recently the N. Cyprus government decided to privatise the Kyrenia Marina. Privatising Kyrenia Marina is on the governments' agenda, however, the project was required to increase the number of existing yacht capacity to seven hundred yachts that it needs another extension to the existing historical breakwater. Yorucu and Basel (1996) strongly criticised this project and are against the policy which will harm the architectural and historical value which does not coincide with environmental ethics. An alternative idea which would be environmentally acceptable is to open new canals for the extra yachts around the Kyrenia Marina. A similar example is available at the Peel Marina in the Isle of Man, or it might be possible to built another marina somewhere which is more convenient.

4.4 Conclusion

The concept of a recognisable cycle in the evolution of tourism is presented, using a basic asymptotic *S-curve* to illustrate the waving and waning of popularity. The implications of using this model in the planning and management of tourist resources have been discussed in the light of a continuing decline in environmental quality and hence, the attractiveness of many tourist areas. The shape of the curve will vary depending upon supply factors such as the rate of development, access, government policy, and competing destinations; and on the demand factors such as the changing nature of clientele as the destination's market evolves hand in hand with supply-side developments. At the same time, of course, the shape of the curve must be expected to vary for different areas, reflecting variations in such factors as rate of development, numbers of visitors, accessibility, governmental policies, and numbers of similar competing areas.

The process illustrated in Fig 4.1 has two axes representing the number of visitors and the time. An increase in either direction implies a general reduction in overall quality and attractiveness after capacity levels are reached. Geographical scale is also important for the tourist area life cycle as each country is a mosaic of resorts and tourist areas (which in turn contain life cycles for hotels, theme parks, etc.). The tourist life cycle is a hypothetical development path dependent upon marketing and managerial actions, rather than independent mechanical process. The model may also be best utilised in descriptive rather than a prescriptive capacity as a rational framework for studying the evolution of tourist destinations through time, taking into account their "complex economic, social and cultural environments". The model has some strengths as well as some weaknesses in terms of implementation. These are briefly defined by Levitt (1965), Haywood (1986), Meyer-Arendt (1987), France (1994), Pearce (1987), Wilkinson (1990), Cooper and Jackson (1989), Debbage (1990), van Duijn (1983) and Wolfe (1983) such as follows:

Strengths:

- it helps to develop and evaluate marketing strategy,
- it helps to sustain large numbers of visitors and profitability,
- it allows consolidation of market share and search for new markets,
- it helps to analyse the patterns of tourism development, and
- it provides a useful conceptual framework within which to study various forms of land-use intensification and environmental improvement and degradation.

Weaknesses:

- it does not fit the evolution of every peripheral destination and not all areas experience the stages of the life cycle as clearly as others,
- obtaining historical quantifiable data for testing the hypothesis and modelling the curve for specific areas are not always possible; more than thirty or forty years' data are necessary to prepare the model and substantiate the general arguments,
- the model is dependent upon the actions of managers as well as the competitive, cultural, social and economic settings of the destination,
- the existence of anomalies can complicate the situation,
- rapidly changing supply and demand factors brings a distorted and scalloped shape to the *S-curve* of Butler's tourist area life cycle,

- using tourist arrivals for describing the cycle is not always accurate because decline in the number of tourists does not always demonstrate that the destination enters into a decline stage because, in rare cases fewer, high spending individuals may replace a larger number of low-spending package tourists,
- in most cases the resort cycle ignores the effect of seasonal variations and the fact that at different times of the year the destination may appeal to different market segments,
- economic variables such as tourist expenditures may also be misleading if used for describing a destinations' resort cycle,
- the model has focused on internal dynamics of specific resorts, thereby ignoring both the structure of the tourism industry and the competition from other resorts,
- the model assumes a false universalism, and that this is maintained only by failing to take into account differences in the competitive positions or resources of different resorts, and
- the model is culturally and politically specific and, for example, seems inappropriate for application to developing countries.

All in all, with strengths and weaknesses, we believe that Butler's life cycle model is an intellectual discovery and should be seriously discussed for measuring the economic and environmental effects of every tourist destinations.

Ch 5 : The Theory Of Demand

5.1 Introduction

Demand theories explain the reasons behind both the development and the intensity of tourism flows between countries. Also *tourism demand* represents the quantity of goods and services that consumers require at a given moment. It is a direct function of per capita income as well as the population's interest in international tourism. Trends in the number of holidays taken and the percentage of total holidays taken abroad are international tourism indicators.

The theory of demand describes the international specialization of countries with respect to internal, regional and international demand. Vellas and Becherel (1995) emphasised that different levels of demand describe various characteristics in the development of international tourism, notably, tourism exchanges between similar countries of high economic development. The theory of demand was formulated by Linder (1961). He noticed that the difference in the levels of factor endowments between countries did not always reflect international exchanges. Indeed, the greatest number of exchanges are often between economies which have similar factors. For instance, in Europe, the most important tourism exchanges are between neighboring countries. This observation led Linder to reject the theory of factor endowments and to develop a new theory of international exchanges based on interior demand or representative demand.

According to Linder (1961), the level of international specialisation of a country is related to the level of *domestic demand.* In the main tourist-receptor countries (France, the United States, Canada, Germany, Switzerland and the United Kingdom), international tourism demand complements a domestic demand which is high. In fact, the development of international tourism is a result of conditions created by domestic demand. A country's comparative advantage stems from the quality of its infrastructure and superstructure and also from its tourism know-how, its level of technology and its favourable environment. Therefore, the volume of international tourism will be higher between countries which have similar domestic tourism structures.

Several forms of tourism can be distinguished for a given country: "domestic" tourism involves residents of this country travelling only within this country; "inbound" tourism involves non-residents crossing international frontiers to travel in the given country; and "outbound" tourism involves residents of the given country crossing international frontiers to travel in another country. Archer (1976)said inbound and outbound tourism together comprise "international" tourism. The main aim of this chapter is to explain the international tourism demand model and to define the methodology that will be used in chapter 8 of the estimate of demand regressions for the North Cyprus tourism demand as well as the Isle of Man, UK, Turkey, Malta, and Austria. Archer (1976) emphasised that in economic terms *demand* can be defined as the quantity of a commodity or service which a community is willing and able to buy during a given time period.

Tourism demand functions embody the relationship between the demand for international tourism and those factors that influence this demand. When estimated this economic relationship permits the impact of each of these factors on tourism demand to be identified. Witt, Brooke and Buckley (1995) stressed that the group of variables which influences international tourism demand will depend upon the purpose of visit taken. The demand for business travel will depend upon where major business centres are located, whereas the demand for visits to friends and relatives will depend upon where close historical and cultural ties exist, which give rise to the location of friends/relatives in foreign countries. As by far the majority of international tourist trips take place for holiday purposes, and it is only for holiday trips that individuals are completely free to choose the destination, transport mode, and so on. In the case of North Cyprus, most of the trips are taking place for a holiday purpose due to the fact that Cyprus has good sand, sea, sun combination. There are two transport modes to the island either by air or by sea. Most of the trips are made by air and mainly from Turkey. Yet, there are connections to the north of the island from London, Finland, France, Germany, Austria, Israel and some others via Turkey.

Crouch (1994a) pointed out that the growth in the study of international tourism demand parallels the growth in demand itself over the past three decades. An extensive effort was made to collect as many empirical studies of international tourism demand as could be found. In total, eighty studies were identified. No empirical study of the determinants of international tourism demand was found for the period prior to the 1960s. However, during the three decades since, a total of 5 (1960s), 33 (1970s), and 42 (1980s) useful empirical studies were obtained. An additional five studies reported since 1990 were also identified. We are sure a countless number of studies will be published in the near future.

The earliest meaningful study located was therefore that of Guthrie (1961), entitled *Demand for Tourists' Goods and Services in a World Market.* Other early pioneers in the field include Jud (1971), Artus (1972), Bechdolt (1973), Edwards (1976, 1979), Uysal (1983), Anastasopoulos (1984, 1989), Edwards (1985a, 1985b), Uysal and O'Leary (1986), Martin (1987), Witt and Martin (1987), Gonzales and Moral (1995), Kulendran (1996), Bonham and Gangnes (1996), Kulendran and King (1997), Sinclair and Stabler (1997), and Akis (1998).

5.2 The Methodology Used

Even though the methodologies employed vary in a number of ways, they all include the most important methodological dimensions : the nature of the demand coefficient estimation method, the functional form of the model, the type of data used, the adaptation of either a single or a simultaneous equation approach, and the ways in which multicollinearity and serial correlation were managed.

Of all existing methodologies, ordinary least-squares (OLS) multivariable regression analysis has been most widely used. Its advantages include the ability to model cause and effect, to carry out "what if" forecasting, and to provide statistical measures of accuracy and significance. However, Witt and Martin (1989) underlined that regression analyses may be inappropriate in certain cases and are generally more expensive than noncausal models. Econometric forecasting also needs considerable user understanding in order to develop the correct relationships. Although there is much criticism of the demand regression through OLS, we have decided to estimate the international tourism demand model with the OLS technique with a time series data. Crouch (1994) summarised the critiques and comments on this issue and made a list of different methodologies already applied by many of the researchers and practitioners who are related with tourism demand models.

Regression modelling has generally been of three types. Econometric models focus on an analysis of the impact of economic influences on demand. Gravity models adopt a geographic perspective with an emphasis on mass (i.e., population) and distance considerations. Trip generation models are a hybrid of the other two models. The three types differ more in terms of origin than of method, with gravity models being expressed in a more rigid form (Archer 1980, Anastasopoulos 1984).

Intriligator (1978) explained three sources of data analysis which can be used for demand estimates. These are :

1. Time-series data,
2. Cross-section data,
3. Panel data.

Time-series data measure a particular variable during successive time periods on different dates. The time period is often a year (i.e. annual data), but it can be a quarter, a month, or a week (i.e., quarterly, monthly, or weekly data).

Cross-section data measure a particular variable at a given time for different entities. Just as the "time period" can assume different values in time-series data, the "entity" can assume different identities in cross-section data.

Panel data are generally *microdata* pertaining to individual economic agents, such as families or firms. Most of the data available for econometric research is, however, *macrodata,* pertaining to aggregates of individual agents. Microdata are generally preferable to macrodata since they avoid aggregation problems and allow one to estimate models containing behavioural relations applicable to individual agents.

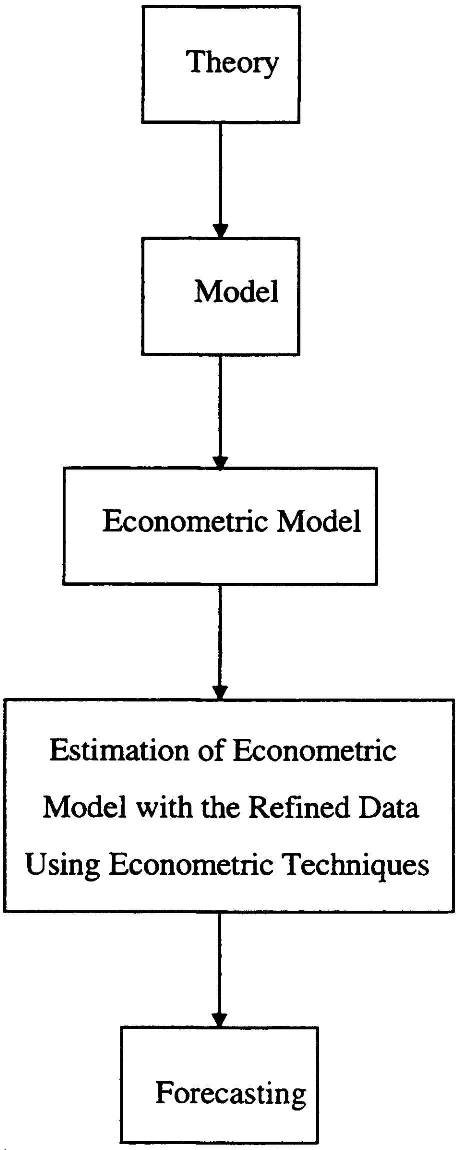


Figure 5.1 The Econometric Approach

Source: Intriligator (1978)

The most commonly specified mathematical form for international tourism demand functions is log linear. Witt and Moutinho (1994) have expressed the multiplicative relationship as follows :

$$Y = aX_1^{b_1} X_2^{b_2} \dots X_k^{b_k} e^u \qquad (1)$$

where

Y is the demand for international tourism

$X_1,\dots,X_k$ are the influencing variables

u is a random error term

$a_1 b_1,\dots,b_k$ are parameters

$e \cong 2.178$ is the base of natural logarithms.

In order to render equation (1) amenable to estimate using the usual technique of ordinary least squares, it is necessary to take logarithms of the variables (to the base e), which yields an equation which is linear in the natural logs (ln) of the variables:

$$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + \dots + b_k \ln X_k + u \qquad (2)$$

An ordinary least squares regression of ln Y on ln X_1,...,ln X_k yields estimates of the parameters b_1, b_2,...b_k in equations (1) and (2).

The log linear transformation is often employed because the multiplicative model (1) corresponds to the assumption of constant elasticity. The derivative of Y with respect to X_1 in equation (1) yields:

$$\begin{aligned} \partial Y / \partial X_1 &= ab_1 X_1^{b_1} X_2^{b_2} \dots X_k^{b_k} e^u \\ &= b_1 (aX_1^{b_1 - 1} X_2^{b_2} \dots X_k^{b_k} e^u) / X_1 \\ &= b_1 Y / X_1 \end{aligned} \qquad (3)$$

But the elasticity of Y with respect to X_1 is defined as:

$$q_{YX_1} = \partial Y / \partial X_1 . X_1 / Y \qquad (4)$$

Substitution of equation (3) into equation (4) gives

$$q_{YX_1} = b_1 \qquad (5)$$

Hence, b_1 is the constant elasticity of Y with respect to X_1, and in general b_j is the constant elasticity of Y with respect to X_j, j=1,2,...,k.

Consider the following demand function:

$$Y = aX_1^{b_1} X_2^{b_2} X_3^{b_3} e^u \quad (6)$$

where

Y is the demand for foreign holidays from a given origin to a given destination

X_1 is origin country consumers' disposable income

X_2 is the price of a foreign holiday to the destination

X_3 is the price of a foreign holiday to a substitute destination

In equation (6) the parameters b_1, b_2, and b_3 may be interpreted as elasticities; hence, b_1 is the income elasticity of demand, b_2 is the own-price elasticity of demand, and b_3 is a cross-price elasticity of demand.

If equation (2) is extended to include dummy variables in the set of influencing variables, the new equation becomes:

$$\ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + \ldots + b_k \ln X_k + b_{k+1} X_{k+1} + \ldots + b_q X_q + u \quad (7)$$

where

$X_{k+1}, \ldots, X_q$ are dummy variables

$b_{k+1}, \ldots, b_q$ are parameters

As the relationship between the dependent and dummy variables is no longer double logarithmic, the coefficients of the dummy variables are interpreted differently- they are *not* elasticities.

5.3 The Model

The econometric model which Witt and Martin (1987a) developed for the international tourism demand is explained below in logarithmic form. We will modify Witt and Martin's (1987a) model and implement it in our study.

Using an econometric model to estimate tourism demand is very important for this study because, we are interested in seeing group of variables which influences international tourist arrivals from an origin country to a destination country. Demand estimation is important for tourism of Cyprus. Since we are dealing with small island states, especially N. Cyprus, it may be important to select a regression model that will show the effect of supply constraints demand situation. North Cyprus is facing insufficient bed spaces, airline transportation, infrastructure etc. Therefore, a model including lagged dependent variable is inevitable which is expected to pick up the changes in supply constraint situation. From our survey, we found Witt and Martin (1987a) tourism demand model suitable for our study.

Uysal and Crompton (1984) emphasised that income, relative prices, exchange rates and transport costs are important for a tourism demand model. These are the most important parameters which influences tourist arrivals. The larger the real per capita income of a country, the more likely are its citizens to be able to afford to purchase foreign tourism, all things being equal. The effect of relative prices has been suggested an important variable in explaining international tourism flows. There is a contention that tourists are likely to react when there is a change in the ratio between prices in the exporting country to prices in the receiving country or prices in alternative tourist destinations. Nevertheless, as relative prices decline, an increase in the quantity of international tourism services imported by tourist-generating country should be anticipated, ceteris paribus. Exchange rate may have a significance effect on the extent of international travel. The price of foreign currency will influence tourists. Thus, if the price of foreign currency declines, tourists are likely to demand more services. International tourism is also dependent upon transportation costs. It may be anticipated that an increase in relative transportation costs would result in a decline in international tourism, all things stays the same.

The modifications we intended to do in Witt and Martin's (1987) model is to include income per capita as an explanatory variable rather than disposable income because of the lack of availability of quarterly data. We excluded substitute variables from the original model either due to potential multicollinearity problems or the lack of data availability. Another important modifications we made in our model is to exclude ferry fares variable since we face the lack of data from many countries. Lastly, we aimed to use quarterly data rather than annually for 1976-1995 period and also included seasonal dummies in our regression model. No such a long run quarterly study has been done on particular countries we are concerning therefore, ours will be new contribution for the literature.

We will first estimate demand with OLS and then use cointegration analysis to see long-run equilibrium relationships. Last of all, we will also make demand forecasting and try to find out the most accurate forecasting technique. All empirical study will take place in chapter 7.

$$\ln\frac{V_{ijt}}{P_{it}} = \alpha_1 + \alpha_2 \ln\frac{IN_{it}}{P_{it}} + \alpha_3 \ln Cl_{jt} + \alpha_4 \ln EX_{ijt} + \alpha_5 \ln FF_{ijt} + \alpha_6 \ln S_{ijt} + \alpha_7 D_2 + \alpha_8 D_3 + \alpha_9 D_4 + \alpha_{10} DM_1 + \alpha_{11} DM_2 + \alpha_{12} \ln (V_{ij(t-4)}/P_{i(t-4)}) + \alpha_{13} (t) + U_{ijt}$$

V_{ijt} = is the number of visits from origin i to destination j in year t

P_{it} = is the origin i population in year t

IN_{it} = is the real national income in origin i in year t

CL_{it} = is the cost of living for tourists in destination j in year t (1976 prices)

EX_{ijt} = is the rate of exchange between the currencies of origin i and destination j in year t

FF_{ijt} = is the cost of air fares from origin i to destination j in year t (1976 prices)

S_{ijt} = is the cost of surface transportation from origin i to destination j in year t (1976 prices)

D_2 = is a seasonal dummy variable which picks up the effects of the second quarter of each year (if t = Q_2 = 1 or 0 otherwise)

D_3 = is a seasonal dummy variable which picks up the effects of the third quarter of each year (if t = Q_3 = 1 or 0 otherwise)

D_4 = is a seasonal dummy variable which picks up the effects of the fourth quarter of each year (if t = Q_4 = 1 or 0 otherwise)

DM = is a dummy variable which picks up the effects of the economic, sociologic or political crises (e.g. 1979 oil shock, 1986 economic recession, 1991 Gulf crisis, etc.)

t = is a trend variable

$\ln(V_{ij(t-4)}/P_{i(t-4)})$ is a lagged dependent variable term

U_{ijt} = is the random disturbance term

$\alpha_1, \alpha_2, \ldots \alpha_{13}$ = are unknown parameters

Ong (1995) pointed out that most tourism demand models are based on multiple regression analysis. The models could be specified in a Cobb-Douglas, linear or log linear form. A log linear model is commonly used, but there is no discussion in the literature as to why such a model is superior at explaining variations in the dependent variable of tourism demand models. Most authors cite computational convenience and the ease of interpretation of the parameters as constant elasticities for choosing the log - linear model, but such reasons are not adequate justifications for preferring the log - linear form (McAleer, 1994). On the other hand, Syriopoulos (1995) has emphasised that there is a new approach to studying tourism demand, concerning major tourist origin and destination countries. A flexible, dynamic econometric model, disaggregated on a country-to-country basis, contributes, on the one hand, to rigorous examination of the impact - in the short run and long run - of major variables anticipated to affect tourism demand, such as income, prices, exchange rates and unpredicted shocks in the international environment (political instability, oil price changes) and, on the other hand, to estimation of both short run and long run elasticity values. The tourist arrivals, tourism receipts/expenditure, tourist nights and tourist trips were used as a measure of tourism demand.

Ong (1995) also underlined that tourism research typically uses tourists' expenditures, tourist arrivals or total tourist arrivals per capita as the dependent variable to estimate international tourism demand. He continued in a way that the use of tourist arrival figures does not need to account for tourists' length of stay. However, information on the average length of stay in a country can be useful for policy makers in tourism -related industries for investment and marketing purposes.

Witt and Witt (1992, 1995) also agreed that the demand for international tourism is measured in terms of the number of holiday visits from an origin country to a foreign destination country, or in terms of holiday expenditures by visitors from the origin country in the destination country.

As the level of foreign tourism from a given origin is expected to depend upon the origin population (the higher the number of people resident in a country, the higher the number of trips taken abroad, *ceteris paribus*), the demand variable is usually expressed in per capita form. Occasionally, however, population features as a separate explanatory variable rather than demand being expressed in per capita form.

Another comment on the dependent variable was made by Archer (1976) that some researchers, notably Blackwell (1970), Bechdolt (1973), Jud and Joseph (1974) and Leaming and De Gennaro (1974), used the actual number of travellers as a measure of existing demand, but the majority preferred to use visitor expenditure figures as a surrogate for tourism demand.

Most researchers experienced considerable difficulty in isolating the numbers or expenditures of pleasure travellers from those of businessmen and visitors travelling for other purposes and, in practice, few made any attempt to disaggregate these figures. In most cases, the tourism expenditure data are taken directly from national balance of payments figures or from the International Monetary Fund's *Balance of Payments Yearbook*; yet these data seriously undercount the true figures since the transportation sector of the accounts omits all payments made by visitors for shipping, insurance, currency exchange and commissions, and air travel in advance of their journeys. Few researchers, however, make any serious attempt to correct for this source of error. Bond and Ladman (1972), Gray (1966), Guthrie (1961), and Oliver (1971) used, as the dependent variable, crude tourism expenditure figures adjusted to an appropriate base year. Others, including Artus (1970), Barry and O'Hagan (1972), Jud and Joseph (1974), and Kwack (1972), deflated the expenditure figures still further by use of consumer price indices to represent the changing price levels faced by tourists in the countries which they visited. This provides a more effective measure of the real value of tourism expenditure.

5.4 Specification Of The Model

5.4.1 Dependent Variables

The number of holiday visits from an origin country to a foreign destination country will be the dependent variable for the model. We will measure the demand for international tourism in terms of the number of visits per capita from an origin country to a destination country.

In the tourism literature number of tourist visits and tourism expenditures are used as dependent variables in tourism demand estimation. Among many studies, number of tourist arrivals are the most commonly used ones. Witt and Martin's (1987) tourism demand model is the most commonly used one by many researchers and practitioners when number of tourist visit estimation becomes preferable.

Tourism expenditure as a dependent variable is estimated by Uysal and Crompton (1984) which is the selected one that is related with the determinants of demand for international tourist flows to Turkey. The paper looks at the theoretical justification for the inclusion of explanatory variables per capita income, relative price index, relative exchange rate, and promotional expenditure in an econometric model to explain major tourist-generating countries (i.e. FR Germany, the USA, France, Italy, the UK and Greece) expenditure in Turkey.

We did not choose expenditures as a dependent variable because of the lack of data availability for quarterly basis by many countries.

5.4.2 Independent Variables

The number of potential demand determinants is large. The selection of appropriate variables will depend on a number of factors, including the countries examined, the time-period investigated, whether a time-series or cross-sectional study is to be attempted, and the type of tourism involved (e.g., business travel, "sunlast" or "wanderlust" pleasure travel, travel for the purpose of visiting friends and relatives). Archer (1976) pointed out that the explanatory variables most commonly used were income levels, relative prices and travel costs. Other variables included in some studies were marketing expenditure, "border" travel and credit restrictions. In one case, population size was included as a separate explanatory variable, but most researchers avoided its use by expressing that the other variables were relevant in *per capita* terms.

5.4.2.1 Income

In most studies, the *income variable* which possesses the most significant explanatory power is expressed as *disposable income per capita* at constant prices. This measure was used, for example, by Artus (1970), Barry and O'Hagan (1972),

Blackwell (1970), Bond and Ladman (1972), Gray (1966), Kwack (1972), and Witt and Martin (1987). Jud and Joseph (1974), however, used an index of Gross National Product in one series of regressions and disposable income *per capita* deflated by the consumer price index in a later series. Oliver (1971) examined several possible measures of income and found that disposable income gave the most satisfactory results. Witt, Brooke and Buckley (1995) emphasised that income is usually included in the model as origin country real income per capita (corresponding to the specification of demand in per capita terms). As holiday visits are under consideration, the appropriate form of the variable is personal disposable income. Witt and Witt (1995) clarified that if (mainly) holiday visits or visits to friends and relatives are under consideration then the appropriate form of the variable is private consumption or personal disposable income, but even if attention focuses on business visits (or they form an important part of the total), then a more general income variable (such as national income) should be used.

Ong (1995) also stressed that the estimation results obtained by various authors show that tourism demand is income elastic, with estimations ranging from 1.0 to greater than 3.4 (see Gunadhi and Chow (1986) and Syriopoulos (1989). Tourism demand can be income inelastic for some destinations in the short run. In the long run, tourism demand is always elastic. Because of data deficiencies we are obliged to interpolate annual series into quarterly series. Some countries have annual GNP and some annual GDP. Therefore interpolation is implemented on both series. The interpolated series are adjusted with population, and quarterly income per capita figures are used as a proxy for disposable personal income.

Income data are generated from GDP per capita figures but not all countries publish quarterly GDP per capita figures. IFS monthly statistics sources are used for the income data collection, but for countries where quarterly data are not available we used interpolation techniques. Briefly, we used Vangrevelinghe's (1966) two step interpolation process (see Ginsburgh 1973 for details) and Boot, Feibes and Lisman (1967) for minimising squared first or second differences techniques.

We obtained additional annual actual export series and quarterly actual export series (as related series) from the same IFS sources. We also used the OECD statistics yearbooks for export and GDP per capita data for comparison purposes.

x_i^* = annual actual series (as related series) (published in IFS)

$\hat{x}_j$ = quarterly estimated export series (related series to be founded)

x_j = quarterly actual export series (published in IFS as related series)

Y_j^* = annual actual GDP series (published in IFS - used for regression and slope)

$\hat{Y}_j$ = quarterly estimated GDP series (to be interpolated and found)

Y_j = quarterly final interpolated GDP series (Final Value)

$\boxed{Y_j = \hat{Y}_j + \hat{a}_1 (X_j - \hat{X}_j)}$ model used for interpolation

(a) minimising squared first differences : boot et all.(1967)

$$\sum_{i=2}^{4n} (x_i - x_{i-1})^2$$

(b) minimising squared second differences

$$\sum_{i=n}^{4n} (\Delta x_i - \Delta x_{i-1})^2$$

Vangrevelinghe (1966) proposed a method in two steps : firstly interpolate by using a purely mathematical method; secondly modulate the figures obtained by the first step, by using a related series. More formally, let

$$x_i^* \ (i = 1, 2,...,n) \text{ and } x_j \ (j = 1, 2,...,n)$$

be the related annual and quarterly series and Y_i^* (i = 1, 2,...,n) the series to be interpolated. Thus,

(i) interpolate by Lisman and Sandee's method the series x_i^* and y_i^*; this generated $\hat{x}_j$ and $\hat{y}_j$

(ii) compute an annual least squares equation $Y_i^* = \hat{a}_0 + \hat{a}_1 x_i^*$

(iii) compute the interpolated final y_j as follows

$$Y_j = \hat{Y}_j + \hat{a}_1 (X_j - \hat{X}_j)$$

First we used twenty annual GDP/head data from IFS and we estimated the quarterly GDPs'/head' by using Boot, Feibes and Lisman's (1967) minimizing squared first differences and minimizing squared second differences techniques (see a and b). Then we combined the predicted quarterly GDP'/head' figures ($\hat{Y}_j$) with Vangrevelinghes (1966) interpolation techniques of related export series ($\hat{a}_1$ (X_j - $\hat{X}_j$)) and finally GDP per head (Y_j) are obtained.

- $\hat{a}_1$ is the slope obtained through regression of related annual export series for different countries of origin.

For Belgium, Denmark, France, Germany, Greece, the Netherlands, Switzerland, North Cyprus and Turkey we used interpolated series. For UK, USA, Italy, Austria and Israel we used quarterly actual series. France and Germany have actual quarterly data, but we made interpolation to compare the accuracy of predicted values.

The actual quarterly or interpolated quarterly series as a proxy have some methodological assessments before they are processed. All GDPs in country of origin currency are converted into US dollars by dividing EXR of country of origin.

(For the UK case[1] we multiplied the EXR rather than dividing them because indirect techniques are used in order to convert UK pounds into US dollars). Then GDPs in US dollars are divided by quarterly estimated population[2] of the country of origin. GDP per head in US dollars are then obtained as a proxy variable. Then we divided GDP per head figures by the CPI of the origin country to put them into real terms. After that we took the logarithms.

5.4.2.2 Population

The main justification for not having population as a separate explanatory variable is that its presence may cause multicollinearity problems, as population tends to be highly correlated with income. On the other hand, the procedure adopted whereby demand is specified in per capita terms, in effect, constraints the population elasticity to equal unity (if a log-linear model is under consideration). Although it is

---

[1] The UK exchange rates are published differently from those of the other countries. Indirect exchange rate calculations have been done and 1 US dollar is given in an equivalent amount of UK pounds whereas in the majority of the other countries the amount of national currency is given in terms of US dollars.

[2] The quarterly population figures are published in the quarterly UN vital population statistics bulletins.

theoretically incorrect to exclude population, it is likely that population changes in generating countries will be small over the short - medium term, and hence the model will only be affected marginally. The population figures are annual estimates. The population figures will give us more reliable estimates when we take the number of holiday visits abroad data into account as well as the income data. This approach will make the ratio of per capita of income and per capita visits that represents more accuracy. All population statistics are available in the IMF *International Financial Statistics Yearbooks*.

5.4.2.3 Own Price

Another explanatory variable, used by many researchers to test the substitution effect between holidays taken in particular countries and other forms of expenditure, including holidays taken elsewhere, is the *relative levels of prices* in the countries concerned. Basically what is needed is an index which measures the disparity between the prices of goods and services (e.g., the price includes the costs of many goods and services like accommodation, travel, restaurant meals, snacks, souvenirs, postage, car rental) in the host country and the prices of the same goods and services in competing destinations including the home countries of the tourists themselves.

The formation of such an index, however, has so far been prevented by the lack of adequate data for many countries, and in consequence most researchers have used consumer price indices as surrogate values. Morley (1994) pointed out that the use of CPI is justified on the grounds of convenience (the data are readily available) and on the argument that tourists' spending is spread over a wide part of the economy and so may approximate the general average consumer spending used to weight prices in the CPI, or that at least the CPI will track tourism price closely.

According to Witt, Brooke and Buckley (1995), there are two elements of price in international tourism : those costs incurred in reaching the destination, and those costs to be met while at the destination. Transport cost can be measured by using representative air fares between the origin and destination for air travel and representative ferry fares and/or petrol costs for surface travel. Transport cost should enter to our model in terms of foreign destination currency.

It may be possible to measure the cost of tourism in the destination by a specific tourists' cost of living variable if appropriate data are available. Jud and Joseph (1974) state that "it is appropriate to use a tourist service price index. Unfortunately, no such an index is available for all countries and to compile a reliable one requires more complete data than are available at present". Otherwise, the consumer price

index in a country may be used to represent tourists' cost of living; Martin and Witt (1987) have shown that this is likely to be a reasonable proxy for the cost of tourism variable. Tourists' cost of living should be specified in real terms in origin currency. Therefore we use the cost of living variable in real terms in our demand estimation model in chapter 8. It is sometimes suggested that exchange rates should also appear as an explanatory variable influencing international tourism demand. Although exchange rates are already incorporated to some extent in the other price variables, in practice people may be more aware of exchange rates than relative costs of living for tourists in the origin and destination countries, and thus pay considerable attention to this price indicator.

Martin and Witt (1988) have also expressed that tourists' cost of living data are divided by the exchange rate to convert the proxy tourists' living costs data from destination currency into origin currency. This is then divided by the origin country's consumer price index to yield a proxy for real tourists' living costs. Necessary adjustment is made on the cost of living variable before we take the logarithm form. Chapter 8 has the finally adjusted form of the variables and detailed list of the variables can be found in the annex.

5.4.2.4 Substitute Prices

Economic theory suggests that the prices of substitutes may be important determinants of demand. Potential tourists compare the price of foreign holiday with the price of a domestic holiday in reaching their holiday decision. However, they also compare the costs of holidaying in a particular foreign destination with the costs involved in visiting other foreign countries. Thus, substitute travel costs and substitute tourists' living costs may be important determinants of the demand for international tourism to a given destination from a particular origin (Martin and Witt, 1988). Substitute prices can be accommodated in a model through the inclusion of :

(a) a weighted average substitute transport cost variable, and
(b) a weighted average substitute tourists' cost of living variable.

The weights should reflect the relative attractiveness of the various destinations to residents of the origin under consideration, and are often based on previous market shares.

A common form in which substitute prices enter the demand function is by specifying the tourists' cost of living variable in the form of the destination value relative to the origin value, thus merely permitting substitution between tourist visits to the foreign destination under consideration and domestic tourism. The usual justification for this form of relative price index is that domestic tourism is the most important substitute for foreign tourism.

Other studies incorporate substitute prices in a more sophisticated manner. They allow for the impact of competing foreign destinations by specifying the tourists' cost of living variable as a destination value relative to a weighted average value calculated for a set of alternative destinations, or by specifying a separate weighted average substitute destination cost variable. We omit substitute prices from our demand estimation model when we make the necessary modifications.

5.4.2.5 Exchange Rates

Witt and Martin (1987a) underlined that the inclusion of exchange rates as an explanatory variable is not clear cut because of the interrelationship between exchange rates and relative inflation rates. However, as exchange rates can fluctuate more rapidly than relative rates of inflation, many studies have specifically examined the influence of exchange rates on the demand for international tourism (e.g., EIU 1972; Gibbons and Fish 1985; Rosenweig 1985, 1986, 1988; Artus 1970; Chadee and Mieczkowski 1987; Gerakis 1965).

Fluctuating exchange rates can result in several different effects on tourism. The EIU (1975) identified the impacts of an unfavorable change in exchange rates to include (1) less travel abroad, (2) travel to different locations, (3) a reduction in expenditure and/or length of stay, (4) changes in the mode or time of travel, and (5) a reduction in spending by business travellers. Similar reverse effects are recognised by Gerakis (1966) as resulting from a favourable change, namely (1) more spending on things that would have been purchased anyway, (2) spending on additional goods and services, (3) a shift in spending from other destinations, (4) the attraction of new tourists, and (5) the attraction of border shoppers.

It has been found that the exchange rate may have a significant effect on the extent of international travel. The price of foreign currency will influence tourists. Thus, if the price of foreign currency declines, tourists are likely to demand more services, *ceteris paribus*. Uysal and Crompton (1984) have stressed that, if the price of a vacation in Turkey remained constant in the last two years in terms of Turkish lira, but the price of the Turkish lira declined significantly relative to the German mark in the second year, it would be expected that Germans would purchase more travel services from Turkey in the second year.

Syriopoulos (1995) also mentioned that the specification of the model in a dynamic form permits examination of certain aspects of the exchange rate theory. In the short run, exchange rate differentials may be of particular importance when the tourist is planning a holiday. Tourists are usually more aware of exchange rates than of relative prices, owing to the wider publicity of information about the former. However, although exchange rates in a destination may become favorable to the tourist, this could still be counterbalanced by high inflation rates. So, in the short run, it may be important to study exchange rate effects separately from price effects and in the long run it is important to look at the price impact (relative price changes adjusted for exchange rate effects) that is expected to be more significant for tourism demand. The possibility, then, that national price levels and nominal exchange rate

levels may follow different paths in the short run, but may converge towards a common equilibrium path in the long run, is allowed for in the model. Econometrically, this is attained by including nominal prices separately from nominal exchange rates in the short run (change terms), but from effective prices in the long run (level terms), and by testing for the statistical significance of these variables.

The Exchange rate of the origin and also destination country in US dollars is obtained as a secondary data from IFS statistics on quarterly basis. The EXR of the origin country in real value is divided by the EXR of the destination country to convert the currency of the visiting country to the home country (EXR_i / EXR_j). Then the logarithm is of course taken.

5.4.2.6 Transport Costs

Syriopoulos (1995) has identified that the transportation costs between a destination and an origin, and/or alternative destinations, can be a significant component of the price of a tourism product (Jud and Joseph, 1974; Kliman, 1981). However, the cost of transportation should take account of both the cost of the fare and the value the tourist assigns to the time of the journey (Gronau, 1970).

Transportation costs can be measured as the weighted mean price of all types of transport to the destination, by sea, land and air. The calculation of a transport cost variable was not possible due to the complexity of the fare structure and changes in route networks and departure frequencies.

The economy class air fare of a return (scheduled) trip between the origin's and the destination's capital cities has usually been used for transportation costs. This, however, is not relevant to Mediterranean tourism since a large share of air traffic, covered to a great extent by charter flights, is not destined for capital airports but for regional airports closer to the main tourist resorts and the fares may differ

considerably from those to capital cities (Pearce, 1987). A significant share of tourists to the Mediterranean also arrive by means other than aeroplanes (OECD, 1991).

Several authors have suggested that a transport cost variable should be included, but have not incorporated this variable in their models owing to lack of adequate data. However, Gray (1966), Jud and Joseph (1974), Little (1980), Stronge and Redman (1982) and Witt (1980a,b) included a cost of transport variable using either representative fares in real terms or data on expenditure on fares. Jud (1974) used distance as a proxy for the cost of travel in one set of models, while Bond and Ladman (1972) used a weighted average one-directional air fare cost as a proxy for how the cost of a whole trip might vary over time.

In this study, the cost of transport variable is derived as follows. For travel, the economy return air fare is taken as a proxy from the origin country to the foreign destination country. We tried to take capital cities' airports and in some cases we used the busiest airport e.g. Istanbul, even though it is not a capital. This is due to the fact that Istanbul has got more air connections with the rest of the world than Ankara, the capital. For surface travel, petrol (diesel) costs are taken, based on distance between origin and destination major cities. Since we do not have ferry rates, we are not able to include the cost of ferry crossing in our study. Therefore, the proxy surface cost is not very consistent when island countries are considered. However, when central and north Europe are considered (in which case ferry crossing is not necessary) the proxy will be consistent. The costs are based on an average-sized car carrying two persons. The transport cost variable enters the equations in real terms of the origin currency.

As with other demand determinants, measuring the cost of transportation presents substantial difficulties. Crouch (1994b) has emphasised that problems arise due to different modes (surface, air, sea) and types (e.g., car, train, air-charter, scheduled-air) of travel. Fares vary seasonally and by class of travel. For a long-haul

destination like Australia, representative air fares provide a reasonable solution. Measuring the cost of transportation between countries within Europe, however, is very problematic. It is not surprising that numerous studies reject any attempt to account for variations in the cost of transportation.

An appropriate measure of transport cost is the weighted average price of all modes of transport, namely air, sea and land transport. However, it is difficult to construct a meaningful transport cost variable because of the complexity of the fare structure, and inadequate and unreliable data. Furthermore, an increasing proportion of tourists are joining package tours which include air fares and accommodation. Many previous studies, which include transport costs as an explanatory variable in tourism demand models, have realised that the variable is statistically insignificant, has the wrong coefficient sign, and that multicollinearity exists between income and transport costs. Subsequently, the transport cost variable is omitted from the model. However, the problem of misspecification bias may arise as a result of omitting this variable. It is crucial to perform appropriate diagnostic tests to examine the effects of omitting the transport cost variable from tourism demand models.

The Economy Return *air fares* (YE) for scheduled flights from the capital of the origin country to the capital of the destination country are obtained in the origin countries currency from the ABC World Airways Guide. The International Civil Aviation Organization at Holborn in London supplied all data to us on quarterly basis. Since there are two price increases in a year (approximately 5% in April) and (approximately 3% in October) we used April's and November's publications and we assumed the other two which represent winter and summer seasons to be the same.

Sometimes important destinations are taken rather than the capital city due to the fact they are the busiest airport destinations (e.g. Mexico City in Mexico, Cologne in Germany). Then the (YE) economy air fares are divided by the origin country CPI to adjust with inflation. Then we adjusted the air fare with the EXR of the

destination country to convert it into real terms with the destination country's currency (then the data is converted into US $).

The *Surface cost* is calculated with different methodological techniques. Firstly, we obtained the diesel fuel prices per liter, tax included, from OPEC in the country of origin currencies. Secondly, we obtained the distances[3] in miles and kilometers from the country of origin's capital to the destination capital. Thirdly we adopted the assumptions made by Witt and Witt (1992) that the average car consumes 1 gallon of diesel fuel per 30 miles (7.925 miles - 1 liter of diesel). We then converted gallons into litters and kilometers into miles. We also calculated the return distances by multiplying by two. We then multiplied the energy prices, including tax, of the origin country with the total amount of liter of diesel for the RTN distance. The calculated results are adjusted to the origin countries currency through multiplying with the exchange rates of the origin i and then put into real terms by multiplying with the origin i's CPI (see Martin, C. A., 1987).

[3] Europe Atlas was used as a source.

5.4.2.7 Dummy Variables

Dummy variables included in econometric models explain international tourism demand to allow for the impact of "one-off" events. These are specially constructed variables which take the value 1 when the event occurs and 0 otherwise. The 1979 oil and 1991 Gulf crises for example are likely to have temporarily reduced international tourism demand and will be used as dummies in our model.

Another example is the political unrest in Turkey in '80-'81 which led to reduced tourism flows to both North Cyprus and Turkey. When the Turkish government devalued the Turkish lira, the number of outward visits from Turkey declined. As a result, North Cyprus was affected, because roughly 80 per cent of the island's visitors are Turkish. It may be helpful to make some more clarifications here. The

Turkish visits from Turkey to the island have to be considered as domestic visits, because there are no entry checks on either border. Turkish Lira is the legal tender in both countries and the reduction on the number of Turkish visitors to the Island was due to the effect of the decline in real purchasing power of the lira. The result was the same for the visits from Istanbul to Ankara, or from Istanbul to Antalya.

On the other hand, devaluation had a positive effect on the other countries' outward visits to Turkey and to North Cyprus. This is because of the increase in the values of other currencies (e.g., DM, FIM, US $, £) against the Turkish Lira. This policy increased the number of overseas visitors to Turkey in 1994 and 1995 or increased the average length of stay simultaneously. The same is happening to Greece this year. The recent devaluation in the Greek Drachma (March 1998) led many British tourists to visit Greece due to the strong pound and consequently cheap tourism in Greece. The above examples show the needs of dummies in case of political crisis or economic unrest.

Actually, a potentially wide range of factors might be modelled. Previous research has used them to model the impact of political instability and social conflict, terrorism, travel restrictions, foreign exchange restrictions, changes in duty free allowances, economic recessions, world fairs and sporting events, oil crises and national celebrations. Crouch (1994b) has also affirmed that dummy variables have also been used to account for other changes, such as the use of different data sources or discontinuities in recording methods. In cross-sectional studies, dummy variables have occasionally been incorporated to facilitate the estimation of different demand coefficients by country of origin or destination. Additionally, in time-series studies involving time periods shorter than one year, dummy variables have been used to allow for the effect of seasonality.

5.4.2.8 Trend

A trend term may be included in international tourism demand models if it is relevant. This term mainly represents a steady change in the popularity of a destination country over the period considered as a result of changing tastes, but it also captures the time-dependent effects of all other explanatory variables not explicitly included in the equation, such as changes in air service frequencies and demographic changes in the origins. The trend variable may take on either a positive or negative coefficient. The Isle of Man has faced some 'popularity' problems in the last two decades, since the number of passenger arrivals reduced from 600,000 to 300,000. Referring to the previous chapter, the IOM government has developed some rejuvenation strategies to develop tourism and achieve the previous figures. Yorucu and Jackson (1996) summarised these strategies and explained the IOM tourism with a "*tourist area life cycle*" model which demonstrates the relationships between the number of tourist arrivals and time of development.

5.4.2.9 Promotional Activity

National tourist offices often spend considerable sums in foreign countries on promoting their country as a tourist destination, as do carriers, particularly airlines. Therefore, promotional expenditure (e.g., advertising, incentives) is expected to play a role in determining the level of international tourism demand and thus should feature as an explanatory variable in the demand function. The appropriate form of the variable is promotional expenditure for the destination in the origin country currency in real terms.

The most difficult part is to obtain the relevant data. Most of the countries' national tourist offices or ministries are reluctant to supply government information to the public even to researchers, as all data is confidential. A further problem concerns the form of the relationship; the impact of advertising on tourism demand may be

distributed over time, so that advertising in a given period is likely to influence not only demand in that period but also in subsequent periods, although the effect will diminish with the passage of time. In addition, the effectiveness of a given level of advertising expenditure in influencing the level of international tourism demand may vary across media. In our tourism demand function we excluded the promotional variable because of the data complexity.

5.4.10 Lagged Dependent Variable

The inclusion of a *lagged dependent variable* as an additional explanatory variable in a regression model will extend the model and make it more understandable. This can be justified first in terms of *habit persistence*.

After visiting a foreign country, people's knowledge about its characteristics largely increases, so there is much less uncertainty associated with holidaying again in that country than travelling to a previously unvisited foreign country. As people generally respond to risk aversion, there will be a tendency for them to return to the same country, year after year.

In addition, when people return from a foreign holiday they tell their friends about the trip, so more people increase their knowledge about the holiday alternative. This sort of personal contact is probably a powerful stimulus to buying foreign holidays, because the individual is likely to believe that the personal contact is giving a reasonably independent view of the merits of a holiday.

In addition, with foreign holidays in particular, individuals have to rely a great deal on other people's opinions since there is much uncertainty present - foreign holidays, unlike most other similarly price goods, cannot be examined in show rooms prior to purchase. As the decision to take a given foreign holiday may result from previous personal experience or contact with other people who have already selected that alternative, the number of people choosing a given holiday in any year depends partly on the numbers who chose it in previous years.

Secondly, the inclusion of a *lagged dependent variable* may also be justified in terms of *supply constraints*. Supply constraints may take the form of shortages of hotel accommodation, passenger transportation capacity and trained staff, and these cannot always be increased rapidly. A certain rigidity exists in the foreign holiday market. In terms of growth, time is required to build hotels, train hotel staff and generally increase facilities in the destination. Gujarati (1988) has indicated that if a partial adjustment mechanism is postulated to allow for rigidities in supply, this results in the presence of a lagged dependent variable in the tourism demand function. The following partial adjustment process is therefore postulated:

$$\log\frac{T_t}{P_t} - \log\frac{T_{t-1}}{P_{t-1}} = \lambda\left(\log\frac{T_t^*}{P_t} - \log\frac{T_{t-1}}{P_{t-1}}\right), \qquad 0<\lambda<1 \qquad \text{(A)}$$

where * denotes the desired value. $0<\lambda<1$ since there is some adjustment, but it is incomplete. This equation may be rewritten as

$$\log\frac{T_t}{P_t} = (1-\lambda)\log\frac{T_{t-1}}{P_{t-1}} + \lambda\log\frac{T_t^*}{P_t} \qquad \text{(B)}$$

where T_t is the number of visits in year t. P_t stands for the population in year t. T_t^*, the desired level of holidays in year t, is a function of our previous set of explanatory variables, so model (B) only differs from the basic model (international tourism demand model) by the inclusion of a lagged dependent variable.

The value obtained for the lagged dependent variable, shows that habit persistence and/or constraints on supply play an important role in the foreign holiday market. The estimated income elasticity of value above 1 ($E_I > 1$ income elastic) implies that foreign holidays are luxuries, and estimated income elasticity of value below 1 ($E_I < 1$ income inelastic) implies that foreign holidays are necessities.

When income elasticity is allowed to vary across the two sets of origin data in the lagged dependent variable model, the estimated value for one origin data is greater than unity, and for other origin data less than unity. This implies that foreign holidays are luxuries to own country residents but necessities to other country residents.

On the other hand, Syriopoulus (1990) has noted that it is reasonable to accept that the supply of tourism does not impose any constraints on tourism demand. The presence of excess capacity would not be unrealistic, since investment in the tourism sector, as in hotel construction and infrastructure for instance, is built with a view to satisfying not only current but also future consumption. Moreover, during recent years, a shift in the type of accommodation from hotels to self-catering establishments (villas, apartments) has been experienced, which contributes to overcoming any potential accommodation constraints (Zacharatos, 1986). Apart from this, the steady growth of package holidays over recent years implies that prices of goods and services consumed by tourists are determined in advance and do not respond diversly to the level of tourist inflows.

5.5 Sources Of Data

International tourism demand is generally measured in terms of the number of tourist visits from an origin country to a foreign destination country or in terms of tourist expenditures by visitors from the origin country in the destination country. As tourist expenditure data are generally less reliable than visit data, we have decided to use visit data for our demand estimation model. North Cyprus', Turkey's, UK's, the IOM's, Malta's and Austria's tourism demand will be estimated in chapter 8.

Monthly data on inward tourism for North Cyprus are collected from the Tourism Ministry of North Cyprus and the Prime Ministry State Planning Organization publications (*KKTC Turizm Yilligi*) and it covers the period 1976 - 1995.

Other monthly data which are supplied by the Austrian Tourist Board are found in *Der Aktuelle Ruckblick, Osterreich Werbung Marktforschung* and also in the *Osterreichische Fremdenverkehrswerbung*.

Annual data for Turkey are obtained from the Turkish Tourist Board from the *Bulletin of Tourism Statistics (Turizm Istatistik Bulteni)* covering the period 1976 - 1995.

Quarterly inward tourism data by overseas visitors to the UK are obtained from the British Tourist Authority from the *Tourism Intelligence Quarterly (International Passenger Survey)* for the period 1976 - 1995.

The statistics related to Malta and supplied by the Malta National Tourism Organizations are issued monthly for UK residents by the Malta National Tourism

Organizations and for the others by the *Tourism Statistics, Research and Planning Division.*

The IOM Passenger Traffic by area and mode of travel statistics, issued by the *IOM Government-The Treasury,* are supplied monthly from 1985 to 1995. Yearly data are also available from 1888 to 1995, but we are not interested in them since we work on quarterly time series data.

We converted all monthly data into quarterly series in TSP package. We will also make forecasting with different forecasting techniques. There will be more explanations about forecasting in the next chapter.

The statistics about population, exchange rate, national disposable income, and CPI (consumer price index/relative price index) are obtained from the *International Financial Statistics* published by the International Monetary Fund (IMF). For the IOM, *The Treasury* and for North Cyprus, *State Planning Organizations (SPO)* statistics are supplied.

Data about national disposable income are not available for every country. We therefore face difficulties in using national disposable income in our model. We will overcome this shortcoming by using GDP per capita figures as a proxy variable. For countries who do not publish GDP or GNP on a quarterly basis, we will interpolate yearly data as explained in section 5.4.2.1 above.

For transport costs, we obtained air fares from the *ABC World Airways Guide* for the period 1975 - 1992 and from the *Worldwide Fares* for 1992 onwards by the *Air Tariff Publications.* For the Northern Cyprus air fares we used Cyprus Turkish Airlines Statistics.

We also obtained diesel prices from OPEC/*OECD* publications. The cost of the surface travel will be calculated by a different method which is explained above in section 5.4.2.6. We obtained the distances in kilometers from the origin capital to the destination capital from Europe atlas.

5.6 The Estimation Of Demand Functions

The tourism demand function may be estimated by regression analysis using historical data. We are planning to estimate our demand model through regression analysis using twenty years' quarterly data (eighty observations) covering the period 1976-1995. The OLS (ordinary least-squares) multivariate regression analysis has been the most widely used approach. Its advantages include the ability to model cause and effect, to carry out "what if" forecasting, and to provide statistical

measures of accuracy and significance. However, in some cases where the Durbin-Watson (DW) statistic indicates the presence of autocorrelation (see Durbin and Watson, 1950, 1951, 1971), the parameter estimates are inefficient and the usual hypothesis-testing procedures are no longer strictly valid. Therefore, those equations are re-estimated using the Cochrane-Orcutt (CO) iterative procedure in an attempt to reduce the likelihood of autocorrelation. Crouch (1994a) has identified that methodologies employed from different studies state that approximately 84% of the studies appear to have used ordinary least-squares multiple regression, although approximately 89% of the studies use some form of regression analysis, including Cochrane-Orcutt regression, two-stage least-squares regression, and constrained and Bayesian regression. Other methods employed include quasi-experimental static group comparison, AIDS (Almost Ideal Demand System, Witt (1977)) system of demand equations solved by maximum likelihood estimation or the generalized least-squares method for seemingly unrelated regressions, maximum likelihood, canonical correlation, variance component modelling of pooled data, and other ad hoc procedures. You may find more information in the literature about their application and practices (Judge et al (1988); Griffiths, Hill, and Judge (1993); Gujarati (1988), (1992)). Witt, Brooke and Buckley (1995) exaggerated that the empirical results obtained show the estimated quantitative relationship between foreign holiday demand and the influencing factors. The estimation process is as follows:

1. Specify the demand function in mathematical form (say, linear, or more commonly, log linear.
2. Assemble data relevant to the model.
3. Use the data to estimate by regression the quantitative effects of the influencing variables on demand in the past.
4. Carry out tests on the estimated model to see if it is sufficiently realistic.

If the tourism demand function is specified in log-linear form, the estimated coefficients may be interpreted directly as elasticities. It is necessary to evaluate the parameter estimates obtained in a regression model in terms of both sign and

magnitude in order to determine whether these estimates are theoretically meaningful. Satisfactory models are defined as those for which a statistically significant **F** statistic is obtained; "correct" signs are estimated for the coefficients, and the DW statistic indicates the absence (or likely absence) of autocorrelation. If the **F** statistic indicates that the whole equation is not significantly different from zero at a 5% level, then it is not clear that the model explains any variation in tourism demand and such models are unacceptable. Economic theory imposes restrictions on the signs and values of the parameters in demand functions, and the estimates need to be examined to see whether they satisfy these constraints. For example, foreign holidays are "superior" good and thus a positive income elasticity is expected. In fact, most foreign holidays are regarded as "luxuries" and, in such cases, the magnitude of the income elasticity is expected to exceed unity. Similarly, the own-price elasticity of demand should be negative and cross-price elasticities for substitutes positive. The exchange rate coefficients should have positive signs, the same as the income coefficient. Economic crisis and political unrest, oil and Gulf crisis are dummy variables which are expected to be negative. Changes in consumer tastes may move towards or away from a particular holiday and therefore the trend variable could have a positive (gaining popularity on account of changing tastes) or negative (losing popularity on account of changing tastes) coefficient. The promotional expenditure (not included here in our tourism demand model) and lagged dependent variable coefficients are both expected to be positive. If an estimated parameter has an "incorrect" sign or does not satisfy the restrictions on magnitude, it should be rejected as it is theoretically implausible. In general, an unexpected parameter sign or size is the result of deficiencies in the model.

The empirical results may also be evaluated in terms of statistical measures of accuracy and significance of the forecasting equations. For example, the *t* test can be employed to examine the hypothesis that a particular explanatory variable coefficient is significantly different from zero, or to verify whether the estimated value may simply have been generated by chance. If the hypothesis of a coefficient being equal to zero is true, then the corresponding explanatory variable does not influence the

dependent variable and should be excluded from the tourism demand function. However, when a parameter is not statistically significant (say at 5 per cent significance level), this does not prove that there is no relationship between the explanatory and dependent variables. The insignificance of the parameter may be a result of statistical problems. More detailed econometric information will be given in chapter 7 when the empirical results will be obtained.

5.7 Conclusion

The theory of demand describes the international specialisation of countries in respect to internal, regional and international demand. In this chapter, we aimed to explain the theory of demand and also reviewed the literature within the economic discipline. The multivariate regression demand model and the methodology that will be followed is explained with all specifications. The econometric model that will be estimated has a logarithmic form in order to have linearity which corresponds the elasticities. The number of tourist visits from a country of origin to a country of destination will be based on the Witt and Martin (1987) model, which is composed of income, cost of living, exchange rates, air fares, surface transportation costs, seasonal dummies, breakdown dummies, trend and the lagged dependent variable.

The sources of data used in this study are also explained. The estimation of the demand function will be held through ordinary least squares (OLS) techniques, and Cochrane Orcutt (CO) will be used where autocorrelation and multicollinearity problems exists during the estimation procedure. Durbin Watson (DW) statistics are the major test to identify the presence of autocorrelation and CO procedures will take place where it is necessary for re-estimation to reduce the likelihood of autocorrelation. Finally, the correct signs of every explanatory variable is explained with respect to economic meanings.

Ch 6 : Cointegration Analysis

6.1 Introduction

There are many developments both in econometrics and software application packages; therefore, we decided to bring our research up to date. Kulendran (1996) and Kulendran and King (1997) are the best examples and useful guides for us in the estimation of international quarterly tourist arrivals. They worked on time-series models with strong trends and seasonal components. Kulendran and King (1997) is one of the latest examples in forecasting international quarterly tourist flows by using error correction and time series models. They used Johansen's (1988) full-information maximum likelihood method to estimate the long-run relationships between tourist arrivals and the factors that influence these arrivals such as income, price and air fare. They tested the possibility of multiple long-run relationships using the Johansen and Juselius' (1990) test, but, in each case, they only found one relationship. Therefore, Martin and Witt's (1989) econometric model involved the use of least squares regression to model the level of tourist arrivals in a particular country as a linear function of the factors (such as income, price, air fare and special events) which influence arrivals. This is the basic structure for Kulendran and King's (1997) cointegration study.

Cointegration is a broad field which needs a lot of research in literature. More than 370 articles and maybe more than a thousand working papers were published on cointegration from 1990 to 1997. We had a broad research on BIDS (Computer Research Network) and we chose some selected papers for a brief literature review. To do integration, stationarity tests (unit root tests) for time series are necessary.

We will use TSP version-7 to run unit root tests (Dickey and Fuller (1979, 1981) stationary) with trend and constant variables. We will also use augmented Dickey Fuller (1981) with four lags. In TSP version-7 (1992), we can only test stationarity and EG cointegration. Since the programme is lacking the Johansen cointegration test, we decided to use Eviews (Econometric Views) version-2 (1995) which is more comprehensive and user friendly in well structured form for not only forecasting, but for stationary and cointegration tests as well.

6.2 Theoretical Background

We are keen on using recently developed rebust time series methods (such as "*cointegration analysis*"); we will apply the international quarterly tourist arrivals models to Austria, UK, Turkey, Malta, North Cyprus and the Isle of Man. Based on the findings, some theoretical and policy implication will also be drawn. The main aim for using cointegration is to model tourism demand with the standards in the light of recent developments in the area of tourism and also to give a brief understanding of the effect of long term relationships between the exogenous variables on tourism demand. Since non stationary time series data may cause spurious regression results, an appropriate long run modelling strategy, namely "*cointegration analysis*", should be employed to make sure that the long run relationship, under consideration, is a "genuine" one. We will test about 300 nonstationary data series from 23 different destination countries and also the Johansen (1991) cointegration results in comparison with the Mackinnon (1991) critical t-values. This will show us whether there is a long run relationships between international tourism demand and composition of income, cost of living, exchange rates, air fares and surface costs.

6.3 The Methodology

The time series of econometrics used for the evaluation of international tourism demand model will be applied on this thesis. Both short run and long run elasticities are estimated and short-term elasticity's are obtained through regression analysis. The results are tabulated in chapter 7, as well as long-run elasticities. In this framework, the relationship between the number of tourist arrivals and income, cost of living, exchange rates, air fares and surface costs is the central point. This analysis is mostly descriptive, supported by relevant tables and figures.

It has been proved that "differencing" results in a loss of some valuable long-run information in the time series data. It is therefore inevitable to use cointegration analysis since there has been an extensive amount of researches on it since the early 1980s. Cointegration analysis within time series econometrics was introduced to the literature in the early 1980s, and has recently become an established method of empirical modelling. Later, the relationship between error correction models and cointegration gained a remarkable importance and was first pointed out by Granger (1981). Advance complex models followed by researchers in recent studies, however, we will focus on single equation case quarterly time series data and we intend to stay non-technical and avoid the specific details. Apart from Engle and Granger (1987), we also used Johansen (1988) (1991) method briefly.

The following recent articles survey the issue of "cointegration" : Bonham and Gangnes (1996), Kulendran (1996), Kulendran and King (1997), Gonsales and Moral (1995) specifically on tourism, Ghathak, Milner and Utkulu (1997), Engle et al. (1993), Bremnes and Saettem (1997), Ramanathan et al. (1997), Ho and Sorensen (1996), Ahmad and Harnhirun (1996), Yang and Bewley (1996), Hsiao (1997), Williams and Bessler (1997), Zapata and Rambaldi (1997), Apergis (1997), Masih and Masih (1997), Campos, Ericsson and Hendry (1996), Johansen and Juselius (1990), Osborn (1993) and Utkulu (1994) are some other various studies. The latter emphasised that the basis of cointegration analysis draws on three themes in the recent literature : stationarity, spurious regression and error-correction mechanism (ECM). The key concept underlying the concept of cointegration is the idea of stationarity. Any time series data can be thought of as being generated by a stochastic or random process. Gujarati (1992) pointed out that a stochastic process is said to be stationary if its mean and variance are constant over time and the value of covariance between two time periods depends only on the distance or lag between the two time periods and not on the actual time at which the covariance is computed[1].

To explain this statement, let Y_t be a stochastic time series with these properties :

Mean : $E(Y) = u = \text{constant}$ (Eq 1)

Variance : $\text{var}(Y) = E(Y - u)^2 = \sigma^2$ (Eq 2)

Covariance : $\gamma_k = E\{(Y_t - u)(Y_{t+k} - u)\}\text{Cov}(Y_t, Y_{t+k}) = \sigma_j$ (Eq 3)

Thus, the means (Eq 1) and the variance (Eq 2) of the stochastic process Y_t are constant over time, while the value of covariance between periods (Eq 3) depends only on the gap between periods, and not on the actual time at which this covariance is considered. Y_k, the covariance (or autocovariance) at lag k, is the covariance between the values Y_t and Y_{t+k} that is, between two Y values k periods apart. If k = 0, we obtain Y_0, which is the covariance between two adjacent values of Y. If one or more of the conditions above are not held, then Y_t is said to be nonstationary. The mean, variance and autocovariances are thus independent of time (i.e. remain constant over time). Broadly speaking, if a time series is not stationary in the sense just defined, it is called a nonstationary time series[2]. Sometimes, nonstationarity could be due to a shift in the mean.

6.4 Order Of Integration

The degree of integration of a series is closely related with stationarity. A nonstationary series is said to be integrated of order d {denoted $Y_t \approx I(d)$} if it has to be differenced d times to be stationary[3].

---

[1] In the time series literature such as a stochastic process is known as a weakly stationary stochastic process.

[2] Keep in mind that we are only considering weak stationarity.

[3] DSP (difference stationary process) and TSP (trend stationary process) are two mainly used approaches in the literature to reach stationary. In our study we used DSP; that is, stationarity is achieved by successive differencing . We also used constant and trend variables to test the order of integration at four lag levels.

It is still possible to run regressions, even if time series do not satisfy the stationarity assumption, since these regressions could simply be spurious (meaningless). This leads us to the concept of "spurious regression (correlation)". Gujarati (1992) defined the spurious regression concept as the fact that regression of one time series variable on one or more time series variables can often give nonsensical or spurious results. One way to guard against this is to find out if the time series are cointegrated. Utkulu (1994) also mentioned in his study that the possibility of correlation representing a purely mathematical rather than a causal relationship is referred to as spurious correlation. The regression which includes spuriously correlated variables is nonstationary. Charemza and Deadman (1997) accentuated more on spurious regression and are lucid and comprehensible in their explanations.

An alternative test of stationarity that has recently become popular is known as the *unit root test*. The easiest way to introduce this test is to consider the following model:

$$Y_t = Y_{t-1} + u_t \qquad \text{(Eq 4)}$$

where u_t is the stochastic error term that follows the classical assumption, namely, it has zero mean, constant variance σ^2, and is nonautocorrelated. Such an error term is also known as a *white noise error term* in engineering terminology[4].

If the coefficient of Y_{t-1} is in fact equal to 1, we face what is known *as the unit root problem*, i.e. a nonstationary situation[5]. Therefore, if we run the regression

$$Y_t = \rho Y_{t-1} + u_t \qquad \text{(Eq 5)}$$

[4] Note that if u_t is not only noncorrelated but also independent, then such an error term is called strictly white noise. If the error term is autocorrelated then augmented Dickey-Fuller (ADF) test can easily allow for this contingency.

[5] $Y_t - Y_{t-1} = u_t$ By using the lag operator L so that $LY_t = Y_{t-1}$ $L^2 Y_t = Y_{t-2}$ and so on, we can write $Y_t - Y_{t-1} = u_t$ as $(1-L)Y_t = u_t$ The term unit root refers to the root of the polynominal lag operator.

and actually find $\rho = 1$, we say that the stochastic variable Y_t has a unit root. In (time series) econometrics, a time series that has a unit root is known as a *random walk* (time series). A random walk in its turn is an example of a nonstationary time series.

An alternative form of $Y_t = \rho Y_{t-1} + u_t$ is expressed as

$$\Delta Y_t = (\rho - 1)Y_{t-1} + u_t \qquad \text{or} \qquad \text{(Eq 6)}$$

$$= \delta Y_{t-1} + u_t$$

where $\delta = (\rho - 1)$ and where Δ, as we know, is the first difference operator. Note that $\Delta Y_t = (Y_t - Y_{t-1})$. However, now the null hypothesis is that $\delta = 0$. If δ is in fact 0, we can write eq (6) as

$$\Delta Y_t = (Y_t - Y_{t-1}) = u_t \qquad \text{Eq (7)}$$

Eq (7) refers to the first differences of a random walk time series ($= u_t$) in a stationary time series because by assumption u_t is purely random.

Utkulu (1994) gave a basic definition by referring to Engle and Granger (1987):

> *A non stationary series by differencing d times is said to be integrated of order d. A time series X_t integrated of order d is denoted $X_t \sim I(d)$.*

For example, if $X_t \sim I(2)$, the first differences of the first differences of X_t achieve stationarity :

$$\Delta\, \Delta X_t = \Delta (X_t - X_{t-1}) = (X_t - X_{t-1}) - (X_{t-1} - X_{t-2}). \qquad \text{(Eq 8)}$$

This operation is termed "second (order) differencing" and the resulting series called "second differences".

The relevant tests for integration level in three categories are visual inspection and sample autocorrelations (correlogram) of the series, integration Durbin-Watson

(IDW) statistic test and regression-based t-tests such as Dickey-Fuller (DF)[6], the Dickey-Pantula (DP)[7], and Phillips-Perron (1988) tests.

The DF test involves estimating regression equations and carrying out standard t-tables. However, with nonstationary variables, the distribution of these statistics are non standard, and thus special tables derived by simulation are essential[8].

If a time series is differenced once and the differenced series is stationary, we say that the original (random walk) series is integrated of order 1, denoted by I(1). Similarly, if the original series has to be differenced twice (i.e. take the first difference of the first difference before it becomes stationary), the original series is integrated of order 2, or I(2). In general, if a time series has to be differenced d times, it is integrated of order d or I(d).

Thus, any time we have an integrated time series of order 1 or greater, we have a nonstationary time series. By convention, if $d = 0$, the resulting I(0) process represents a stationary time series.

Under the null hypothesis of $\rho = 1$, the conventionally computed *t* statistic is known as the τ (tau) statistic, whose critical values are tabulated by Dickey and Fuller on the basis of the Monte Carlo simulations. In the literature the tau test is simply known as the Dickey-Fuller (DF) test. Note that, if the null hypothesis of $\rho = 1$ is rejected (i.e. the time series is stationary), we can use the usual (students) t-test.

We may apply the DF test to a model with a number of lagged difference terms. The number of lagged difference terms to include is often determined empirically, the idea being to include enough terms so that the error term in an equation is

---

[6] See Dickey and Fuller (1979, 1981).
[7] See Dickey and Pantula (1987), augmented Dickey-Fuller with lagged differences.
[8] This is termed "modified t-statistic" by Holden and Thompson (1992, p.13)

serially independent. When we apply the DF test with lagged difference, it is called "augmented Dickey-Fuller (ADF) test". The ADF test statistic has the same asymptotic distribution as the DF statistic, so the same critical values can be used.

Most of the examples and definitions used here are taken from Gujarati (1992), since they are easier and less sophisticated to explain.

The ADF test is widely regarded as being one of the most efficient tests for integration level :

$$\Delta X_t = \lambda X_{t-1} + \sum_{i=1}^{k} \psi_i \ \Delta X_{t-1} + \varepsilon_t \qquad \text{Eq (9)}$$

A practical rule for establishing the number of lags for ΔX_{t-1} (the value of k) is that it should be relatively small in order to save degrees of freedom, but large enough to secure the lack of autocorrelation of the error term. One can use the Lagrange Multiplier (LM) tests for serial correlation, the DW test or any of the model selection procedures such as the Akaike Criterion (Charemza and Deadman, 1997)[9] to choose the optimal value for k Perron (1990), Phillips and Perron (1988) have an alternative correction test (PP-test) for integration level.

Dickey (1993, p.330) has pointed out the importance of seasonality and he referred to Dickey, Hasza and Fuller (1984) when quarterly or monthly stationarity is concerned. He has done a lot of computing work in order to present a motivation to improve our understanding of seasonality and our ability to capture it in a model.

Dickey, Hasza and Fuller (1984) with their model

$$Y_t = Y_{t-d} + e_t \qquad t = 1, 2,... \qquad \text{eq(10)}$$

represented monthly data by d = 12, and quarterly data by d = 4. They used the Monte Carlo integration for finite samples to compute unit roots at the deasonal lags for time series data. Another approach was made by Hylleberg, Engle, Granger and

[9] See Charemza and Deadman (1997, pp251-252). AIC is used to give the minimum lag level for best model selection.

Yoo (1990) or HEGY. They test economic series for seasonal unit roots. HEGY considered factorisation as :

$$1\text{-}B^4 = (1\text{-}B)\,(1\text{+}B)\,(1\text{+}B)^2 \qquad \text{eq(11)}$$

where B is the backshift operator. If X contains unit roots at all the deasonal frequencies $\theta = 0$, 1/4, 1/2, 3/4, then each of X_t-X_{t-1}, X_t+X_{t-1}, X_t+X_{t-2}, and X_t-X_{t-2} is nonstationary. Kulendran (1996) is the most recent example to apply HEGY for modelling quarterly tourist flows to Australia using cointegration analysis. For seasonal integration he implemented HEGY on the UK, New Zealand, Japan and the USA.

Osborn (1993) mentioned HEGY in his paper that in an example of a quarterly process with all seasonal unit roots, namely, $\Delta_4 X_t = \varepsilon_t$ where ε_t is a zero mean white noise process and since all lags are annual ($X_t = \varepsilon_t + \varepsilon_{t-4} + \varepsilon_{t-8} + \ldots$), X_t for a specific quarter Q (Q = 1, 2, 3, 4)) is influenced only by quarter q shock. In other words, the four quarters follow independent random walks, so that there are no intra-year links in *X* at all.

He has mentioned that to consider the case of *X* being conventional an I(1) process except for deterministic seasonal effects. Then the quarterly change,

$$X_t - X_{t-1} = \sum \; uqdqt + u_t \qquad \text{eq(12)}$$

is stationary after subtraction of its seasonal mean (d_q is the zero/one dummy for quarter q). Under this situation any two adjacent quarters are cointegrated with (1, -1) as the cointegrating vector and there exists a long-run equilibrium between the seasons. These two possibilities (seasonal differencing versus an I(1) process with deterministic deasonals) are extensively examined by Beaulieu and Miron (1990) for the US and Osborn (1990) for the UK. Ghysels, Lee and Noh (1994) have also contributed to the literature with tests for unit roots in deasonal time series. They are based on the HEGY theorem and they studied some theoretical extensions and a Monte Carlo investigation.

Utkulu (1994) gave a simple example from the economic theory by suggesting a long-run relationship which we changed the assumption and decided to describe with the following equation :

$$V_t^* = \beta IN_t \qquad \text{eq (13)}$$

where C_t* is the long-run equilibrium path (i.e. expected target long-run path according to economic theory) of number of tourist visits; V_t is the actual number of visits; and IN_t is the real income per capita. For the simplicity, we referred to Utkulu's (1994) study to explain the theoretical background, however, we will use our own assumption (V_i=number of visits, IN=income, EX=exchange rate, etc.) to test cointegration and to do error-correction mechanism in model selection.

V_t*, follows, at each instant, an equilibrium path, then by definition from equation (13) :

$$V_t^* - \beta IN_t = 0 \qquad \text{eq (14)}$$

In short, one would not expect V and IN to act in accordance to this equilibrium at every point in time, and thus even if equation (13) correctly specify an equilibrium relationship, eq(14) will not hold at all instants. Let stochastic variable u_t represent deviations of V_t from its long-run path V_t* ; that is

$$\text{error correction mechanism (ECM)} = V_t - V_t^* = V_t - \beta IN_t = u_t$$

or

$$V_t = \beta IN_t + u_t \qquad \text{eq (15)}$$

where $u_t \sim I(0)$

Within the cointegration framework, u_t in eq(15) is regarded as deviations from the long-run equilibrium path (e.g. see Granger, 1993).

Eviews is a well structured programme for unit root tests and almost all options mentioned here are available in this software programme. We used Eviews and followed the method of the ADF to test stationarity of approximately 256 data series in natural logarithms and quarterly data from 1976 to 1995. The diagnostic statistics for normality, serial correlation, heteroscedasticity, etc. from the ADF regression gave us satisfactory results.

Utkulu (1994) has also emphasised that "structural changes (breaks)" in a time series can affect the integration level of the series. In short, a structural break in the mean level is a sort of exogenous intervention in the series. See Perron (1990) and Charemza and Deadman (1997) for more details.

It is important to note that, with the Perron integration test, we are not testing the presence of a structural break. Instead, we test whether the order of integration is changed by the structural break. This is, of course, more complicated when the seasonal aspects of the data exist both for the integration and the cointegration tests.

Our empirical results suggest that all variables are nonstationary in levels. Most of our series are found to be integrated of order one I(1) and a small number appeared to be integrated of order two I(2).

6.5 Cointegration

Cointegration as a concept was introduced by Granger (1981) and the formal definition was developed by Engle and Granger (1987) and is as follows :

The components of the vector X_t are said to be cointegrated of order d, b, denoted $X_t \sim VI(d, b)$, if all components of X_t are I(d); (ii) there exists a vector α ($\neq$ 0) so that $Z_t = \alpha' X_t \sim I(d - b)$, $b > 0$. The vector α is called the cointegrating vector.

$$V_t = \beta, IN, CL, EX, FF, S^{10} \qquad eq(16)$$

[10] V=No of visits
IN=Income
EX=Exchange rate
CL=Cost of living
FF=Air fares
S=Surface travel cost

6.5.1 Error-Correction Mechanism: ECM

The error-correction mechanism within the cointegration framework constitutes a case of systematic disequilibrium adjustment process through which C_t and Y_t are prevented from "drifting too far apart".

It is shown by Engle and Granger (1987) that any cointegrated series have an error-correction representation. According to the *Granger Representation Theorem* (GRT) the reverse is also true, in that cointegration is a necessary condition for ECM to hold.

As a result in practise, for V_t and IN_t to be cointegrated, it is required that :

a) the two series are integrated of the same order

b) there is a linear combination of the two series which is integrated of order zero, denoted

$$u_t = (V_t - \beta IN_t) \sim I(0) \qquad eq(17)$$

In our case, as we mentioned before, the number of variables involved in the long-run relationship is more than two, which means that the problem becomes more complicated. Charemza and Deadman (1997, p.148) mentioned that in a multivariate context if variables in a long-run economic relationship are of a different order of integration (e.g. V(I(1)), IN(I(1)), EX(I(2)), CL(I(2)), FF(I(1)) and S(I(2)) and the order of integration of the dependent variable is lower than the highest order of integration of the explanatory variables, then there should be at least two explanatory variables integrated of this highest order if the necessary condition for stationarity of the error term is to be met. This means we cannot use two I(2) variables as we mentioned above. According to Johansen cointegration test, all variables should have the same order of integration for VAR[11] estimation.

[11] VAR stands for Vector Autoregressive Estimation.

It is also possible to discuss causality since the existence of cointegration has some "causal" implications as well. But, we prefer not to be involved in causality in this study.

6.5.2 Testing for cointegration

Let us consider an equation in which the number of visits (V_t) is a function of income (IN)

$$V_t = \beta\, IN_t + u_t \qquad \text{(eq18)}$$

We must remember from Engle and Granger (1987) that the integration level test (step 1) reveals that V_t and IN_t are integrated of order one. This implies that the first condition for two variables to be cointegrated is met. The critical requirement for the existence of cointegration is that residuals from the estimated cointegrating regression should be integrated of order zero. In this case, the integration level tests such as DF/ADF can be utilised to check whether the estimated residuals, $\hat{u}_t$, from eq(18) are stationary. The Cointegrating Regression Durbin-Watson (CRDW) test is another test that may still be used as a rough and ready method of evaluating the existence of cointegration.

The CRDW is computed in exactly the same way as the usual DW statistic and expressed as :

$$CRDW = \frac{\sum_{t=1}^{n}(\hat{u}_t - \hat{u}_{t-1})^2}{\sum_{t=1}^{n}\hat{u}_t^2} \qquad \text{(eq19)}$$

where $\hat{u}_t$ denotes the estimated OLS residuals from the cointegrating regression eq(18). The appropriate critical values for the CRDW test are reported by Engle and

Granger (1987) and Engle and Yoo (1991).The main rule is that the null hypothesis of no cointegration is not rejected.

If CRDW > R^2, the null of no cointegration is more likely to be rejected (Banerjee et all., 1986). Utkulu also proposed that under the null of no cointegration , CRDW should be close to zero and hence the null is rejected if the statistics exceed the corresponding critical values.

The "Residual-Based" tests are the first group of cointegration tests which have been suggested in the literature. They are based on residuals of single and static cointegrating regression. The residual based DF/ADF tests[12] suggested by Engle and Granger (1987) are the most widely used ones. These are briefly as follows :

$$\Delta \hat{u}_t = \lambda \hat{u}_{t-1} + \varepsilon \quad \text{(DF)} \qquad \text{eq(20)}$$

$$\Delta \hat{u}_t = \lambda \hat{u}_{t-1} + \sum_{i=1}^{k} \psi_i \; \Delta \hat{u}_{t-1} + \varepsilon_t \quad \text{(ADF)} \qquad \text{eq(21)}$$

From the above models, we come to the conclusion that $\hat{u}_t$ is the estimated OLS residual and it is interpreted as the deviation of C_t from its long-run (equilibrium) path. C_t and Y_t are said to be cointegrated if $\hat{u}_t \sim I(0)$. We should always take into consideration that we have the null of no cointegration against the alternative of cointegration. Therefore, the null should be rejected for C_t and Y_t to become cointegrated. There are also other residual-based cointegration tests developed recently, i.e. Phillips and Quliaris (1990) developed the PO test. However, we prefer not to go into detail.

The "System-Based" tests are the second group of cointegration tests which are applied with systems of equations. In this case, the unique cointegrating vector assumption of the single equation residual-based DF/ADF tests is not valid anymore. If there are N variables, there can be at most r = N-1 cointegrating vectors. In our case we try to test V_t as dependent and IN, CL, EX, FF as

[12] Engle-Granger test by Mac Kinnon.

independent variables. Our cointegrating vector mostly is r = 5-1 (r = 4). The Johansen maximum likelihood approach[13] has dominated the relevant literature. Critical values for the Johansen test can be found in Johansen (1988) and EVIEWS (econometric computer software) can easily deal with the rest of the sophisticated work. It is a well structured programme in which Johansen cointegration tests and vector error correction estimation can easily be obtained. However, it might be more appropriate to use system-based cointegration tests as a supplementary tool, testing the validity of the residual-based test results, since Engle-Granger was criticised by Ghatak, Milner and Utkulu (1997) that has many shortcomings as such it assumes uniqueness of cointegrating vector. In a multivariate context, the number of cointegrating vectors could be more than one. Another shortcomings of the Engle Granger method is that, due to non-normality of the distribution of the estimators of the cointegrating vector, no sensible judgement can be made about the significance of the parameters.

We will use the Johansen (1991) *Maximum Likelihood Estimation* method and we will test the likelihood ratio statistics to see whether cointegrating equations are rejected or accepted. But, of course, there will only be limited test results in the thesis since our research consists of many series and a lot of combinations. It is possible see all details in the Annex which is the second volume of this thesis. It should also be noted that the Johansen method has the main advantage that it enables one to determine the number of existing cointegrating relationships among the variables in hand. As we mentioned earlier, single equation-based approaches assume the uniqueness of the cointegrating vector.

6.5.3 Modelling cointegrated series

ECM (error correction mechanism) is a method to formulate and estimate a model. This is due to prevent the residuals in the long-run relationship not to become larger and larger. For both long-run and short-run equations, there are number of error correction models available in the literature.

---

[13] Johansen (1988, 1991); Johansen and Juselius (1990)

6.5.3.1 Estimation: The Engle Granger two-step method (ECM)

The Engle-Granger two-step method is originally designed by Engle and Granger[14] (1987) and has received a great deal of attention during the last decade. The first step consists of estimating the long-run equilibrium relationship (i.e. $y_t = \lambda\ x_t$) which is static whereas the second step is the estimation of the dynamic relationship ($\Delta\ y_t = -\rho_1\ u_{t-1}$ + lagged $(\Delta\, y,\ \Delta\, x)\ + \varepsilon_{1t}$) or ($\Delta\, x_t = -\rho_2\ u_{t-1}$ + lagged $(\Delta\, y,\ \Delta\, x) + \varepsilon_{2t}$) using the lagged residuals (OLS), i.e. the difference between the estimated y_{t-1} and actual y_{t-1} from the first step. This approach is attractive for two reasons. First, it reduces the number of coefficients to be estimated and so reduces the problem of multicollinearity. Second, the first step can be estimated by ordinary least squares and has been shown by Stock (1987) to provide "super-consistent" estimators (i.e. estimators which converge on the true but unknown population parameters with an order of convergence of $1/\sqrt{n}$, where n is the number of observations). This implies that the OLS estimators converge on the true values at a faster rate in the non-stationary than in the stationary case. For details, see Holden and Thomas (1992).

Statistical testing of the latter approach is concentrated on standard tests such as R^2, "t"-tests for the estimated coefficients, etc. For estimating of the first step in the Engle and Granger approach, the key test is whether the residuals from the estimated equation are I(0) with R^2 only being important as an indicator of the degree of bias. If the residuals are I(0) then the estimated equation is satisfactory and the variables are cointegrated. It should also be noted that the estimators of the standard errors of the first-step equation are biased and therefore no importance can be attached to the standard statistical tests on R^2 or "t" values of the estimated coefficients unless a correction is applied to eliminate the bias.

[14] Granger representation theorem

It is important to note that, in the second step of the ECM, there is no danger of estimating a spurious regression because of the stationarity of the variables. The second step of the ECM is built similarly to the one of Sargan (1964) and DHSY(1978) with the exception that the error correction term is given by the lagged values of the error terms from the first step cointegration regression. As Utkulu (1994) pointed out, the combination of the two steps provides a model incorporating both the static long-run and the dynamic short-run components.

It is also claimed that the two-step approach has the advantage that estimation of the two steps is quite separate so that changes in the dynamic model do not enforce re-estimation of the static model obtained in the first step. This is particularly true in the case of systems estimation when changes in the specification of one equation require re-estimation of the whole system. As such it offers a tractable modelling procedure. On the other hand, it has been criticised in the sense that the estimate of the cointegrating regression equation has rather poor finite sample characteristics. For details see Banerjee et all (1986), Engle and Yoo (1989).

In the second step all the variables and the residuals are supposed to be I(0) provided that the model is properly specified. Therefore, in practice, most practitioners seem to prefer the latter one due to its simplicity.

6.5.3.2 Engle-Yoo three-step modelling approach

In an alternative attempt to reduce the bias caused by the classical two-step approach, Engle and Yoo (1991) suggested a three-step procedure which is asymptotically equivalent to the maximum likelihood estimation. The two major problems of the two-step EC procedure are briefly explained by Utkulu (1994) as :

(i) Although the long-run static regression gives consistent estimates, they may not be fully efficient.

(ii) Due to non-normality of the distribution of the estimators of the cointegrating vector, no sensible judgement can be made about the significance of the parameters.

The third step corrects the parameter estimates of the first step so that standard tests, such as the t-test, can be applied. For further details see Engle-Yoo (1991). Ghatak, Milner and Utkulu (1997) implemented the same approach to make more sensible judgements on the significance of the explanatory variables in their model. This type of research gave them a chance to be more specific on what categories of export (i.e. manufactured products, fuel or non-fuel primary products) are the driving forces of the export led growth for the Malaysian case. Apart from the Engle-Yoo three-step method, there is the Saikkonen (1991) approach which suggests a new asymptotically efficient estimator which is straightforward to compute using OLS without any initial estimation. The main idea behind Saikkonen (1991) is essentially to remove the asymptotic inefficiency of the OLS estimator by using all the stationary information of the system to explain the short-run dynamics of the cointegration regression.

6.5.3.3 Estimation: The Johansen Method (Maximum Likelihood Method (VAR model))

The approach suggested by Johansen (1988) can be used for two purposes :

(i) for determining the maximum number of cointegrating vectors for the variables of interest, and

(ii) for obtaining the maximum likelihood estimates of the co-integrating vector and adjustment parameters. This is achieved by employing canonical[15] correlation methods and utilising the eigen values and eigen vectors revealed by the matrix of correlation coefficient.

[15] Canonical correlation may be defined in the following manner. Given two sets of data defined by the matrices $Y= (Y_{1,}, Y_2,...,Y_r)$ and $X= (X_1, X_2,..., X_8)$ where r <= s, the object of the procedure is to find those linear combinations of Y and X which show the highest degree of correlation (see Gujarati 1992).

Due to the existence of VAR modelling in the Johansen approach (Johansen (1988, 1991)), the concept of cointegration becomes very complex and sophisticated to understand and too difficult to compute. The simplified version is given below. Let us assume that the vector of variables V has the following representation :

$$V_t = \sum_{i=1}^{m} \mathbb{N}_i V_{t-i} + E_t \qquad \text{eq (22)}$$

Where V_t contains all n variables of the model and E_t is a vector of random errors. This model can also be represented in the form :

$$\Delta V_t = \sum_{i=1}^{m-1} \Gamma_i V_{t-i} + \Pi V_{t-m} + E_t \qquad \text{eq(23)}$$

where $\Gamma_i = -I + \mathbb{N}_1 + \mathbb{N}_2 + ... + \mathbb{N}_i$ (I is a unit matrix)

$$\Pi = -(I - \mathbb{N}_1 - ... - \mathbb{N}_m) \qquad \text{eq(24)}$$

Matrix Π can be represented in a form as such :

$$\Pi = \alpha . \beta', \qquad \text{eq(25)}$$

where α and β are both $n \ x \ r$ matrices. Matrix β is called the *cointegrating matrix* and matrix α is named as the *adjustment matrix* or the *feedback matrix.*

The Johansen method makes it easy to estimate the cointegrating vector directly, and also to construct tests for order of cointegration. It is important to note that in VAR model explaining N variables there can be at most $r = N - 1$ cointegrating vectors. One advantage over Engle-Granger, the statistical properties of Johansen procedure are generally better in and cointegration test is of higher power. It is, of course, difficult to compare them directly, since both are grounded within different econometric methodologies. For single equation modelling as a supplementary tool, the Johansen method is the right approach. It is good for testing the validity of the endo-exogenous variable division. It is also a confirmation test of the single equation model.

Besides the theoretical advantages and superiority, the Johansen method has some shortcomings as such; with a small sample size it cannot be regarded as an appropriate method since the point estimates obtained for the cointegrating vector β, may not be particularly meaningful. Apart from this, some additional problems may occur if we don't have a unique cointegration vector. Some problems may also be seen when the multiple long-run relationship is presumably best seen as an identification problem. There are ways to overcome this problems as like rejecting all but one such cointegrating vector as economically meaningless or alternatively looking for consistent models in the economic theory that consists two or more single equations.

6.6 Forecasting:

Until now not many quarterly estimation has been done in this field, especially for cointegration analysis which we aim to do in the next chapter. Very recently, Kulendran (1996) and, Kulendran and King (1997) have contributed to the literature with tourism demand model which is also built on Witt and Martin (1987) econometric model. Therefore, we would like emphasise that it is new to use cointegration in tourism. No one applied cointegration of tourism demand to particular countries (i.e., N. Cyprus, Malta, The Isle of Man etc.). It is important to note that our study is the only study which is based on small island states and consists quarterly basis data. This is therefore believed to bring better economic understanding when researchers are interested in seeing long-run economic relationship. It is also a unique study which gives comparative idea between large countries and small countries.

These regression equations will help to identify the main determinants of tourism demand. In addition, they may prove useful for forecasting purposes. To assess this the forecasts produced by the regression equations are compared to those from time series based approaches.

When we are judging the most accurate forecasts from the outcomes, comparisons will be made of forecasts made over particular time horizons. We have seen there are a number of alternative criteria for measuring forecast accuracy - RMSE, MSE, MAE, MSPE, TIC, etc. which can give different rankings so that there is no guarantee that a method that performs well under one criterion is satisfactory under the others. The result is that any conclusion from a given data set should be regarded only as indicators of forecasting ability and not as proof of the correctness or otherwise of the underlying model.

Whereas those using RMSE have argued that large errors should be more heavily penalised. On the other hand, those using MAPE have usually stressed the importance of the use of a standardised measure to facilitate comparisons among flows of differing sizes. It was decided to calculate and use MAPEs in the analysis, as it was felt that it would be interesting to see if the conclusions regarding the ability of various methods to forecast accurately differed when another measure was used, which, although allowing comparisons across differing sizes of flows, did not penalise large errors. Besides RMSE, MAPE also possesses the attribute that it has been used widely in the past, and thus comparisons of how the accuracy of tourism forecasts in this thesis compare with other forecasts or forecasting classification may be made. However, after we obtain the outcomes of our study, the RMSE has shown the superiority among others with its lowest errors, therefore, we decided to present our forecasting ranks under RMSE.

Several alternative measures of forecasting performance are used in the literature. Holden, Peel and Thomson (1994) emphasised that MSE is probably the most popular descriptive measure among others. If we denote the forecast by F_t and the outcomes or actuals by A_t , the mean square error for n forecasts and outcomes is defined as

$$MSE = \frac{1}{n}\sum_{t=1}^{n} e_t^2$$

or

$$MSE = \Sigma\,(F_t - A_t)^2 / n$$

Because the errors are squared, large errors are given extra weight when MSE is calculated. Thus the cost of making positive and negative errors is assumed to be the same and varies with the size of the error.

An alternative way of expressing the MSE is to let e_t be the forecast error or F_t - A_t then, suppressing the subscript t,

$$MSE = \frac{\Sigma e^2}{n} = \frac{\Sigma(e - \bar{e} + \bar{e})^2}{n}$$

$$= \frac{\Sigma(e - \bar{e})^2}{n} + \bar{e}^2$$

The first term is the variance of the forecast error and the second is the square of the mean. Therefore MSE is an increasing function of the variance and mean of the error. Since, like the variance, the units of MSE are the squares of the units of F_t it is common to take its square root to give the root mean square error (RMSE), defined by

$$RMSE = \sqrt{\frac{\Sigma(F_t - A_t)^2}{n}}$$

Often the square root of the MSE, RMSE, is considered, since the seriousness of the forecast error is then denoted in the same dimensions as the actual and forecast values themselves.

Other descriptive measures of forecast accuracy are the mean absolute error (MAE)/mean absolute deviation (MAD), and mean absolute percentage error

(MAPE). Theil inequality coefficient (TIC) is also widely used forecast accuracy in the literature.

6.6.1 Mean absolute deviation/mean absolute error

The mean absolute deviation (MAD) or mean absolute error (MAE) is a measure of overall accuracy which gives an indication of the degree of spread, where all errors are assigned equal weights.

$$MAD\ or\ MAE = \frac{1}{n}\sum_{t=1}^{n}|e_t|$$

where $|e_t|$ denotes the absolute value of the error and n denotes the number of forecast.

6.6.2 Mean absolute percentage error

Mean absolute percentage error (MAPE) is the relative measure which corresponds to the MAE, and is given by

$$MAPE = \frac{1}{n}\sum_{t=1}^{n}\frac{|e_t|}{V_t} * 100$$

Lewis (1982) said that the MAPE is a most useful measure in comparing the accuracy of forecasts between different items or products since it measures relative performance.

If the MAPE calculated value is less than 10 percent, it is interpreted as highly accurate forecasting, between 10 - 20 percent good forecasting, between 20 -50 percent reasonable forecasting and over 50 percent inaccurate forecasting (see Lewis (1982, p.40 for more details).

On the other hand, Choy (1984) used MAPE in his paper which was related with the accuracy and efficiency of forecasting techniques by applying time series regression to forecasting visitor arrivals to the Asia/Pacific region and Hong Kong. He actually compares a naïve forecast with a simple time-series regression. Relative accuracy of time series regression for each forecast area is presented in terms of MAPE and the percentage increase in accuracy of the time series forecast over naïve forecasts. You may find the obtained results and comments more deeply in his paper.

6.6.3 Theil's *U* or Theil's Inequality Coefficient

Theil's inequality coefficient (Theil, 1966) is another statistical measure of forecast accuracy. One specification[16] of Theil's *U compares the accuracy of a forecast* model to that of a naïve model, which simply uses the actual value for the last time period (Y_t) as a forecast for $\hat{Y}_{t+1}$. That is $\hat{Y}_{t+1} = Y_t$ for each time period.

The formula for Theil's *U* is

$$U = \frac{\text{RMSE of the forecasting model}}{\text{RMSE of the naïve model}}$$

A Theil's *U* greater than 1.0 indicates that the forecast model is worse than the naïve model; a value less than 1.0 indicates that it is better. The closer *U* is to 0, the better the model. In practice, values of 0.55 or less are very good (Lindberg,1982; McNees,1979).

There is a different computational formula which is discussed by Gaynor and Kirkpatrick (1994) with a formula such as:

$$U = \frac{\text{standard error of the forecasting model}}{\text{standard error of the naïve model}}$$

This formula requires that we generate the naïve forecast, compute its standard error, and compare it with the standard error of the forecasting model. As you will recall, the values for Theil's *U* range from 0 (no forecast error in the model) to greater than 1 (forecast model performs worse than the simple naïve model). In actuality, the inequality coefficient uses three different derivations of the above formula, each of which is useful in different situation. An alternative method

[16] There are several variations of Theil's U inequality. This particular formulation can be thought of as the naïve Theil's U because it is based upon comparison of one forecast model with the naïve forecast.

proposed by Armstrong (1985) was used again by Gaynor and Kirkpatrick (1994) which seems to have its advantages. In this method, it is not necessary to generate the forecast for the naïve model and compute their errors. Therefore an alternative formulation is adopted for calculations that can give the forecast accuracy.

The alternative method for computing Theil's U is

$$U = \frac{\sqrt{\frac{1}{n}\sum_{t=1}^{n}(\hat{Y}_t - Y_t)^2}}{\sqrt{\frac{1}{n}\sum_{t=1}^{n}\hat{Y}_t^2} + \sqrt{\frac{1}{n}\sum_{t=1}^{n}Y_t^2}}$$

where $\sum_{t=1}^{n}(Y_t - \hat{Y}_t)^2$ = the sum of the squared forecast errors;

$\sum_{t=1}^{n}\hat{Y}_t^2$ = the sum of the squared forecast values $\hat{Y}_t$;

$\sum_{t=1}^{n}Y_t^2$ = the sum of the squared actual values Y_t .

It is now possible to use the complete sample estimation period *n*, rather than *n-1*, for the calculation of the Theil's *U*. The numerator of the preceding formula is the RMSE of the forecast model.

The analysis of *U* remains the same in either method. There is one difference in that the bounds of Theil's *U* are now 0 (lower limit) and 1 (upper limit). Once again, the closer U is to 0, the better the model. Conversely, if *U*=1, the model is as bad as it could be!

Finally, we found RMSE to be the best measure among the others for our study.

6.7 Conclusion

We used cointegration analysis in this chapter to model the international tourism demand. The advantage of using cointegration analysis in tourism demand modelling is that this methodology overcomes the problem of "spurious regression" associated with traditional econometric work. If the unit root tests indicate that the economic variables are stationary, tourism demand models can be estimated by regression analysis. When the economic variables are non-stationary, cointegration analysis should be considered to estimate tourism demand models.

The augmented Dickey-Fuller unit root test proposed by Dickey-Fuller (1981) suggest that the tourist arrivals from origin to destination countries are non-stationary. It is implemented by EVIEWS ADF test including trend and intercept variables at 4 lags. Some series achieved at stationarity level at first difference, however, some needed second differencing. You can see the details in Table-7.5 in chapter 7. Therefore, having identified that the economic variables are non-stationary, Johansen's Maximum Likelihood technique was found to be the best to estimate long-run elasticities. However, Engle-Granger's two step and Engle-Yoo's three step modelling were found to be not preferable due to having some shortcomings. Johansen Maximum Likelihood is preferable to others because it is good for large sample sized data and the number of cointegrating vectors may be more than one, since more than two variables involved in each cointegrating regression. Because the EG approach assumes the uniqueness of the cointegrating vector, we need to employ a system-based Johansen method to check the number of cointegrating vectors. The other reason is the OLS long-run estimates that may be remarkably biased. The last reason is because of the resulting t-statistics which may not be valid due to nonnormality of the distribution.

Although the existence of multiple cointegrating vectors is regarded as an identification problem for single equation cointegrating estimation, this problem, in practise, may be solved by choosing the particular cointegrating vector where the long-run estimates correspond closely (in both magnitude and sign) to those predicted by economic theory and also to those obtained by some other alternative long-run estimation techniques.

Charemza and Deadman (1997) emphasised that while using the cointegration tests; it is not precise that the relationship is really a long-run one, on the contrary it is an assumption supported by relevant economic theory and cannot be statistically verified. In this sense, whether or not cointegration exists is an empirical question, but beliefs of economists appear to support its existence. Cointegration simply provides a formal framework for testing long-run economic relationships from actual time series data. In the literature, cointegration tests have been implemented on various fields of economic theories, such as; international tourism demand, exchange rate, purchasing power parity, export-led growth, and money markets.

Lastly we will try to judge the most accurate forecasts from the outcomes in the next chapter over particular time horizons.

CH 7: Empirical Findings

7.1 Regression Results

Using an econometric model to estimate tourism demand is very important for this study because, we are interested in seeing group of variables which influences international tourist arrivals from an origin country to a destination country. Demand estimation is important for tourism of N. Cyprus. Since we are dealing with small island states, especially N. Cyprus, it may be important to select a regression model that will show the effect of supply constraints demand situation. North Cyprus is facing insufficient bed spaces, airline transportation, infrastructure etc. Therefore, a model including lagged dependent variable is inevitable which is expected to pick up the changes in supply constraint situation. From our survey, we found Witt and Martin (1987a) tourism demand model suitable for our study.

The modifications we intended to do is to include income per capita as an explanatory variable rather than disposable income because of the lack of availability of quarterly data. We excluded substitute variables from the original model either due to potential multicollinearity problems or the lack of data availability. Another important modifications we made in our model is to exclude ferry fares variable since we face the lack of data from many countries. Lastly, we aimed to use quarterly data rather than annually for 1976-1995 period and also included seasonal dummies in our regression model. No such a long run quarterly study has been done on particular countries we are concerning therefore, ours will be new contribution for the literature.

The tables displayed below indicate the regression models (coefficient elasticities before adjustments) and best regression models (coefficient elasticities after diagnostic tests) for the selected inbound tourist destinations.

Table 7.1 Regression Models for Malta

Origin	Dest	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	ln V_{t-4}/P_{t-4}	Trend	R^2	$\bar{R}^2$	DW
Austria	Malta	-39.509	7.250	-0.674	4.650	-7.477	0.902	0.586	-0.972	0.526	-0.367	-0.022	0.108	-0.017	0.900	0.881	1.811
		(-3.718)	(3.593)	(-0.486)	(2.730)	(-1.544)	(1.643)	(3.474)	(-2.748)	(0.951)	(-2.102)	(-0.128)	(0.894)	(-1.680)			
Denmark	Malta	-0.432	0.759	0.006	0.923	-8.021	0.972	0.199	-0.515	0.461	-0.296	-0.271	0.549	-0.014	0,841	0.811	1.172
		(-0.110)	(1.077)	(0.007)	(1.133)	(-2.488)	(5.072)	(2.301)	(-3.282)	(2.189)	(-1.975)	(-1.901)	(4.799)	(-2.288)			
Germany	Malta	-6.239	0.894	-1.647	-0.182	-1.488	-0.070	0.193	-0.440	0.490	-0.171	-0.099	0.461	0.018	0,964	0.958	1.838
		(-2.610)	(1.657)	(-2.644)	(-0.325)	(-1.002)	(-0.274)	(2.693)	(-3.209)	(2.836)	(-1.667)	(-0.954)	(4.168)	(4.425)			
Italy	Malta	3.907	-0.020	1.188	0.176	-4.368	-0.295	0.739	-2.259	2.575	-0.114	-0.012	0.106	0.037	0,969	0.964	1.902
		(1.062)	(-0.049)	(4.887)	(0.439)	(-1.736)	(-1.686)	(6.195)	(-6.631)	(6.431)	(-1.254)	(-0.133)	(0.830)	(5.735)			
Libya	Malta	7.070	-0.096	-1.737	0.451			-0.088	-0.149	0.232	-0.160	-0.311	0.450	0.017	0,658	0.599	1.952
		(1.585)	(-0.276)	(-2.392)	(0.702)			(-0.978)	(-0.856)	(0.962)	(-0.609)	(-1.192)	(3.778)	(2.428)			
UK	Malta	-5.299	1.520	0.316	1.182	0.201	-0.392	0.557	-1.386	1.704	-0.165	-0.139	0.224	0.005	0,880	0.857	1.548
		(-2.799)	(2.692)	(0.523)	(1.434)	(0.094)	(-1.037)	(5.749)	(-6.524)	(6.257)	(-1.395)	(-1.238)	(2.227)	(1.519)			
USA	Malta	-12.039	2.489	-1.443		9.507		0.226	-0.489	0.603	-0.083	-0.097	0.647	-0.012	0.841	0.816	0.994
		(-3.437)	(3.347)	(-2.357)		(4.567)		(2.950)	(-3.180)	(3.034)	(-0.673)	(-0.964)	(7.119)	(-3.743)			

Table 7.2 Best Regression Models for Malta

Origin	Dest	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	ln V_{t-4}/P_{t-4}	Trend	R^2	$\bar{R}^2$	DW	CO/ OLS
Austria	Malta	-35.659	6.893		4.510	-7.321		0.360	-0.542		-0.364		0.251	-0.023	0.891	0.879	1.802	OLS
		(-5.674)	(5.729)		(5.459)	(-2.725)		(4.706)	(-6.046)		(-2.264)		(2.640)	(-3.916)				
Denmark	Malta	1.261				-5.953		0.262	-0.710	0.644					0.846	0.836	1.798	CO
		(1.701)**				(-2.634)		(4.489)	(-6.387)	(4.240)								
Germany	Malta	-6.699	1.076	-1.649		-2.237		0.186	-0.438	0.477	-0.183		0.472	0.018	0.964	0.959	1.843	OLS
		(-3.338)	(3.277)	(-4.472)		(-1.879)**		(2.678)	(-3.241)	(2.850)	(-1.968)		(4.502)	(5.594)				
Italy	Malta	-3.154	0.195				-0.274	0.499	-1.508	1.742	-0.298		0.412	0.010	0.961	0.957	1.912	OLS
		(-3.994)	(1.626)***				(-1.734)**	(4.721)	(-5.199)	(5.052)	(-3.236)		(3.892)	(5.304)				
Libya	Malta	6.913		-1.892				-0.163					0.404	0.019	0.636	0.610	1.877	CO
		(3.026)		(-2.969)				(-3.214)					(3.937)	(3.233)				
UK	Malta	-4.444	1.233		1.462		-0.600	0.565	-1.419	1.737			0.182	0.004	0.873	0.855	1.964	CO
		(-5.115)	(5.516)		(2.204)		(-1.941)**	(6.443)	(-7.127)	(6.871)			(1.882)**	(1.416)***				
USA	Malta	-14.408	2.692					0.327	-0.740	0.899	-0.219	-0.174	0.458	-0.007	0.887	0.871	2.028	CO
		(-3.430)	(2.878)					(5.150)	(-5.391)	(5.258)	(-1.939)**	(-1.651)**	(4.916)	(-2.005)*				

Notes :
The figures in brackets are t-values.
* indicates significance at 5% level.
** indicates significance at 10% level.
*** indicates significance at 20% level.

Table 7.3 Regression Models for N. Cyprus

Origin	Destination	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	ln V_{t-4}/P_{t-4}	Trend	R^2	$\bar{R}^2$	DW
Turkey	N. Cyprus	-3.030	0.858	0.084	-0.300	31.065	-0.686	0.120	-0.342	0.333	-0.447	-0.333	0.154	0.083	0.808	0.742	1.650
		(-0.433)	(0.717)	(0.896)	(-0.191)	(2.580)	(-2.225)	(1.190)	(-1.597)	(0.986)	(-3.159)	(-2.558)	(1.163)	(2.367)			
UK	N. Cyprus	-8.501	1.182	-0.050	-0.200		0.329	0.710	-1.710	2.249	-0.165	-0.475	0.243		0.936	0.918	1.772
		(-2.652)	(1.227)	(-0.570)	(-4.182)		(0.494)	(4.704)	(-5.015)	(4.803)	(-1.327)	(-3.806)	(1.784)				
Germany	N. Cyprus	-9.478	1.313	0.099	-0.111		-1.797	0.627	-1.322	1.736	-0.045	-0.536	0.299		0.904	0.878	1.461
		(-4.722)	(3.800)	(0.816)	(-2.151)		(-3.014)	(3.373)	(-3.411)	(3.055)	(-0.260)	(-3.177)	(2.277)				
USA	N. Cyprus	-20.486	3.638	0.272	0.334			0.399	-0.630	0.734	-0.483	-0.926	0.256	0.020	0.725	0.651	1.860
		(-1.549)	(1.226)	(1.826)	(1.242)			(2.065)	(-1.533)	(1.150)	(-2.178)	(-4.484)	(2.042)	(0.630)			
Australia	N. Cyprus	-8.666	0.325	-0.100	-0.192			0.616	-1.509	1.876	-0.293	-1.597	-0.037	-0.021	0.493	0.356	1.864
		(-1.781)	(0.285)	(-0.336)	(-0.375)			(2.053)	(-2.309)	(1.756)	(-0.724)	(-4.223)	(-0.273)	(-0.337)			
Turkey	N. Cyprus	-1.120	0.356	0.011	-0.367	4.321	-0.384	0.136	-0.353	0.361	0.026	-0.325	0.444	0.047	0.900	0.879	1.506
		(-0.365)	(0.660)	(0.251)	(-0.549)	(1.076)	(-3.087)	(2.116)	(-2.575)	(1.766)	(0.199)	(-3.106)	(3.870)	(2.893)			

Table 7.4 Best Regression Models for North Cyprus

Origin	Destination	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	ln V_{t-4}/P_{t-4}	Trend	R^2	$\bar{R}^2$	DW	CO/OLS
Turkey	N. Cyprus	-4.465	0.562				-0.645	0.208	-0.638	0.762	-0.532	-0.340			0.751	0.711	1.602	OLS
		(-5.492)	(2.307)				(-2.951)	(2.352)	(-4.137)	(3.466)	(-4.360)	(-2.845)						
UK	N. Cyprus	-5.669	0.958					0.503	-1.184	1.524			0.439		0.900	0.886	2.177	CO
		(-2.641)	(1.862)**					(3.741)	(-3.820)	(3.828)			(3.286)					
Germany	N. Cyprus	-10.728	1.475				-1.416	0.775	-1.677	2.271	-0.677	-0.371	0.219	0.015	0.908	0.886	1.433	OLS
		(-5.358)	(4.272)				(-2.535)	(4.416)	(-4.794)	(4.750)	(-4.445)	(-2.214)	(1.751)**	(2.698)				
USA	N. Cyprus	-23.371	4.214		0.137			0.544	-1.062	1.524	-0.377	-0.975	0.248		0.700	0.639	1.915	OLS
		(-2.060)	(1.599)***		(1.351)***			(3.315)	(-3.519)	(3.653)	(-2.145)	(-5.504)	(2.318)					
Australia	N. Cyprus	-6.835						0.497	-1.197	1.353	-1.551				0.460	0.400	1.956	CO
		(-38.103)						(2.385)	(-3.095)	(2.530)	(-4.125)							
Turkey	N. Cyprus	-3.238	0.672				-0.457	0.131	-0.393	0.415	-0.279		0.368	0.031	0.884	0.871	1.445	OLS
		(-6.573)	(5.890)				(-4.393)	(2.225)	(-3.435)	(2.711)	(-2.824)		(4.003)	(3.973)				

Notes :
The figures in brackets are t-values.
* indicates significance at 5% level.
** indicates significance at 10% level.
*** indicates significance at 20% level.

7.1.1 Interpretations of Regression Results

There are four tables illustrated above; in which two of them indicate the regression results before adjusting diagnostic tests and the other two indicate the best regression models after adjusting econometric problems (e.g., multicollinearity, autocorrelation etc.). As we explained before there are 43 origin countries included in the regression model and two destination countries visited. Full details of all these are shown in volume 2. The tables alone show inbound destinations to North Cyprus and Malta. Witt and Witt (1992) emphasise that where small flows are concerned, the data on which the estimation is based may be less reliable and data errors may contribute significantly to errors. For comparative purposes equations are also estimated for inbound tourist flows to the UK, Austria and Turkey. These results are shown in Appendix. In general they support the findings with respect to price and income elasticities discussed in this chapter. (Tourists from particular origin countries seem to exhibit similar behaviour irrespective of destination.). More accurate forecasts may also be expected with large flows because these flows can only occur for well-established destinations (e.g. the UK and Austria). Large fluctuations in travel to such destinations would not be expected, except if, say, civil war broke out. This is partly due to supply constraints - it takes time to build hotels, and organisational inertia - tour operators have established links with hotels which have developed over time.

7.1.2 Economic Interpretations for Malta

In Table 7.2, the estimated income elasticities for inbound flows to Malta range from 0.195 to 6.893 and in four cases it is greater than one. The lower income elasticity for Italy may be a reflection of lower travel costs. The estimated income coefficients suggest that a 1% increase in real income per capita results in a 6.90%, 1.08%, 0.20%, 1.23% and 2.69% increase in the number of tourist arrivals to Malta from Austria, Germany, Italy, the UK and the USA respectively. All t-statistics given for income coefficients show that they are all significant at 5% significance level except Italy, that it is found significant at 10% significance level. The cost of living variable is used for a proxy for consumer price index and therefore it represents the price elasticity. The price elasticity is greater than one for Germany and Libya. A 1 % increase in the Maltese price level causes 1.65% and 1.89% decrease in the tourist arrivals to Malta from Germany and Libya correspondingly. Both coefficients are found significant at 5% significance level. Because of the multicollinearity problems between cost of living and income variables for Austria, Denmark, Italy, the UK and the USA, cost of living variables are excluded from the best regression models. The exchange rates variable was found significant for Austria and the UK and they have elasticity coefficients above unity. A 1% increase in the exchange rates of Austrian Shillings and the UK pounds results 4.51% and 1.46% increase in tourist arrivals to Malta from Austria and the UK particularly. Air fares and surface transportation costs are price related variables which they both give the price elasticities. For Austria, Denmark, and Germany the air fare variables are found significant. A 1% increase in air fares causes 7.32%, 5.95% and 2.24% decrease in the number of arrivals to Malta from Austria, Denmark and Germany relevantly. The surface cost coefficients are found below unity and elasticity coefficients are representing inelastic price demand for Italy and the UK. A 1% increase in surface travel costs (proxy made from diesel petrol prices - see chapter 5 for details) results 0.27% and 0.60% decrease in tourist arrivals from Italy and the UK to Malta individually. Yet, this is not a strong proxy since we did not include the ferry crossing fares to Malta. However, for central European countries for example, (the tourists travelling from Germany, France, Austria, Belgium, Switzerland to Turkey without ferry crossing or for Austria inbound) surface transportation elasticities are important.

7.1.3 Economic Interpretations for N. Cyprus

The previous analysis focused on Malta with the intention of giving a yardstick to compare North Cyprus. The situation in North Cyprus differs in a number of respects, however. Although both of the islands are situated in Mediterranean sea, the socio-economic and political circumstances of each country represent different pictures.

So as to understand the current position of North Cyprus in tourism, one has to examine the recent history. The political events took place in Cyprus Island from 1960s onward will shed a great deal of light in our understanding of the attractiveness of North Cyprus to the foreign tourists.

As a result of on going political problems between Greek and Turkish communities of the island, North Cyprus is entirely isolated from the world. 1974 war over the island between Greece and Turkey, brought about new political developments for the Turks, yet it did not help them to take their part, officially, in the nations of families in the world. North Cyprus remains as an un-recognised state and is not heard much in the tourism circles because of its undetermined political status. Anyone wish to fly to North Cyprus, has to go through Turkey, and hence any flight set off to North Cyprus has to touch down to Turkish land before landing on North Cyprus as the international regulations require.

North Cyprus, with its historical and scenery beauties including beeches, presents another golden opportunity for world tourism to be explored, yet above mentioned political uncertainties attached to the country as an enigma does not allow that potential to be fulfilled. It is, thus, a fact that political issues discourages people to take their holidays in North Cyprus.

This brings us to another point: the importance of socio-political issues in the decision-making process of economic realities, as tourism is an economic activity despite being a recreational one. Thus, the endogenisation of political circumstances could have been useful in shedding light in our understanding of North Cyprus tourism case. However, we have to acknowledge that that area should remain under the occupation of political economists, and could, possible, be a source of another research inquiry for the future.

Before going any further, its time to analyse the modest results that our research inquiry has produced. Following analyses based on the results depicted on Table 7.3 and Table 7.4. While Table 7.3 presents regression results for N. Cyprus, the latter is the result of best regression for North Cyprus. As the name suggests, Table 7.4 presents a corrected version of certain statistical problems.

As Table 7.4 shows we search for the impact of income (IN), cost of living (CL), exchange rate (EX), air-fares (FF), surface transportation cost (S), Gulf War (1991) as dummy variables together with supply constraint on the number of tourists visiting North Cyprus from Turkey, UK, Germany, USA and Australia. These origin countries are selected on the basis that these constitute the major tourism source for N. Cyprus. The first equation from Turkey to North Cyprus represents the Turkish passengers who stayed in tourist accommodation only and covers the period from 1983 to 1995. The last equation, however, includes all Turkish passengers travelling abroad regarding the luggage traders.

Our regressions produced following estimated income elasticities: Turkey, 0.562; UK, 0.958; Germany, 1.475; USA, 4.214 and Turkey, 0.672. This, in turn, implies that a 1% increase in real income of the citizens of each country brings about increase in the size of mentioned magnitudes in terms of percentage, e.g. a 1% increase in the income of the citizens of Germany brings about 1.475% increase in the number of German visitors to the country. The lower income elasticities associated with Turkey in particular and with the UK are consistent with the results for Malta. However they may be due to the lower travel cost from Turkey to the island, and to the competition in flight fares from London to the island as there is a great number of Turkish Cypriots settled in the UK. Being originally from the island, income may not constitute a major factor in reaching a decision to visit the island for the Turkish Cypriots in the UK. This applies to the citizens of Turkey as they share the same ethnicity together with island being very close to the mainland Turkey.

We can, now, proceed to check the significance of estimated income coefficients for each countries; The result shows that estimated income coefficients are all significant except that it is significant for the UK at 10% and USA at 20% level of significance.

When we compare the regression in Table 7.3 with the Best regression result in Table 7.4, it will clearly be seen that CL, the cost of living variable, was dismissed by the latter. This is due to the fact that in the first model we found a high degree of multicollinearity between cost of living and income variables for each country, and hence, in the corrected version of the regression model inevitably it was excluded. The same applies to EX, exchange rate as well. The second model, as can be seen from the Table 7.4, only produced result for the USA, which is significant only at 20% level of significance. Bearing in mind the above discussion and the countries that are included in our list, it is clear that some of people travelling from the UK, Turkey and Australia are Turkish or Turkish Cypriots and the reason for travel may not be tourism, e.g. people going back to their home town to visit their parents and relatives etc. Similar elasticities result when considering other destinations, however. For the people going from Turkey, again having the same currency, exchange rate does not play any role in their decisions to go to Cyprus. For the people travelling from the USA to North Cyprus, EX has a low significance, and we can interpret that 1% increase in the value of US Dollar brings about 0.137% increase in the number of people visiting North Cyprus.

Air Fares (FF) was dismissed from the best regression after taking into account the corrections which needed to be carried out to overcome certain econometrics problems. Surface transport cost (S) is important for only Turkey and Germany. Many people from Turkey use means other than flights. As far as Germany is concerned, it has been witnessed that for various reasons, Turkish ethnic people from Germany, travels by car or ferries to the island. Although the estimated coefficients for S are low, particularly for Turkey, they are statistically significant. The signs are as expected to be negative. Accordingly, for instance, a 1% increase in surface costs results in 1.416% reduction in the number of visitors from Germany to the island. The impact of any increase on surface cost on the visitors from

Turkey is rather low. Since this measure as a proxy does not include ferry crossing, therefore for the people coming from Turkey, the surface transportation elasticity is not very strong. This is important as most of the people from Turkey travels to the island by ferry.

Seasonality is an important factor to be taken into account in tourism as the number of tourists varies from one season to another. Because, most of the tourism activity in our times based on the desire to have sun and beach, which makes summer season as the most attractive season to visit a holiday resort. Seasonal dummies are used to capture these effect for all destination countries. Although some of the people fly to N. Cyprus, as explained above, is non-tourism motivated, seasonality still is an important factor in our analysis. This suggests tourism flows are being affected, although it may also be Turkish Cypriots from the UK or Australia would visit their relatives and home in North Cyprus during summer season or may be during the Christmas holiday as it is time the schools have their vocations and most of the adults feel it is the right time to have a family vocation. Therefore, we used seasonal dummies to check whether the seasonality is an important or a significant factor in determining the number of tourist visiting North Cyprus.

In order to see the seasonality in demand we used seasonal dummies (D2, D3 and D4). Quarter 2 stands for April, May and June, quarter 3 stands for July, August and September, and quarter 4 stands for October, November and December. Here the seasonal effects are presumed to shift the intercept of the regression function. Note that the quarterly seasonal effects are represented by three, not four, binary regressors; otherwise, the least square estimators of the regression coefficients would be indeterminate. The representation of seasonal effects in our equations involve only three seasonal dummy variables. Using the four seasonal dummies and the constant together would make it impossible to estimate the OLS regression (perfect multicollinearity). The results will remain unchanged when four dummies are used, one for each of the seasons, but, the constant from the regression equation should be dropped. Instead we can count constant as one, and D_2 , D_3 and D_4 as seasonal dummies for quarter 2, 3 and 4 respectively. For the cointegration tests we used seasonally adjusted series instead of using seasonal dummies.

We used dummy variables to capture the significance of seasonal variations; these are D2, D3 and D4, and D1 being constant. As can be seen from the Table 7.4, all the dummy variables are statistically significant, and the magnitude of dummy coefficients for the UK, Germany, the USA and Australia is rather high for D3 and D4. This could be due to long Christmas holidays and mild climate in the Mediterranean region. On the other hand, although there is seasonality between Turkey and North Cyprus, the magnitude of dummy coefficients are not as high as others. This is could be due to the fact that North Cyprus being very close to mainland island is always accessible easily by Turkish people. Secondly, as the last equation refers to the luggage traders from Turkey, there is no much importance of seasonality in their economic activity.

Seasonality in the number of arrivals perfectly expressed in monthly basis and we converted them into quarterly basis. Seasonal fluctuations may vary from one country to another and geographical situation and climate conditions of the country can determine the flows eventually.

We also used break down dummies for the regression equation and the effect of economic, social and political crises are aimed to be interpreted. (1987 wages demonstration and the effects of 1986 economic recession for Austria, 1986 recession for Italy and the USA, 1991 gulf crisis for Germany and 1979 oil shock for the USA; all take the value 1 for the indicated year and 0 otherwise).

The dummy variables for the Gulf War suggests a negative impact on German tourists. This may be because German visitors are more risk averser comparison to British tourist. A similar result is found when looking at German and Austrian visitors to Malta. During the same period, there were no changes in British visiting attitudes to N. Cyprus or Malta. This may be because of several reasons:

- British tourists are less risk averse. This may be because of serious IRA attacks in England for many years which led many British to live with it. They are used to see many unpredictable violence's and try to protect themselves with strong defence and brave determinism. Therefore, British are risk taker in comparison to Germans which are risk aversers.
- British visitors to N. Cyprus may themselves to Turkish Cypriots, with close family ties (see above). Similarly British tourist have cultural ties between Maltese people, because Malta was a colony of Great Britain for many years.
- The life styles in Malta and N. Cyprus is very similar in England which may be another positive effect on British visiting attitudes. Therefore, middle age group and old age group tourist are choosing to visit N. Cyprus and Malta and as they feel themselves part of their host community. Germans as contrary do not have this kind of cultural and social ties.

For different dummies, we can add many comments for different countries that some can be affected and some can not. The oil crisis caused very serious economic and social problems (i.e., unemployment, low level of income, inflation etc..) in America and in some other countries. The reduction in income automatically reduced the living standards of people which caused a major reduction in the number of international visits.

The distance to travel from Europe to N. Cyprus and Malta is shorter to travel from America. Therefore, the oil prices in Europe did not have a great influence on cost of transportation for European airline companies than American companies. American passengers affected negatively during 1986 economic recession whereas Danish and German etc., visitors were not. We can reach to a conclusion that sudden shocks in one countries economy may not affect the other country at the same time, therefore, it only affects some origin countries.

As an example of the impact of the Gulf crisis consider the coefficient of the dummy variable for travel from Germany to Malta. The estimated coefficient of the dummy variable relating to the 1991 Gulf crisis is -0.183. This suggest demand for tourism was only 83% of what it would otherwise have been. This may be shown by focusing solely on the two relevant variables. In 1991

$$\ln V_t/P_t = \ldots -0.183 + \ldots \quad (1)$$

In 1990, i.e. the year before the Gulf crisis

$$\ln V_{t-1}/P_{t-1} = \ \ldots + 0 + \ldots \ (2)$$

as the dummy variable takes the value 1 in 1991 and 0 otherwise.

Subtracting equation 2 from 1 yields

$$\ln (V_t/P_t) - \ln (V_{t-1}/P_{t-1}) \ = -0.183$$

or

$$\ln \ [(V_t/P_t) \ / \ (V_{t-1}/P_{t-1}) \ ] = -0.183$$

Taking antilog

$$(V_t/P_t) \ / \ (V_{t-1}/P_{t-1}) = 0.83$$

Thus a reduction of 17% is indicated. There is also a 30.6%, 25.8%, and 19.7% reduction in demand for tourist flows to Malta from Austria, Italy, and USA respectively as a consequence of wages crisis in Austria during 1987 (DM1), the effects of 1986 economic recession in Italy (DM1) and 1979 oil shock in America (DM1). Similarly, there is 16% reduction in demand for tourist flows to Malta as a consequence of economic recession in 1986(DM2) in the USA.. The sign for break down dummies are all negative and the coefficients are all significant.

Due to the each problem associated with each country in the year defined, there was a 41.26% reductions (because of 1986 economic recession), in the number of tourist visiting North Cyprus from Turkey. The reductions for each countries are; from Germany 49.19%, from USA 31.4%, from Australia 78.8 % and from Turkey as the luggage traders case 24.35% as a consequence of 1991 Gulf crisis (DM1). These are the reductions caused by the problems, identified by dummy variables, in each country in certain years, and these reductions is according to the one year before the event occurred. There is also 28.83% reduction in Turkish visitors, %31 in German and 62.28% in American to North Cyprus indicated by (DM2) which is the consequence of Gulf crisis. This method of calculation is described in the previous case related to Malta.

Trend variable is another issue tested in our regression equations to see whether the number of visitors received by Malta and North Cyprus is a product of long-term trend or is just an occasional. In other words, this will show us whether Malta and North Cyprus are increasing in popularity. When the sign of the coefficient of trend is positive, then we can talk about fashionability and vice verse.

The exact interpretation of the trend variable is as follows, using Germany to Malta (coefficient +0.018) and periods 60 and 61 (1990.4 and 1991.1 as the example:

$$\ln V_t/P_t = \ldots +0.018 * 61 \ +\ldots$$

$$\ln V_{t-1}/P_{t-1} = \ldots +0.018 * 60 \ +\ldots$$

Therefore for any two sequential periods

$$\ln (V_t/P_t) - \ln (V_{t-1}/P_{t-1}) = 0.018$$

or

$$\ln [(V_t/P_t) / (V_{t-1}/P_{t-1})] = 0.018$$

Taking antilog

$$(V_t/P_t) / (V_{t-1}/P_{t-1}) = 1.018$$

This indicates that demand from Germany to Malta is increasing at 1.8 percent {(1-1.018)*100} per quarter in general. In another way, 1991.1 (first quarter) demand would be 1.018 percent of demand in 1990.4 (fourth quarter); thus an increase of 1.8 percent is indicated. There is also, 1%, 1.9%, and 0.4% increase per quarter in demand to Malta from Italy, Libya and the UK correspondingly. However, there is 2.3% and 0.7% decrease in tourism demand to Malta from Austria and USA.

Our results for N. Cyprus show similarly that there is a 1.5% increase per quarter in tourist received from Germany, and 3.1% increase per quarter tourist visiting the country from Turkey as luggage traders. Although the coefficient values of trend variable is not that high, they are statistically significant.

Trend represents the popularity of the country in which positive trend coefficients refers fashionable and negative refers not fashionable. The lag dependent variable is expected to have positive sign. The estimated coefficients of the lagged dependent variables in Table 7.2, 0.251, (-), 0.472, 0.412, 0.404, 0.182, 0.458, all are between 0 and 1 as stipulated by distributed lag theory. The magnitude of lags coefficient indicates that large part of the number of people choosing a particular holiday in a given year can be predicted on the basis of the number who chose it in the previous year, thus only leaving a small part of this number to be accounted for by the remaining explanatory variables. A problem therefore with the presence of the lagged dependent variable is that it dominates the equation and hence it tends to "swallow up" various other effects. A 1 percent increase in the number of tourist arrivals to Malta in one year results in a 0.25%, (-), 0.47%, 0.41%, 0.40% 0.18% and 0.46% increase in the number of tourist arrivals in the next year from Austria, Denmark, Germany, Italy, Libya, the UK and USA respectively. This is explained as a cause of revisit (risk aversion and *habit persistence*) and a cause of supply constrained demand. Because of the multicollinearity problem, the size and significance of the variable coefficients in the models may be distorted. For example, as it is explained in chapter 5, the exchange rates variable may sometimes represents costs of living in destination country, therefore, this may mean that if the exchange rates variable does not appear in the model and cost of living remains, the coefficient of the cost of living variable may be biased upwards when cost of living and exchange rates are highly negatively correlated. It is also valid for air fares and surface cost variables since both variables represents price elasticity and relevant to each other, therefore, they also highly negatively correlated. We have obtained high adjusted R^2 values, it implies that the models fit the data well and there can be considerable confidence in the empirical results. For Austria, Denmark, Germany, Italy, the UK and USA, we have 0.88, 0.84, 0.96, 0.96, 0.86, and 0.87 adjusted R^2 values respectively. By contrast, where the R^2 values are not particularly high, caution should be exercised in drawing conclusions. Similarly, statistically significant coefficients allow for greater confidence. Only Libya has low R^2 values with 0.61 which needs a particular caution in our study. Most of the equations we practised in the whole study satisfies the diagnostic tests and wherever necessary we made relevant corrections.

The results for N. Cyprus are somewhat different, suggest less habit persistence. However, we have to keep in mind that some of the people visiting North Cyprus, as indicated earlier, are not necessarily motivated with tourism but to visit their home country. As can be seen from the table 7.4, our best regression produced trend values only for Germany and Turkish second equation, namely luggage traders. The coefficients are 0.015 and 0.031 respectively. This implies that the contribution of German and Turkish citizens in the 1% increase in the number of visitors arrived at North Cyprus are 0.15% and 0.31% respectively.

It is time to offer interpretation on the overall significance of our regression equations. We have, in total, six regression equations for North Cyprus, and except for Australia the overall significance is rather high as the coefficient of determinations (R^2s) which show the power of our variables in each equation in explaining the total variation is high. This is a valid statement for R^{-2}s as well, which are adjusted coefficient of determination. The R^2 results are as follow; for Turkey is 75.1%, the UK 90%, Germany 90.8%, the USA 70%, Australia 46% and Turkey 88.4%. This means, for example, that our equation for the Turkish luggage traders can explain 88.4% of the total variation in the number of Turkish visitor arriving at North Cyprus. Our equation for Australia shows that our variables fail to capture a great percentage of the variation associated with the number of visitors from Australia as the magnitude of the coefficient of determination is only 46% which means that our equation can only explain the 46% of the variation associated with the visitors from Australia. Therefore, we can suggest that for the Australian visitors we should provide some other variables which are crucial in their decision to take a visit to North Cyprus. However, in overall we can easily state that our equations have been successful in capturing the dynamics of the variation in tourism activity oriented towards North Cyprus.

It is possible to find the long-run relationships between dependent and independent variables in section 7.2 (cointegration) of the same chapter.

7.2 Cointegration

Until now not many quarterly estimation has been done in this field, especially for cointegration analysis. Very recently, Kulendran (1996) and, Kulendran and King (1997) have contributed to the literature with tourism demand model which is also built on Witt and Martin (1987) econometric model. Therefore, we would like emphasise that it is new to use cointegration in tourism. No one applied cointegration of tourism demand to particular countries (i.e., N. Cyprus, Malta, The Isle of Man etc.). It is important to note that our study is the only study which is based on small island states and consists quarterly basis data. This is therefore believed to bring better economic understanding when researchers are interested in seeing long-run economic relationship. It is also a unique study which gives comparative idea between large countries and small countries.

7.2.1 ADF test for unit roots and Interpretations

The first step in cointegration analysis is to identify the order of integration of individual series . This is achieved by using Augmented Dickey Fuller tests (ADF) and the results are shown in Table 7.5.

It is possible to have identical critical values with marginal differences at the same percentage level for different series. However, it will not affect the result of ADF-test. All variables are expressed in logarithms. The relevant critical values are given by Mackinnon (1991). The corresponding critical values, with intercept and trend at 4 lag values for 80 observations at 5 % significance level, are obtained as -3.47. The calculated t-statistics reject a unit root in favour of stationarity when it is above the 5 % critical value (-3.47) which means that stationarity is achieved for the related series. In most of the cases, an augmentation of one appeared to be sufficient to secure lack of autocorrelation of the error terms. In some cases, however, no augmentation was necessary. Eviews version 2.0 is used for all econometric computations in this study.

Almost all the results suggest the first difference of the series is stationary, indicating that these variables are I(1). However, some variables appear to be I(2), that is second difference stationary. You may find the abbreviations of each series in the appendix of the thesis.

Table 7.5 ADF Test Statistics

Variables	At Level	1st Differences	2nd Differences
A1		-5.579	
A2		-4.253	
A3		-4.255	
A4		-4.325	
A5		-0.713	
A6		-5.626	
A7		-4.818	
M1		-4.982	
M2		-3.537	
M3		-4.099	
M4		-5.178	
M5		-4.931	
M6		-3.654	
M7		-3.935	
N1			-4.804
N2			-5.001
N3			-4.387
N4			-5.190
N5		-3.560	-4.628
N6		-3.625	
T1		-3.711	
T2		-3.646	
T3		-4.121	
T4		-3.628	
T5	-4.387	-4.090	
T6			
T7			-4.364
T8			-4.378
T9		-4.897	
T10		-4.174	
T11		-3.642	
T12		-3.565	
T13		-4.394	
U1		-4.137	
U2		-5.341	
U3		-5.104	
U4		-6.238	

U5		-5.189	
U6		-4.690	
U7		-4.369	
U8			-7.630
I1			-5.757
I2		-4.187	
IN1			-6.000
IN2		-4.193	
IN3			-5.495
IN4			-5.444
IN5		-4.612	
IN6		-3.629	
IN7		-3.663	
IN8		-3.839	
IN9		-3.884	
IN10		-3.487	
IN11		-3.551	
IN12		-4.689	
IN13		-3.759	
IN14			-5.310
IN15			-5.567
IN16	-3.718		
IN17			-5.175
IN18			-5.151
IN19		-3.846	
IN20			-5.223
IN21		-3.807	
IN22		-3.633	
IN23	-3.987		
CL1			-5.340
CL2			-4.992
CL3		-4.068	
CL4			-7.275
CL5		-3.557	
CL6			-4.693
CL7		-3.774	
CL8			-4.509
CL9			-4.933
CL10			-4.641
CL11			-4.915
CL12			-5.625
CL13		-4.181	
CL14			-5.069
CL15		-3.721	
CL16		-3.926	
CL17		-3.920	
CL18		-3.914	
CL19		-3.831	
CL20		-3.721	
CL21		-3.594	
CL22		-3.600	
CL23			-4.967
CL24		-4.149	
CL25		-3.659	
CL26		-3.837	
CL27	-3.823		
CL28			-4.213
CL29			-5.221

CL30	-3.797	
CL31		-5.284
CL32		-5.114
CL33	-3.718	
CL34	-4.506	
CL35		-4.905
CL36		-4.843
CL37		-4.925
CL38	-3.888	
CL39	-3.698	
CL40		-5.914
CL41	-4.138	
CL42	-4.170	
CL43	-3.766	
EX1		-5.612
EX2		-5.612
EX3	-3.522	
EX4		-4.884
EX5	-5.729	
EX6		-4.836
EX7	-4.491	
EX8		-4.992
EX9		-5.179
EX10		-5.043
EX11		-5.387
EX12		-5.253
EX13	-4.987	
EX14	-3.624	
EX15	-3.692	
EX16		-5.790
EX17	-4.471	
EX18	-3.692	
EX19		-5.436
EX20	-4.117	
EX21	-4.471	
EX22	-4.491	
EX23	-4.281	
EX24		-5.790
EX25	-4.685	
EX26	-3.692	
EX27		-5.517
EX28	-4.326	
EX29	-5.038	
EX30	-3.989	
EX31	-4.120	
EX32	-4.482	
EX33	-4.117	
EX34	-3.558	
EX35	-3.552	
EX36	-3.479	
EX37	-3.963	
EX38	-3.862	
EX39		-5.790
EX40	-4.474	
FF1	-3.608	
FF2		-5.127
FF3	-4.793	
FF4	-4.607	
FF5	-4.008	

FF6		-3.817	
FF7			-6.171
FF8		-4.370	
FF9		-3.805	
FF10		-4.712	
FF11		-3.860	
FF13		-4.605	
FF14		-4.006	
FF20		-4.006	
FF21		-4.546	
FF22		-4.613	
FF23		-4.674	
FF24		-4.672	
FF25		-4.311	
FF26		-4.225	
FF27		-3.584	
FF28		-3.696	
FF29		-3.938	
FF30		-4.726	
FF31	-3.563		
FF32		-4.533	
FF33		-4.780	
FF34		-4.697	
FF35		-3.594	
FF36		-3.602	
FF37			-5.758
FF38		-4.054	
FF39		-3.544	
FF40			-5.822
FF41		-4.711	
FF42		-4.194	
FF43		-4.000	
S1		-3.676	
S2		-3.699	
S3		-3.994	
S4			-6.201
S5		-5.029	
S6			-5.335
S7		-3.676	
S8		-3.606	
S9		-3.537	
S10		-3.994	
S11		-5.029	
S12		-4.122	
S13		-3.608	
S14		-3.608	
S15		-3.608	
S16			-5.335
S17			-5.335
S18		-3.626	
S19		-3.626	
S20		-4.122	
S21		-4.122	
S22		-3.537	
S23		-3.676	
S24		-3.684	
S25			-6.959
S26			-6.222
S27			-6.229

S28		-6.611
S29		-6.747
Z1	-5.345	
Z2	-3.812	
Z3	-4.344	
Z4	-4.776	
Z5	-7.218	
Z6	-6.199	
Z7	-4.575	
W1	-4.990	
W2	-3.715	
W3	-3.952	
W4	-5.194	
W5	-4.976	
W6	-4.192	
W7	-4.124	
P1		-4.449
P2	-3.924	
P3	-4.515	
P4		-5.082
P5	-3.901	
P6	-4.230	
X1	-4.480	
X2	-4.771	
X3	-4.526	
X4	-3.680	
X5	-5.148	
X6	-4.478	
X7		-5.495
X8	-4.124	
X9	-5.341	
X10	-4.711	
X11	-4.053	
X12	-4.593	
X13	-4.849	
G1	-4.574	
G2	-5.353	
G3	-5.085	
G4	-6.214	
G5	-4.938	
G6	-5.499	
G7	-4.355	
G8	-5.380	
J1		-4.918
J2	-5.562	

1 % Critical value	-4.0853
5 % Critical value	-3.4704
10 % Critical value	-3.1620

7.2.2 Interpretation of Cointegration Results

The unit root tests suggest that it may be possible to identify long run tourism demand equations which cointegrate. The equations presented show some of the results for Malta and North Cyprus.

Table 7.6 Johansen Maximum Likelihood (ML) procedure: cointegration likelihood ratio (LR) test to determine the number of cointegrating vectors (r), based on maximal eigenvalues of the stochastic matrix. Malta Inbound.

Cointegrating equation	Null Hypo.	Alternative Hypo.	Eigenvalue	LR - test statistic	Critical Values 5%	1%	
10. GERMANY to MALTA							
	r=0	r=1	0.448	75.590	68.52	76.07	None*
	r≤1	r=2	0.212	30.940	47.21	54.46	At most 1
	r≤2	r=3	0.102	13.035	29.68	35.65	At most 2
	r≤3	r=4	0.050	4.917	15.41	20.04	At most 3
	r≤4	r=5	0.013	0.994	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5% (1%) significance level.
LR test indicates 1 cointegrating equation(s) at 5% significance level.

Cointegrating equation	Null Hypo.	Alternative Hypo.	Eigenvalue	LR - test statistic	Critical Values 5%	1%	
13. UK to MALTA							
	r=0	r=1	0.374	81.443	68.52	76.07	None**
	r≤1	r=2	0.237	46.196	47.21	54.46	At most 1
	r≤2	r=3	0.151	25.821	29.68	35.65	At most 2
	r≤3	r=4	0.092	13.504	15.41	20.04	At most 3
	r≤4	r=5	0.080	6.261	3.76	6.65	At most 4*

*(**) denotes rejection of the hypothesis at 5% (1%) significance level.
LR test indicates 1 cointegrating equation(s) at 5% significance level.
In a multivariate context, maximum number of cointegrating vectors can be $r=N-1$ where N represents the number of variables in cointegrating regression. For the critical values reported by EVIEWS 2.0 version, see Osterwald-Lenum (1992). Both the λ max and Trace statistics have been used for testing the number of co-integrating vectors.

7.2.2.1 Interpretation of cointegration results for Malta

They are equations representing Germany and UK quarterly visits to Malta. Since we are interested in small island states, Germany-Malta and the UK-Malta tourism demands were used to estimate the long-run equilibrium relationships between tourist arrivals and factors that influence these arrivals such as income, price, exchange rates and air fare. We tested for the possibility of multiple long-run relationships using Johansen (1991) test and one relationship was found at 5% significance level in both cases. Table 7.6 provides log-likelihood ratio statistics for determining the number *(r)* of long-run relationships between quarterly tourist arrivals, income, cost of living, exchange rates and air fare. The number of the long-run relationships is determined sequentially starting with the null hypothesis $r=0$ which is no long-run relationship between quarterly tourist arrivals, income, cost of living, exchange rates and air fares. To reject the null of $r=0$ (no long-run relationship) in favour of the alternative that $r=1$, the calculated value of the statistics should be greater than the 5% critical value. The results tabulated above indicates that the null of $r=0$ (no long-run relationship between tourist arrivals, income, cost of living, exchange rates and air fare) can be rejected in favour of the alternative $r=1$ for Germany. Germany, have one statistically significant long-run relationship between tourist arrivals, income, cost of living, exchange rates and air fare. In the UK case the null of $r\leq 4$ can be rejected in favour of the alternative $r=5$; that means there is precisely one statistically significant long-run relationship between tourist arrivals, income, cost of living, exchange rates and air fare. Whereas, the null of $r=0$, $r\leq 1$, $r\leq 2$, $r\leq 3$, cannot be rejected to the alternative $r=1$, $r=2$, $r=3$, $r=4$ correspondingly (at 5% critical value). The rank of the two matrices Π are one.

The first row of the β' matrix (cointegrating vector) is:

		IN	CL	EX	FF	C
(Germany)	1.000	-9.744	1.485	-6.131	-3.517	49.289
		(0.519)	(0.673)	(0.564)	(2.122)	
(The UK)	1.000	-1.917	-0.070	0.259	0.438	8.637
		(0.366)	(0.337)	(0.025)	(0.965)	

$$W3 = -49.289+9.744(IN4)-1.485(CL10)+6.131(EX10)+3.517(FF10)$$

$$Z1 = -8.637+1.917(IN2)+0.070(CL1)-0.259(EX1)-0.438(FF1)$$

which has been standardised so that its first element corresponds to the dependent variable (*seasonally adjusted number of tourist arrivals per capita in log form, W3, Z1*) in the first equation (see normalised equations in Annex for detail).

The estimated parameters for Germany has correct signs, for income, cost of living and exchange rates and opposite sign for air fares. On the other hand, the UK has expected signs except cost of living and exchange rates. For Germany, all coefficients exceeds unity which means demand elasticities are elastic. The lower income elasticity for the UK may be a reflection of lower travel costs, whereas more distant destinations generally have high income elasticities (see Kulendran 1996). The estimated income coefficients suggest that a 1% increase in real income results in a 9.74% and 1.92% increase in tourist arrivals to Malta from Germany and the UK respectively. Since we used cost of living as a proxy for consumer price index, the cost of living coefficients gives us the price elasticities. A 1% increase in the Maltese price level causes 1.485% decrease and 0.07% increase in tourist arrivals to Malta from Germany and the UK correspondingly. Having low price elasticity (below unity) in the UK equation reminds us that there is an unanticipated inflation effect. On the other hand, German tourists are insensitive for the price changes in destination country. The exchange rates coefficients have positive sign in Germany and negative in the UK equations. The estimated sign was positive but in the UK case the situation is completely different. British people may change their travelling attitudes if their welfare level increases. In terms of exchange rates, for example, we obtained negative coefficients which means British tourist may prefer to travel long distance destination which is more costly and they may become more insensitive about Mediterranean destinations. Therefore a 1% increase in exchange rates results 0.26% decrease in the number of British arrivals to Malta, however, 6.13% increase in the number of German visits to the same destination. The reverse situation is valid for German tourist for transport costs. The German tourists are insensitive to the changes in the air fares but British do not. This is due to the fact that there are many connections to Malta from the UK since Malta was a British Colony, there are cultural ties between two countries. British people are travelling with chartered flights and many other private airlines are competing on prices since the UK has the greatest share in Maltese tourism sector. Therefore a 1% increase in air fares, results 3.52% increase in the German visits and 0.44% decrease in British visits to Malta. The diagnostic tests are applied for all equations and all matches the necessary limits.

As we mentioned before our equation is LN w6 = f (in21, cl13, ex13, ff13). Briefly, we listed our group series from, the number of seasonally adjusted quarterly visits, income per capita, cost of living, exchange rates, and air fares variables in logarithm forms. The same variables are included in different group series and Johansen cointegration tests are applied for another 42 origin countries. The results in detail format are obtained from EVIEWS and included in the ANNEX. However, we decided to select randomly the UK and Germany to examine here and explain the findings in detail.

Table 7.7 Johansen Maximum Likelihood (ML) procedure: cointegration likelihood ratio (LR) test to determine the number of cointegrating vectors (r), based on maximal eigenvalues of the stochastic matrix. North Cyprus Inbound.

Cointegrating equation	Null Hypo.	Alternative Hypo.	Eigenvalue	LR - test statistic	Critical Values 5%	1%	
16. UK to NORTH CYPRUS							
	r=0	r=1	0.364	43.411	47.21	54.46	None
	r≤1	r=2	0.214	22.136	29.68	35.65	At most 1
	r≤2	r=3	0.132	10.801	15.41	20.04	At most 2
	r≤3	r=4	0.084	4.17	3.76	6.65	At most 3*

*(**) denotes rejection of the hypothesis at 5% (1%) significance level.
LR test indicates 1 cointegrating equation(s) at 5% significance level.

Cointegrating equation	Null Hypo.	Alternative Hypo.	Eigenvalue	LR - test statistic	Critical Values 5%	1%	
13. GERMANY to NORTH CYPRUS							
	r=0	r=1	0.459	53.370	47.21	54.46	None*
	r≤1	r=2	0.230	24.486	29.68	35.65	At most 1
	r≤2	r=3	0.166	12.189	15.41	20.04	At most 2
	r≤3	r=4	0.074	3.650	3.76	6.65	At most 3

*(**) denotes rejection of the hypothesis at 5% (1%) significance level.
LR test indicates 1 cointegrating equation(s) at 5% significance level.
In a multivariate context, maximum number of cointegrating vectors can be $r=N-1$ where N represents the number of variables in cointegrating regression. For the critical values reported by EVIEWS 2.0 version, see Osterwald-Lenum (1992). Both the λ max and Trace statistics have been used for testing the number of co-integrating vectors.

7.2.2.2 Interpretation of cointegration results for North Cyprus

The equations given in Table 7.7 are representing the UK and Germany quarterly visits to North Cyprus. The main idea of analysing cointegration equations for tourism demand is to estimate long-run equilibrium relationship between tourist arrivals and factors that influence these arrivals i.e., income, cost of living and exchange rates. Due to lack of data availablity, we did not include air fares in our cointegration equation. Johansen's (1991) test were used to test the possible multiple long-run relationship both in 5% and 1% significance level. Log-likelihood ratio statistics determines one cointegrating equations at 5% level from the UK to N. Cyprus and from Germany to N. Cyprus. The number of the long-run relationship is determined in most usual way starting with the null hypothesis, r=0, which states that there is no long-run relationship between quarterly visit, income, cost of living etc. To reject the null hypothesis of r=0 (no long-run relationship) in favour of alternative that is r=1, the calculated Likelihood Ratio (LR) statistics should be greater than 5% critical value. Therefore our results indicated in Table 7.7 proves that the null hypothesis, r=0, is rejected in favour of alternative r=4 for the UK, and in favour of r=1 for Germany. As a result. the rank of two matrices as explained above give us the following simplified equation;

The first row of the β' matrix (cointegrating vector) is:

		IN	CL	EX	C
(The UK)	1.000	-2.176	-1.063	0.150	14.232
		(0.340)	(0.209)	(0.041)	
(Germany)	1.000	-0.753	-2.679	-0.342	8.517
		(0.414)	(0.519)	(0.127)	

P2 = -14.232+2.176(IN21)+1.064(CL16)-0.150(EX16)

P3 = -8.517+0.753(IN4)+2.679(CL17)+0.342(EX17)

The estimated parameters for the UK has correct signs for income per capita (IN) and unexpected wrong signs for the cost of living (CL) and exchange rates (EX). However, for Germany we obtained correct coefficient signs for income and exchange rates, but not for the cost of living. The higher income elasticity for the UK may be a reflection of lower travel costs or an influence of strong family relationships between Turkish Cypriots living in the UK and living in North Cyprus. The estimated income coefficient suggest that a 1% increase in real per capita income results in a 2.17% and 0.75% increase in the number of tourist arrivals to North Cyprus from the UK and Germany respectively. Cost of living variable gives us the price elasticities as a proxy for consumer price index (CPI) as we explained in section 7.2.2.1. A 1% increase in N.Cyprus price level brings about 1.06% and 2.67% increase in tourist arrivals to North Cyprus from the UK and Germany correspondingly. Having high price elasticity in both equations is a result of having high rate of inflation in North Cyprus. Therefore, the purchasing power parity works for the interest of foreign visitors. Exchanging rates due to inflationary effects gives power to the British and German visitors to buy more tourist services on the Island which plays an important role in the early stages of holiday bookings. The exchange rates coefficients have positive sign for Germany and negative sign for the UK equations. Similar results are obtained from the same countries for Malta Inbound. As we explained above, British tourists may prefer to travel far destinations if their welfare level becomes better due to exchange rate differences. Then they may become more insensitive about Mediterranean destinations because they think travelling there is always cheaper and easier than going long-haul destinations. For British tourists, therefore, exchange rates does not play a determining role in short-haul travel. A 1% increase in exchange rates is a result of 0.15% decrease in the number of tourist arrivals from the UK to North Cyprus. The reverse is valid for Germans, because they are sensitive the exchange rate effects. Germans expect to have positive effect of having stable Deutch Mark against unstable Turkish Lira. As we explained before, sometimes cost of living is expressed with exchange rate terms. Germans are sensitive to the cost of living in N. Cyprus, therefore, strong and stable Deutch Mark against Turkish Lira is very influential on German travellers in their decision to travel to North Cyprus. A 1% increase in exchange rates is a result of 0.34% increase in the number of German arrivals to North Cyprus. Besides that, both equations satisfies all necessary diagnostic tests.

Econometric theory simply emphasise that a group of *non-stationary* time series is *cointegrated* if there is a linear combination of them that is *stationary*; that is, the combination does not have a stochastic trend. The linear combination is called the *cointegrating equation.* Its normal interpretation is a long-run equilibrium relationship. If you have N endogenous variables, each of which is first-order integrated (I(1) series; that is, each has a unit root or stochastic trend or random-walk element), there can be from zero to *N-1* linearly independent cointegrating vectors.

The series that we used for Johansen cointegration tests were nonstationary series. For normal tests we used four lag variables and we found at least one cointegrated equation at 5% significance level. In some equations: Austria to Malta, Australia to North Cyprus, Netherlands to Turkey, France to the UK, and Finland to the UK no cointegration was found at four lags level. We tried again at different lag levels and cointegration was found at smaller lag values. If Augmented Dickey-Fuller(ADF) tests show that some of the series are integrated, but the Johansen tests show that the cointegrating rank is *N*, there may be a contradiction. Some specification error might be responsible for this contradiction. Therefore, econometric theory guides us to use Ramsey Reset stability tests to check if there is any omitted variables in the equation or whether there is any autocorrelation. The necessary tests were applied and specification error was corrected.

7.3 Forecasting Results

To determine the usefulness of the equations presented above for forecasting, comparisons are made of forecasts made over particular time horizons. We have seen there are a number of alternative criteria for measuring forecast accuracy - RMSE, MSE, MAE, MSPE, TIC, etc. which can give different rankings so that there is no guarantee that a method that performs well under one criterion is satisfactory under the others. The result is that any conclusion from a given data set should be regarded only as indicators of forecasting ability and not as proof of the correctness or otherwise of the underlying model.

Most studies which examine forecasting accuracy concentrated upon on MSE/RMSE as measures of accuracy. Fritz *et al.* (1984) examine the effects of combining forecasts produced using time-series and econometric forecasts of air arrivals into the State of Florida and present MSE for each approach for four different forecast horizons in their paper. Similarly Fujii and Mak (1980) use RMSE to evaluate the forecast in their study which are related with three different methods of estimating an econometric model to forecast the number of US visitors travelling to Hawaii. Table 7.8, 7.9, and 7.10 therefore present these summary statistics (other measures are shown in volume 2.).

Table 7.8 RMSE 5 years ahead forecast rank 1991.1-1995.4

Origin countries	DES	HW	ARMA	ECONOMETRIC
1. Denmark to Austria	3	1	2	2
2. France to Austria	4	1	2	3
3. UK to Austria	4	1	2	3
4. Canada to Austria	4	1	2	3
5. Netherlands to Austria	4	2	1	3
6. USA to Austria	4	1	2	3
7. Turkey to Austria	2	1	3	4
8. Austria to Malta	4	1	2	3
9. Denmark to Malta	4	1	2	3
10. Germany to Malta	4	1	2	3
11. Italy to Malta	4	1	2	3
12. Libya to Malta	4	1	3	2
13. UK to Malta	4	1	3	2
14. USA to Malta	4	1	2	3
15. Turkey to N.Cyprus(83)	4	2	1	3
16. UK to N. Cyprus	4	1	3	2
17. Germany to N. Cyprus	4	1	2	3
18. USA to N. Cyprus	4	1	2	3
19. Australia to N. Cyprus	4	1	2	3
20. Turkey to N. Cyprus	4	1	2	3
21. Germany to Turkey	4	1	2	3
22. Austria to Turkey	4	1	3	2
23. France to Turkey	4	1	3	2
24. UK to Turkey	4	1	3	2
25. Italy to Turkey	4	2	1	2
26. USA to Turkey	4	1	2	3
27. N. Cyp to Turk(86-95)	4	1	2	3
28. Israel to Turkey	4	3	1	2
29. Denmark to Turkey	4	1	3	2
30. Switzerland to Turkey	4	1	2	3
31. Greece to Turkey	4	1	3	2
32. Belgium to Turkey	4	1	2	3
33. Netherlands to Turkey	4	1	2	3
34. USA to UK	4	1	2	3
35. Germany to UK	4	1	2	3
36. Austria to UK	4	1	2	3
37. France to UK	4	1	2	3
38. Japan to UK	2	1	4	3
39. Finland to UK	4	1	2	3
40. Spain to UK	4	1	2	3
41. IOM to UK	4	1	2	3
42. UK to IOM	4	1	2	3
43. EIRE to IOM	4	1	2	3

Table 7.9 RMSE 2 years ahead forecast rank1994.1-1995.4

Origin countries	DES	HW	ARMA	ECONOMETRIC
1. Denmark to Austria	4	1	3	2
2. France to Austria	4	1	2	3
3. UK to Austria	4	1	2	3
4. Canada to Austria	4	1	2	3
5. Netherlands to Austria	4	1	2	3
6. USA to Austria	4	1	2	3
7. Turkey to Austria	3	1	2	4
8. Austria to Malta	4	1	3	2
9. Denmark to Malta	4	1	2	3
10. Germany to Malta	4	1	2	3
11. Italy to Malta	4	1	2	3
12. Libya to Malta	4	1	2	3
13. UK to Malta	4	1	3	2
14. USA to Malta	4	1	3	2
15. Turkey to N.Cyprus(83)	4	1	2	3
16. UK to N. Cyprus	4	1	3	2
17. Germany to N. Cyprus	4	1	2	3
18. USA to N. Cyprus	4	1	2	3
19. Australia to N. Cyprus	2	1	3	4
20. Turkey to N. Cyprus	4	1	2	3
21. Germany to Turkey	4	1	2	3
22. Austria to Turkey	4	1	3	2
23. France to Turkey	4	1	2	3
24. UK to Turkey	4	1	3	2
25. Italy to Turkey	4	1	2	3
26. USA to Turkey	4	1	3	2
27. N. Cyp to Tur(86-95)	4	1	2	3
28. Israel to Turkey	4	1	2	3
29. Denmark to Turkey	4	1	3	2
30. Switzerland to Turkey	4	3	1	2
31. Greece to Turkey	4	1	3	2
32. Belgium to Turkey	4	1	2	3
33. Netherlands to Turkey	4	1	2	3
34. USA to UK	4	1	2	3
35. Germany to UK	4	1	2	3
36. Austria to UK	4	1	2	3
37. France to UK	4	1	2	3
38. Japan to UK	4	1	3	2
39. Finland to UK	4	1	2	3
40. Spain to UK	4	1	2	3
41. IOM to UK	4	1	2	3
42. UK to IOM	4	1	2	3
43. EIRE to IOM	4	1	2	3

Table 7.10 RMSE 1 year ahead forecast rank 1995.1-1995.4

Origin countries	DES	HW	ARMA	ECONOMETRIC
1. Denmark to Austria	3	4	2	1
2. France to Austria	4	1	2	3
3. UK to Austria	4	1	2	3
4. Canada to Austria	3	4	2	1
5. Netherlands to Austria	4	1	3	2
6. USA to Austria	2	4	1	3
7. Turkey to Austria	4	1	2	3
8. Austria to Malta	3	4	2	1
9. Denmark to Malta	3	4	1	2
10. Germany to Malta	3	4	1	2
11. Italy to Malta	3	4	2	1
12. Libya to Malta	3	4	2	1
13. UK to Malta	4	1	3	2
14. USA to Malta	4	1	3	2
15. Turkey to N.Cyprus(83)	4	1	3	2
16. UK to N. Cyprus	3	4	1	2
17. Germany to N. Cyprus	4	1	3	2
18. USA to N. Cyprus	4	1	2	3
19. Australia to N. Cyprus	1	4	2	3
20. Turkey to N. Cyprus	3	4	1	2
21. Germany to Turkey	3	4	1	2
22. Austria to Turkey	3	4	2	1
23. France to Turkey	4	1	3	2
24. UK to Turkey	3	4	2	1
25. Italy to Turkey	3	4	1	2
26. USA to Turkey	3	4	2	1
27. N. Cyp to Tur(86-95)	4	1	2	3
28. Israel to Turkey	3	4	1	2
29. Denmark to Turkey	3	4	2	1
30. Switzerland to Turkey	4	1	2	3
31. Greece to Turkey	3	4	1	2
32. Belgium to Turkey	3	4	1	2
33. Netherlands to Turkey	3	4	1	2
34. USA to UK	3	4	1	2
35. Germany to UK	4	1	2	3
36. Austria to UK	4	1	2	3
37. France to UK	4	1	2	3
38. Japan to UK	4	1	3	2
39. Finland to UK	4	1	3	2
40. Spain to UK	4	1	2	3
41. IOM to UK	4	1	2	3
42. UK to IOM	3	4	2	1
43. EIRE to IOM	3	4	2	1

7.3.1 Interpretation of Forecasting Results

There are 43 different combinations of visits from origin countries to destination countries in our forecasting study (full details in volume 2) and we summarised the results illustrated above under three forecasting horizons (5, 2 and 1 year periods). You will find a brief explanations based on the simple ratio calculations on total 43 forecasting frequencies. The results for the various forecasting horizons (5, 2 and 1) show that HW[1] has the highest forecasting accuracy based upon the RMSE[2] criteria HW came first 83.37% of the time (38 out of 43), 97.67% of the time (42 out of 43) and 44.18% of the time (19 out of 43) over the 5, 2 and 1 year forecast periods respectively. However, when short-term (1 year ahead) forecast takes place, HW does not perform so well. Over this short period the econometric models seem to perform quite well (25% of the time), as do the ARMA[3] models (27.90% of the time). Yet, it overall, however, autoregressive forecasting became the second most accurate method with 65.11% of the time (28 out of 43), 67.44% of the time (29 out of 43) and 53.48% of the time (23 out of 43) over the 5, 2, and 1 year forecast periods respectively. For five and two years forecast period, Econometric[4] forecasting became the third best method with 74.41 (32 out of 43) and 67.41 (29 out of 43) percent and DES[5] for 1 year forecast period with 44.18 (19 out of 43) percent. In general DES has been found the least accurate method for five and two years forecast horizon.

The basic idea of the HW method is, to forecast with an explicit linear trend model with "seasonal effects". The method computes recursive estimates of the intercept or permanent component, the trend coefficient, and the seasonal effects. Since our series has seasonal effects, and the magnitudes of the effects do not grow along with the series, then we should use the HW method with additive seasonals. In this case, there were three damping parameters, which we may specified or estimated, in any

[1] HW stand for Holt - Winters Additive Smoothing forecasting method.
[2] RMSE stands for Root Mean Square Error.
[3] Autoregressive forecasting sometimes referred as ARMA or Box and Jenkins Forecasting.
[4] Econometric Forecasting may sometimes referred as 'historical forecasting' or 'actual static' forecasting.
[5] DES stands for Double Exponential Smoothing Forecasts.

combination. On the other hand, HW became the best method while it keeps the seasonality and trend effects eventually. Another interesting findings have been obtained from this study that HW is either the most accurate method with 44.18 (19 out of 43) percent or least accurate one with 55.18 (24 out of 43) percent for only short term (1 year) forecast horizon. Otherwise, it is the most accurate method without any dispute. The size of forecast horizon, the data sample, the origin country and the destination country are all matters when different predictions take place, and therefore, alternative results may be achieved. We shouldn't forget that forecasting depends on assumptions and is not one hundred percent true.

There is an absolute reality we shouldn't neglect that the results may vary from one country to another and the forecasting accuracy is biased if you consider only two alternatives. Yet, with EVIEWS we may sometimes face unavoidable shortcomings. However, Witt and Witt (1992) study demonstrates us almost the similar results when seven different forecasting methods are included in their studies. The package Witt and Witt (1992) used named ORION[6], is highly expensive and not a basic package. It is a commercial program which gives more comprehensive and better output than EVIEWS. The Additional univariate forecasting methods (Decomposition, Gompertz, and Trend Curve analysis) indicated in Witt and Witt's (1992) study did not perform better results therefore the methods we used are the most preferable methods that many practitioner found ideal for the study. The most recent study in the same field was made by Kulendran and King (1997) to forecast quarterly tourist flows using error correction and time series models.

Overall our regression equations do not seem to perform very well in these forecasting tests. Perhaps this is due to the way in which seasonality and trend incorporated in the models. Alternatively, it may be because of the time horizons chosen, or because time series methods work best (Witt and Witt, 1992). Changes in seasonality sometimes do not led the econometric forecasts to perform better results. There might be the data problems. More clearly, there may be a difference between the theoretical concepts we are trying to measure and the data. Also,

[6] ORION is Comshare's forecasting package. Comshare is a commercial organisation which gave an access to Witt and Witt (1992, pp.8-9) for their study.

published data may to some extend be inaccurate because of incomplete coverage, the "hidden" economy, the use of sample estimates rather census values, and data-processing errors.

We can come to a conclusion that one-year ahead forecasts are more accurate than two-year ahead and five-year ahead forecasts, thus supporting Makridakis's (1986, p.34) assertion that "Inertia in business and economic trends makes short-term forecasting simpler.....As the time horizon of forecasting increases so do the chances of systematic changes that can affect the future".

More accurate forecasts may be expected with large flows because these flows can only occur for well-established destinations. Large fluctuations in travel to such destinations would not be expected, except if, say civil war broke out. This is partly due to supply constraints - it takes time to build hotels, to construct new airports, provide enough infrastructure, and organisational inertia- tour operators have established links with hotels which have developed over time. IN some cases vertical integration has taken place with tour operators owning their own hotels. It will be in tour operators' interests therefore to keep selling holidays to those established resorts, and to a certain extent tourists can only go to those destinations where tour operators offer holidays. Furthermore, once a destination is established a large number of tourists will be return visitors (habit persistence); if they enjoyed their previous holiday to that country, they can reduce the risk of not enjoying their holiday by returning to a place they know they like. These factors have a stabilising effect on large flows which are thus easier to forecast is explained by Witt and Witt (1992).

The accuracy of econometric forecasts are beaten by several others as it happened in previous studies (Witt and Witt (1992)). Being third in most of the cases after HW and ARMA, supports the statement by Makridakis (1986 p.18) that "Econometric models are not necessarily more accurate than time series (extrapolative) models". A major advantage of econometric models over time-series models is that the former explicitly take into account the impact on the variable to be forecast of changes in the determining forces, which permits a tourism institution/company to link its forecasting with tactical and strategic plans for the future. Thus a company in the international tourism industry can use econometric forecasting systems to explore the consequences of alternative future polices on tourism demand ("what if" forecasting), which is not possible with time-series methods. The idea of tourism planning for North Cyprus which suffers lack of infrastructure and supply constraint demand situation, econometric forecasting seems inevitable. Therefore, the empirical results on forecasting accuracy in this thesis suggest that this is probably the major role of econometric models in tourism forecasting.

7.4. Conclusion

The main reason why we intended to use demand estimation and forecasting is to see the economic importance and policy implications implemented on small island states. Demand estimation is important for tourism of Cyprus. Since we are dealing with small island states, especially N. Cyprus, it may be important to select a regression model that will show the effect of supply constraints demand situation. As Archer (1976) pointed out "...unfilled airline seats and unused hotel rooms can not be stockpiled and demand must be anticipated and even manipulated". North Cyprus is facing insufficient bed spaces, airline transportation, and airport services, lack of infrastructure etc. Therefore, a model including lagged dependent variable is inevitable which is expected to pick up the changes in supply constraint situation. From our survey, we found Witt and Martin (1987) tourism demand model is suitable for our study. After we estimated demand, we found that there is strong economic relationship between the number of tourist arrivals and income per capita. For example in North Cyprus case, we obtained high income elasticities from Germany (1.475) and in Malta case we obtained high income elasticities from Austria(6.893), Germany(1.076), the UK(1.233) and the USA(2.692). Other than income, price variable was found significant in many cases. For example from Germany to Malta the price coefficient was found highly elastic (-1.649) and from Libya to Malta it is (-1.892). From our forecasting results we reached to a conclusion that econometric model was not successful for long term forecasting of tourism demand for small island states.

From our discussion of forecasting it should be clear that accurate forecasting requires not only the correct economic theory but also correct decisions at each of the remaining stages in the forecasting procedure. In other words, forecasts are a combination of economic theory and the judgement of the forecasters. From this perspective, the most important determinant of forecasting accuracy is the prediction of future government behaviour and the values of the exogenous variables.

There is no general agreement amongst forecasters as to which method is the best. In so far as comparisons of different techniques have been made, there is a consensus that extrapolation methods are preferred for short-run forecasting, and econometric models for long-run forecasting. However, much of this evidence is based on particular case-studies and it is not clear that the results are generally valid. In fact, in our study econometric models did not prove the best results for long-run forecasting.

When different versions of the same technique are compared, such as the forecasts from different econometric models, the evidence is that, while one organisation may give the best forecasts for a particular variable over a given horizon and for a certain historical period, changing any of these factors results in an alternative forecaster being preferred. Similar evidence occurs for time-series methods. From the results given in Table 7.8 and Table 7.9 we found that econometric forecasts is not the best forecasting method when RMSE forecasting accuracy was used for five and two years ahead forecast horizon.

As a conclusion, econometric models are generally more expensive than univariate time-series methods, and require considerable user understanding in order to develop the correct relationships. In addition, a major problem in attempting to generate accurate forecasts of tourism demand using econometric models is the difficulty of obtaining accurate forecasts of the variables which influence demand.

Hence, in order for it to be worthwhile to use econometric models for the generation of forecasts of international tourism demand, these forecasts must be more accurate than those generated by univariate time-series methods. It has been shown, however, that this is not the case (when accuracy is specified in terms of error magnitude). It appears, therefore, that the main use of econometric models to a practitioner is with respect to the identification of the size of the effects that changes in the explanatory variables are likely to have upon tourism demand, and not as a direct forecasting tool. Econometric forecasting may be used for active ("what if") forecasting, where the consequences of possible changes in the determining forces can be assessed, which is not possible with non-causal forecasting methods. However, their usefulness in passive forecasting is debatable.

Ch 8 : Conclusion

8.1 Summary Of The Research

This chapter concludes the thesis with a summary of important issues that we investigated and empirical findings obtained. The related policy implications give us brief understandings and guidance for the future research on international tourism management and tourism demand. There are three aims in this thesis that we tried to specify clearly. Since we are interested in *small island states* and our strategies are to develop the small island economies, we firstly pointed out that for most of the small island nations, tourism is the biggest potential and seems the pioneer of the economy. Therefore, Porter's (1990) *National Diamond* has been suggested to North Cyprus. This model is very popular and has been in use in many South Asian countries for more than a decade. The diamond is designed with i) *Factor Conditions*, ii) *Demand Conditions*, iii) *Firm, Strategy, Structure and Rivalry*, and vi) *Related and Supporting Industries*. The diamond is also supported by the *Role of Government* and *Role of Chance* mutually. We therefore suggest this model to North Cyprus in chapter one which is competitively advantageous with good sand-sea-sun package offer. Tourism is the only sector that will be the pioneer to overcome the shortcomings of the economy, and create a chance of having economic independency. According to Porter technology and knowledge (know how) are the two most important preconditions in achieving the national advantage. Porter explaines the National Competitive Development Model into four distinct stages such as; *factor driven, investment driven, innovation driven and wealth driven.* The first three stages involve successive upgrading of a nation's competitive advantages and will normally be associated with progressively rising economic prosperity. The fourth stage is one of drift and ultimately decline. These stages, though brought schematics, provide one way of understanding how economies develop, the characteristic problems faced by nation's firms at different points in time, and the forces that propel the economy to advance or cause it to falter. Within this framework, we implemented Butler's (1980) tourist area life cycle theory on North Cyprus and the Isle of Man (chapter 4) to see how Porter's four stages are achieved over the periods.

The second aim is to support the idea that the *location and geography* of the small island nations are important when trade is concerned. It is widely debated by Krugman (1992) that *transportation cost* and *labour pooling* are important issues that makes the country economically important and advantageous. Since we found Krugman's approaches appropriate and valuable for our arguments, we gave a broad explanation in chapter two to make the subject more understandable. By economic geography, Krugman meant *"the location of production in space";* that is, that branch of economics that worries about where things happen in relation to one another. According to this argument, countries are normally modelled as dimensionless points within which factors of production can be instantly and costlessly moved from one activity to another, and even trade among countries is usually given a sort of spaceless representation in which transport costs are zero for all goods that can be traded. We thought it will be useful to make a link between Porter's (1990) and Krugman's (1992) approaches in chapter two and three, because they proved that nations can restructure their economies through impoving technology, creating skilled labour pooling and establishing core regions before they restart to trade with other nations. Indices measures are used to identify the regions' specialisation in the tourism sector in the NW of the UK, South Turkey, the IOM and North Cyprus. The IOM is found to be more specialised than North Cyprus and South Turkey (Antalya) is found to be more specialised than North Cyprus when tourist premises are compared. Though both theorists want to explain the same phenomenon, namely the nation's economic prosperity, they sometimes contradict each other. That is why we needed to give criticism on both theorists in chapter three.

Porter (1991) is against classical economists, because he says that National prosperity grows out on the capacity of the nations industry to innovate and upgrade, but not through a country's natural endowments, its labor pool, its interest rates, or its currency values as classical economists insist. A nation's competitiveness depends on the capacity of its industries to innovate and upgrade.

As long as the labor costs, interest rates, exchange rates and economies of scale are the most patent determinants of competitiveness, then why can we not consider the classical economists' pool of labor as the most important direct tool in the determination of national prosperity. There is no doubt that a nation's industry to innovate and upgrade is very important as far as technology is concerned in manufacturing industries, but it should not be generalized as the exclusive way for growing the national prosperity. Where the international economy is concerned, Krugman (1993a) made another argument and debated on; if we want to understand differences in national growth rates, a good place to start is by examining differences in regional growth; if we want to understand international specialization, a good place to start is with local specialization. The geographical issues that economic geographers should worry about are the locations where production is taking place. Especially where service is concerned, this becomes even more important.

Krugman (1993) has also underlined that the time has come to use the same new tools to resurrect economic geography as a major field within economics. It is no longer the case that the need to model increasing returns makes a field untouchable. Instead, increasing returns are, at the moment fashionable. Therefore, Porter's criticism about classical economists is not strong enough and Krugman's approach on economic geography is strengthening the labor pool idea where Porter was against. Yet, there is a compromising point between two theorists, that both are defending the nation's economic prosperity.

Throughout this research, another principal argument has rested on the tourism's evolution at any destination which corresponds Butler's (1980) tourist area life cycle stages. Besides that, we implemented Butler's life cycle to the Isle of Man as it did by Cooper and Jackson (1990) and we tried to analyse the tourism development from the environment perspective. However, the existing information make it extremely difficult to determine the exact points of transition from one stage to another. Nevertheless, the IOM is experiencing stagnation stage and therefore rejuvenation strategies are developed to save the island's tourism from declining stage. On the other hand, the same model (Butler 1980) also applied on North Cyprus tourist industry and we developed a *Tourism Master Plan* which consists many development policies as a portfolio for the whole industry. We also tried to explain the multiplier effect of tourism master plan . North Cyprus resort cycle is assumed to move from development to consolidation. Yet, we still argue that North Cyprus has not yet witnessed a prolonged period of development which is characterised by a dramatic take-off in arrivals from foreign countries, coupled sustained improvements to its infrastructure. Hence, the island has a potential to achieve the consolidation stage if tourism master plan idea have inevitable application. During the transitional period, the island states are facing some problems of infrastructural investments. Government is the initiator in the beginning of at most cases and transnational or multinational corporations follows up in the host country. But, is it beneficial to invite transnational to invest? We discussed the positive and negative consequences in chapter 3. Policy makers in every country must come to the realisation that no longer should domestic elite's and MNCs reap a major portion of the sector's profits without bearing at least partial responsibility for the substantial costs that conveys onto host societies. Environmental awareness and sustainability is therefore an important issue that small island states should take into consideration before deciding to expand their industries.

Another main hypothesis undertaken in this thesis is the modelling of tourism demand and has contributed to the rigorous study of variables that affect the demand for tourism. The examination of tourism indicators, such as tourist arrivals, describes the trends in tourism demand as well as the important role in economics. A review of the literature on previous studies of tourism demand provided a background for the approach that has been followed in the thesis. During the forecasting the various quantitative and qualitative approaches are discussed, but emphasis was placed on the single equation econometric study. The discussion in chapter 5 and 6 critically analysed the advantages and limitations of previous studies. Cointegration analysis and Johansen error correction mechanism dominated the thesis and has implemented for the tourism demand models to see the long-run economic relationship. It was concluded that many previous research has paid little or no attention to the provision of a theoretical framework for the proposed models, directly linked to the economic theory of demand for tourism. Cointegration has very recent history in the literature and gained a lot of popularity during the past decade and Kulendran (1996) and Kulendran and King (1997) are the most recent examples on tourism demand modelling. Moreover, empirical inadequacies (e.g. poor diagnostic testing, statistically unreliable results) seem to project some doubt on validity on many of these studies. Variations in tourist arrivals over time are shown to be related to changes in income, cost of living, exchange rates, airfares, surface costs and seasonality as well as social and political factors. The elasticity values of the demand for tourism differ between tourists of different nationals and the whole results are tabulated in chapter 7.

The effects of price and exchange rate variables are also shown in the previous chapter and exchange rates were found to be an important variable in explaining tourism demand changes both in the long-run and short-run period. Because we had a very large sample and many combinations in our study, we only chose randomly selected countries tourist flows to Malta (Malta inbound) and to North Cyprus (N. Cyprus Inbound) as an example to explain the coefficient elasticities. You can see the details in Table-7.6 and Table-7.7.

8.2 Suggestions For Further Research

To conclude, both regression and cointegration contribute important insights about the determinants of tourism demand as well as useful related policy implications. With respect to a simple or complex forecasting method performing better on less aggregated series, statistical differences between methods generally are few, however Holt-Winters additive smoothing method is always ranked first for the long-term forecast and autoregressive the second. On the other hand, for one year forecast Holt-Winters does not have the highest accuracy (see details in chapter 7). Another hypothesis was made when we analysed overall forecasting accuracy techniques.

We used RMSE as a forecasting accuracy technique and we obtained a disappointing result which econometric forecast is not the best forecasting method in comparison to autoregressive methods for 5 and 2 years forecast horizon. We used aggregated data in our study since it is not always possible to find the disaggregated tourist data especially for the period before 1980. However, there is no evidence that the more complex forecasting methods perform better on the aggregate series. From past research, it had been found that the forecasts of disaggregated air flows are more accurate than the forecast of the aggregated air and surface flows. However, the average forecast error of the disaggregated surface flows are statistically worse. The deficiencies of data put limitations on forecasting generally and on this thesis in particular. Whenever we faced difficulties to find quarterly data for income, we used interpolation techniques to create our own proxy data. Further research using monthly or weekly series would clearly be of interest.

Tourism demand flows which are less aggregated than those in this thesis could be studied. For example,

1. forecasting tourist flows by private airline company
2. forecasting tourism receipts by private airline company, or
3. forecasting number of people intended to stay overnight in a hotel accommodation etc.

could be examined. Whether it is possible to identify a "best" forecasting method for the number of flows or the receipts, is another question. Archer (1976, 1980, 1987), Uysal and Crompton (1985), Martin and Witt (1987), Witt and Witt (1992) and Kulendran and King (1997) are some of the selected papers and books particularly in this field. Some of the other difficulties you may face is to find expensive and highly complex computer packages that needs a lot of time to learn and practice for forecasting empirical models. Contribution of technology, however, made it easier for the practitioners to compute and analyse the data and complex models.

BIBLIOGRAPHY

ACERENZA, M. A. (1985) Planification estrategica del turismo: esquema methodologico. Estudios Turisticos, 85, pp.47-70, ***in*** PEARCE, D. (eds) ***Tourist Development***, Essex: Longman Group Ltd.

AHMAD, J. AND HARNHIRUN, S. (1996) Cointegration and causality between exports and economic growth: evidence from the Asian countries, ***Canadian Journal of Economics***, 29, pp.413-416.

AKIS, S. (1998) Research Note: A compact model of tourism demand for Turkey, ***Tourism Management***, 19(1), pp.99-102.

ANASTASOPOULOS, P. G. E. (1984) ***Interdependencies in International Travel: The Role of Relative Prices- A Case Study of the Mediterranean Region***. Ph.D. Thesis, New School for Social Research, ***in*** CROUCH, G. I. (1994) (ed.) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

APERGIS, N. (1997) Inflation Uncertainty, Money Demand, and Monetary Deregulation: Evidence from a Univariate ARCH Model and Cointegration Tests, ***Journal of Policy Modelling***, 19(3), pp.279-293.

ARCHER, B. (1987) Demand forecasting and estimation. ***in*** RITCHIE, J. R. B. and GOELDNER, C. R. (eds.), ***Travel, Tourism and Hospitality Research***. New York: John Wiley & Sons, Inc., pp.77-85.

ARCHER, B. H. (1980) Forecasting Demand: Quantitative and Intuitive Techniques. ***International Journal of Tourism Management,*** 1(1), pp. 5-12.

ARCHER, B. H. (1976) ***Demand Forecasting in Tourism***. No:9, University of Wales Press, Bangor Occasional Papers in Economics, UK

ARTUS, J. R. (1972) An Econometric Analysis of International Travel. ***International Monetary Fund Staff Papers***, 19(3), pp. 579-614.

ARTUS, J. R. (1972) An Econometric Analysis of International Travel. ***IMF Staff Papers***, (19), pp.579-614.

ARTUS, J. R. (1970) The Effect of Revaluation on the Foreign Travel Balance of Germany. ***International Monetary Fund Staff Papers***, 17, pp. 602-19.

ASKARI, H. (1971) Demand for Package Tours. ***Journal of Transport Economics and Policy***, 5(1), pp.40-51.

ATKINSON, J. (1984) Flexibility, Uncertainty and Manpower Management. Institute of Manpower Studies, Report 89, Falmer: University of Sussex, ***in*** WILLIAMS, A. M. and SHAW, G. (1994) (eds.) ***Critical Issues in Tourism: A Geographical Perspective.*** Oxford : Blackwell Publishers, p.145.

BANERJEE, A. AND SMITH, G. (1986) Exploring Equilibrium Relationships in Econometrics Through Static Models : Some Monte Carlo Evidence, ***Oxford Bulletin of Economics and Statistics***, 48, pp.253-277.

BarOn, R. R. V. (1975) ***Seasonality in Tourism: A guide to the analysis of Seasonality and trends for policy making***. EIU, London.

BARRY, K and O'Hagan, J. (1972) An econometric study of British tourist expenditure in Ireland. ***Economic and Social Review***, 5(2), pp. 143-61.

BASTIN, R. (1984) Small Island Tourism: Development or Dependency? ***Development Policy Review***, 2, pp.79-80.

BECHDOLT, B. V. (1973) Cross-sectional travel demand functions: US visitors to Hawaii, 1961-70. ***The Quarterly Review of Economics and Business***, 13(4), pp. 37-47.

BLACKWELL, J. (1970) Tourist traffic and the demand for accommodation: some projections. ***Economic and Social Review***, 1(3), pp. 323-43.

BOND, M. E. and LADMAN, J. R. (1972) International Tourism and Economic Development: a special case for Latin America. ***Mississippi Valley Journal of Business and Economics,*** 8(1), pp. 43-55.

BONHAM, C.S. and GANGNES, B. (1996) Intervention analysis with cointegrated time series: the case of the Hawaii hotel room tax, ***Applied Economics***, 28, pp.1281-1293.

BONIFACE, B. G. and COOPER, C. P. (1987) ***The Geography of Travel and Tourism.*** R. J. Actforf ltd, Chichester, Great Britain.

BOOT, J. C. G., FEIBES, W., and LISMAN, J. H. C. (1967) Further Methods of Derivation on Quarterly Figures From Annual Data. ***Applied Statistics***, Vol.16, pp.65-75.

BOSCHECK, R, (1994) Competitive Advantage: Superior Offer or Unfair

BOWER, P. (1995) ***Cyprus and the United Nations.*** Research Paper 95/31, March, International Affairs and Defence Section, House of Commons Library.

BOX, G. E. P. and JENKINS, G. M. (1970) Time Series Analysis: Forecasting and Control, San Francisco: Holden-Day. ***in*** RITCHIE, J. R. B. and GOELDNER, C. R. (1987) (eds.) ***Travel, Tourism, and Hospitality Research: A Handbook for Managers and Researchers***. New York: John Wiley & Sons.

BRADDON, C. J. H. (1982) ***British Issues Paper: Approaches to Tourism Planning Abroad.*** London: British Tourist Authority.

BRAINARD, L. S. (1993) A Simple Theory of Multinational Corporations and Trade with a Trade-Off Between Proximity and Trade. ***NBER Working Paper Series,*** No.4269, MA, USA.

BRAINARD, L. S. (1993) An Empirical Assessment of the Factor Proportions Explanation of Multinational Sales. ***NBER Working Paper Series,*** No.4583, MA, USA.

BRAINARD, L. S. (1993) An Empirical Assessment of the proximity Concentration Trade-Off Between Multinational Sales and Trade. ***NBER Working Paper Series,*** No.4580, MA, USA.

BREMNES, H., GJERDE, O. and SAETTEM, F. (1997) A multivariate cointegration analysis of interest rates in the Eurocurrency market, ***Journal of International Money and Finance***, 16(5), pp.767-778.

BREZIS, E. S. and KRUGMAN, P. R. (1993) Immigration, Investment, and Real Wages. ***NBER Working Paper Series,*** No.4563, MA, USA.

BRITTON, R. A. (1978) International tourism and Indigenous Development Objectives: A Study with Special Reference to the West Indies. Ph.D. diss. Faculty of the Graduate School of the University of Minnesota, ***in*** BRITTON, S. G. (1981) ***Tourism Dependency and Development: a mode of analysis.*** Occasional Paper, No.23, Development Studies, Canberra: Australian National University.

BUCKLEY, P. J., NEWBOULD, G. D. and THURWELL, J. (1988) ***Foreign Direct Investment by Smaller UK Firms***, London: Macmillan.

BUTLER, R. W. (1980) The Concept of a Tourism Area Cycle of Evolution: Implication for Management Resources. ***The Canadian Geographer***, 24(1), pp.5-12.

CAMPOS, J., ERICSSON, N.R. and HENDRY, D.F. (1996) Cointegration tests in the presence of structural breaks, ***Journal of Econometrics***, 70, pp.187-220.

CAVES, R. E. (1982) ***Multinational Enterprise and Economic Analysis.*** Cambridge: Cambridge University Press.

CHADEE, D., and MIECZKOWSKI, Z. (1987) An Empirical Analysis of the Effects of the Exchange Rate on Canadian Tourism. Journal of Travel Research, 26(1), pp. 13-17, ***in*** COCHRANE, D. and ORCUTT, G. H. (1949) (eds.) Application of Least Squares Regression to Relationships Containing Autocorrelated Error Terms. ***Journal of the American Statistical Association***, 44, pp.32-61.

CHAREMZA, W.W. and DEADMAN, D.F. (1997) ***New Directions in Econometric Practice: General to Specific Modelling, Cointegration and vector Autoregression***, 2nd ed. Edward Elgar Publishing Limited, Cheltenham, UK.

CHOY, D. J. L. (1984) Forecasting Tourism Revisited. ***Tourism Management***, 5(3), pp. 171-176.

COCHRANE, D. and ORCUTT, G. H. (1949) (eds.) Application of Least Squares Regression to Relationships Containing Autocorrelated Error Terms. ***Journal of the American Statistical Association***, 44, pp.32-61.

COHEN, E. (1979) A phenomenon of tourist experiences. Sociology, 13, pp.179-202, ***in*** WILLIAMS, A. M. and SHAW, G. (1994) (eds.) p.71, ***Op cit.***

COHEN, E. (1972) ***Towards a sociology of international tourism***. Social Research, 39(1), pp. 164-82.

COOPER, C. P and JACKSON, S. (1989) Destination Life Cycle: The Isle of Man Case Study. ***Annals of Tourism Research***, 16, pp.377-398.

COOPER, C. P and JACKSON, S. (1985) Changing Patterns of Manx Tourism. Geography, 70, pp.74-6, ***in*** COOPER, C. P and JACKSON, S. (1989) Destination Life Cycle: The Isle of Man Case Study. ***Annals of Tourism Research***, 16, p.384.

COOPER, C. P. (1990) ***The Life-cycle concept and tourism***. Conference paper presented at Tourism Research into the 1990s' University of Durham, ***in*** WILLIAMS, A. M. and SHAW, G. (1994) p.165, ***Op cit***.

CROUCH, G. I. (1994a) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

CROUCH, G. I. (1994b) The Study of International Tourism Demand: A Review of Findings. ***Journal of Travel Research,*** 33(1), pp.12-23.

DAVIDSON, J.H., HENDRY, D.H., SRBA, F. and YOO, S. (1978) Econometric modelling of the aggregate time-series relationship between consumers' expenditure and income in the United Kingdom, ***The Economic Journal***, 88, pp.661-692.

DAWES, B. and D'Elia, C. (1995) Towards History of Tourism: Naples and Sorrento (XIX Century). ***Tijdschrift voor Economische en Sociale Geografie***, 86(1), pp. 13-20.

DEBBAGE, K. G. (1990) Oligopoly and the resort cycle in the Bahamas. Annals of Tourism Research, 17, pp.513-27 ***in*** WILLIAMS, A. M. and SHAW, G. (1994) p.165, ***Op cit***.

DEMETRIADES, P and AL-JEBORY, A. and KAMPERIS,G.(1993) Manufacturing Exports, Economic Growth and the Current Account in a Small Island Economy: Simulation Results from an Econometric Model for Cyprus. ***World Development***, 21(2), pp.259-268.

DICKEY, D.A. (1993) Discussion: Seasonal unit roots in aggregate US data, ***Journal of Econometrics***, 55, pp.329-331.

DICKEY, D.A. and FULLER, W.A. (1981) The Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root, ***Econometrica***, 49, pp.1057-1072.

DICKEY, D.A. and FULLER, W.A. (1979) Distribution of the Estimators for Autoregressive Time Series with a Unit Root, ***Journal of the American Statistical Association***, 74, pp.427-431.

DICKEY, D.A., HASZA, D.P. and FULLER, W.A. (1984) Testing for Unit Roots in Seasonal Time Series, ***Journal of the American Statistical Association***, 79(386), pp.355-367.

DICKEY, D. A. and PANTULA, S. S. (1987) Determining the order of differencing in autoregressive process. Journal of Business and Statistics, Vol.5, pp.455-461.

DOERINGER, P. B. and PIORE, M. J. (1971) Internal Labour Markets and Manpower Analysis, Lexington: Lexington Books, ***in*** WILLIAMS, A. M. and SHAW, G. (1994) (eds.) ***Op cit.***

DOMMEN, E. (1982) ***External Trade Problems of Small Island States in the Pacific and Indian Oceans.*** UNCTAD Discussion papers, No:23, p.188.

DUNNING, J. H. (1981) ***International Production and the Multinational Enterprise.*** London: George Allen and Unwin.

DUNNING, J. H. (1977) Explaining Changing Patterns of International Production: In Defence of the Eclectic Theory. Oxford Economic Paper, Vol.41, ***in*** DUNNING, J, H. and McQUEEN, M. (1982) ***Multinational Corporations in the International Hotel Industry***. Annals of Tourism Research, 19, pp.82.

DUNNING, J. H. and McQueen, M. (1982) The Eclectic Theory of the Multinational Enterprise and the International Hotel Industry. ***in*** RUGMAN, A. M. (ed.) ***New Theories of the Multinational Enterprises: Internalisation and Non-Equity forms of International Involvement.*** Kent: Croom Helm ltd.

DUNNING, J. H. and NORMAN (1979) Intra-industry foreign direct investment: its rationale and trade effects. ***Weltwirtschafliches Archiv,*** 120, 1954, pp.522-540.

DURBIN, J. and WATSON, G. S. (1971) Testing for Serial Correlation in Least Squares Regression - III. ***Biometrica***, 58, pp.1-42.

DURBIN, J. and WATSON, G. S. (1951) Testing for Serial Correlation in Least Squares Regression - II. ***Biometrica***, 38, pp.159-178.

DURBIN, J. and WATSON, G. S. (1950) Testing for Serial Correlation in Least Squares Regression - I. ***Biometrica***, 37, pp.409-428.

DYCK, H. C. and EMERY, J. G. (1970) Social Futures Alberta 1970-2005. Edmonton: Human Resources Research Council of Alberta. ***in*** UYSAL, M. and CROMPTON, J. L. (1985) (eds.) An Overview of Approaches Used to Forecast Tourism Demand. ***Journal of Travel Research***, 23(4), pp.7-15.

ECONOMIST INTELLIGENCE UNIT (EIU) (1975) Currency Changes, Exchange Rates and Their Effects on Tourism. ***International Tourism Quarterly***, Special Article,18(4), pp. 34-45. ***in*** CROUCH, G. I. (1994) (ed.) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

ECONOMIST INTELLIGENCE UNIT (EIU) (1972) The Impact of Currency Changes on the International Tourism Industry. ***International Tourism Quarterly***, Special Article, 3(1), pp. 46-52. ***in*** CROUCH, G. I. (1994) (ed.) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

EDWARDS, A. (1979) ***International Tourism Development Forecasts to 1990***. Special Report No. 62. London: The Economist Intelligence Unit, Ltd.

EDWARDS, A. (1976) ***International Tourism Development Forecasts to 1985***. Special Report No. 33. London: The Economist Intelligence Unit, Ltd.

ENGLE, R.F. and GRANGER, C.W.J. (1987) Co-integration and Error Correction: Representation, Estimation and Testing, ***Econometrica***, 55(2), pp.251-276.

ENGLE, R.F. and YOO, B.S. (1987) Forecasting and Testing in Cointegrated Systems, ***Journal of Econometrics***, 35, pp.143-159.

ENGLE, R.F. and YOO, B.S. (1991) Cointegrated Economic Time Series : An Overview with New Results, ***in*** ENGLE, R.F. and GRANGER, C.W.J. (eds.) ***Long-run Economic Relationships : Readings in Cointegration***, New York: Oxford University Press.

ENGLE, R.F., GRANGER, C.W.J., HYLLEBERG, S. and LEE, H.S. (1993) Seasonal Cointegration: The Japanese Consumption Function, ***Journal of Econometrics***, 55, pp.275-298.

ETB (1994) English Tourist Board, Statistics Yearbook, Her Majesty's Statistics Office, London.

EVIEWS 2-0 (Econometric Views - version 2.0) (1994-1995) Quantitative Micro Software, 4521 Campus Drive, Suite 336, Irvine, California 92715.

FINANCIAL TIMES SURVEY, (1995) ***Isle of Man***. Wednesday, April 5.

FRIEDMANN, J. (1972) A general theory of polarised development, ***in*** TODTLING , F. (1984) (ed.) ***Regional Studies***, 18(5), pp. 397-412.

FRITZ, R. G., BRANDON, C. and XANDER, J. (1984) Combining time-series and econometric forecasts of tourism activity. ***Annals of Tourism Research***, 11, pp.211-229.

FUJII, T. E. and MAK, J. (1980) Forecasting Travel Demand when the Explanatory Variables are Highly Correlated. ***Journal of Travel Research***, 18, pp.31-34.

GAYNOR, P. E. and KIRKPATRICK, R. C. (1994) ***Introduction to Time-Series Modelling in Business and Economics***. McGraw-Hill, Inc. New York, USA.

GERAKIS, A. S. (1966) Economic Man: The Tourist? ***Finance and Development***, 3(1), pp. 41-48. ***in*** CROUCH, G. I. (1994) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

GERAKIS, A. S. (1965) Effects of Exchange-Rate Devaluations and Revaluations on Receipts from Tourism. ***International Monetary Fund Staff Papers,*** 12(3), pp.

365-84. ***in*** CROUCH, G. I. (1994) (ed.) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

GETZ, D. (1987) Tourism Planning and Research Traditions, Models and Futures. Paper presented at Australian Travel Research Workshop, Bunbury, 5-6 November 1987 (mimeo), ***in*** PEARCE, D. (1994) (ed.) ***Tourist Development***. Essex: Longman Group Ltd.

GHATAK, S., MILNER, C. and UTKULU, U. (1997) Exports, export composition and growth: cointegration and causality evidence for Malaysia, ***Applied Economics***, 29, pp.213-223.

GHYSELS, E., LEE, H.S. and NOH, J. (1994) Testing for unit roots in seasonal time series, ***Journal of Econometrics***, 62, pp.415-442.

GIBBONS, J. D. and FISH, M. (1985) Devaluation and US Tourism Expenditures in Mexico. Annals of Tourism Research, 12(4), pp. 547-61, ***in*** CROUCH, G. I. (1994) (ed.) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

GINSBURGH, V. A. (1973) A Further Note on the Derivation of Quarterly Figures Consistent with Annual Data, ***Applied Statistics***, 22(3), pp.369-375.

GONZALES, P. and MORAL, P. (1995) An analysis of the international tourism demand in Spain, ***International Journal of Forecasting***, 11, pp.233-251.

GORE, C. (1994) ***Development Strategy in East Asian Newly Industrialising Economies: The Experience of Post-War Japan, 1953-1973.*** UNCTAD Discussion paper, No:92, Nov.

GRAHAM, F.D. (1948) ***The Theory of International Values*** , Princeton University Press, Princeton.

GRANGER, C.W.J. (1981) Some Properties of Time Series Data and Their Use in Econometric Model Specification, ***Journal of Econometrics***, pp.121-130.

GRAY, H. P. (1966) The demand for international travel by the United States and Canada. ***International Economic Review***, 7(1), pp. 83-92.

GRIFFITHS, W.E., HILL, R.C., and JUDGE, G.G. (1993) ***Learning and Practising Econometrics***. New York: John Wiley & Sons, Inc.

GRONAU, R. (1970) The value of time passenger transportation: the demand for air travel. National Bureau of Economic Review, 7, pp. 83-92. ***in*** SYRIOPOULOS, T. C. (1995) A dynamic model of demand for Mediterranean tourism. ***International Review of Applied Economics,*** 9(3), pp.318-37.

GUARDIAN, ***Forte falls to Granada.*** 24 January, 1996. Wednesday, pp.17-18.

GUJARATI, D. (1992) ***Basic Econometrics***, McGraw Hill Publishing Company, New York, USA.

GUJARATI, D. (1988) ***Essentials of Econometrics***, McGraw Hill Publishing Company, New York, USA.

GUNADHI, H. and CHOW, K. B. (1986) Demand elasticities of tourism in Singapore. Tourism Management, 7, pp. 239-53. ***in*** ONG, C. (1995) Tourism demand models: a critique. ***Mathematics and Computers in Simulation,*** 39, pp.367-72.

GUNN, C. A. (1988) Tourism Planning. New York: Taylor and Francis, ***in*** WILLIAMS, A. M. and SHAW, G (1994), p.5, ***Op cit.***

GUTHRIE, H. W. (1961) Demand for tourists' goods and services in a world market. ***Papers and Proceedings of the Regional Science Association***, 7, pp.159-75.

HALL, P. (1970) ***Theory and Practice of Regional Planning***. London: Pamberton Books.

HARRINGTON, J. W. J. (1995) Producer Services Research in U. S. Regional Studies. ***Professional Geographer***, 47(1), pp. 87-96.

HAYWOOD, K. M. (1986) Can the tourists are life cycle be made operational? Tourism Management, 17, pp.154-67, ***in*** WILLIAMS, A. M. and SHAW, G. (1994) p.165, ***Op cit***.

HEALEY, M. J. and ILBERY, B. W. (1990) ***Location and Change: Perspectives on Economic Geography.*** New York: Oxford University Press, p.88.

HELPMAN, E. (1985) Multinational Corporations and Trade Structure. ***Review of Economic Studies,*** 52, pp.443-457.

HELPMAN, E. (1984) A Simple Theory of International Trade with Multinational Corporations. ***Journal of Political Economy,*** 92(3), pp.451-471.

HELPMAN, E. and KRUGMAN, P. R. (1985) ***Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition and the International Economy***, Wheatsheaf Books ltd, UK.

HENDRY, M. (1995) Government under pressure to sign Rio convention. ***Isle of Man Courier,*** Oct 26, Thursday, Douglas: Verified Free Distribution Ltd.

HO, M.S. and SORENSEN, B.E. (1996) Finding Cointegration Rank in High Dimensional Systems Using the Johansen Test: An Illustration Using Data Based Monte Carlo Simulations, ***The Review of Economics and Statistics***, 78(4), pp.726-732.

HOLDEN, K. and THOMPSON, J. (1992) Cointegration : An Introductory Survey, ***British Review of Economic Issues***, 14(33), pp.1-55.

HOLDEN, K., PEEL, D. A. and THOMPSON, J. L. (1990) ***Economic forecasting: an introduction***. New York: Cambridge University Press, USA.

HOLLOWAY, J. C. (1983) The Business of Tourism. Macdonald and Evans, ***in*** BONIFACE, B. G. and COOPER, C. P. (1987) (eds.) ***The Geography of Travel and Tourism,*** pp.5-7.

HOLT, C. C. (1957) Forecasting Seasonal and Trends by Exponentially Weighted Moving Averages. Carnegie Institute of Technology Research Paper, Pittsburgh. ***in*** WITT, S. F. and MOUTINHO, L. (eds.) (1994) ***Tourism Marketing and Management Handbook.*** 2nd ed., Prentice Hall International (UK) Ltd.

HOOVER, E. M. (1948) ***The Location of Economic Activity.*** New York: McGraw-Hill.

HOUT, T., PORTER, M. E., and RUDDEN, E. (1991) How global companies win out. ***in*** PORTER, M. E (ed.) On Competition and Strategy. ***Harvard Business Review Paperback***, No.90079, USA.

HOWELLS, J. R. L. (1984) Location of Research and Development: Some Observations and Evidence from Britain. ***Regional Studies***, 18(1), pp. 13-29.

HSIAO, F. C. (1997) Statistical Properties of the Two-Stage Least Squares Estimator Under Cointegration, ***Review of Economic Studies***, 64, pp.385-398.

HYLLEBERG, S., ENGLE, R.F., GRANGER, G.W.J. and YOO, B.S. (1990) Seasonal Integration and Cointegration, ***Journal of Econometrics***, 44, pp.215-238.

IMF annual : ***International Financial Statistics***. International Monetary Fund, Washington DC.

INTRILIGATOR, M. D. (1978) ***Econometric Models, Techniques, and Applications***. Oxford: North Holland Publishing Company.

IOANNIDES, D. (1995) Strengthening the Ties Between Tourism and Economic Geographie: A theoretical Agenda. ***Professional Geographer***, 47(1), pp. 49-60.

IOANNIDES, D. (1994) ***The State, Transnationals, and The Dynamics of Tourism Evolution in Small Island Nations.*** Ph.D. diss., Rutgers University, new Brunswick, NJ.

IOANNIDES, D. (1992) ***Tourism Development Agents: the Cypriot Resort Cycle.*** Annals of Tourism Research, 19(4), pp.711-731.

IOM. (1994) ***Digest of Economic and Social Statistics***. Economic Affairs Division, IOM Treasury.

JAFARI, J. (1977) Editor's Page. ***Annals of Tourism Research***, 5(sp. No): pp.6-11.

JOHANSEN, S. (1991) Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models, ***Econometrica***, 55, pp.1551-1580.

JOHANSEN, S. (1988) Statistical analysis of cointergration vectors, ***Journal of Economic Dynamics and Control***, 12, pp.231-254.

JOHANSEN, S. AND JUSELIUS, K. (1990) Maximum likelihood estimation and inference on cointegration with application to the demand for money, ***Oxford Bulletin of Economics and Statistics***, 52, pp.169-209.

JUD, G. D. (1971) ***The Demand for Tourism: The Case of Latin America***. Ph.D. Thesis, University of Edinburgh. ***in*** CROUCH, G. I. (1994) (ed.) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

JUD, G. D. and JOSEPH, H. (1974) International Demand for Latin American Tourism. ***Growth and Change,*** 5(1), pp. 25-31.

JUDGE, G. G. HILL, R. C. GRIFFITHS, W. E., LUTKEPOHL, H. and LEE, T. C. (1988) ***Introduction to The Theory and Practice of Econometrics***. 2nd ed., Canada: John Wiley & Sons, Inc.

KAMINARIDES, J. and BRIGUGLIO, L. (1993) Island and Small States Issues and Policies, ***World Development***, 21(2), pp.193-195.

KELLER, C. P. (1987) Stages of Peripheral Tourism Development - Canada's North West Territories. Tourism Management, 8 pp. 20-32.

KELLY, J. R. (1985) ***Recreation Business***. New York: John Wiley.

KLEIN, B., CRAWFORD, R. and ALCHAIN, A. A. (1978) Vertical Integration, Appropriate Rents, and the Competitive Contracting Process. ***Journal of Law and Economics,*** 21, pp.297-326.

KLIMAN, M. L. (1981) A quantitative analysis of Canadian tourism. ***Transportation Research***, 15 A, pp. 487-97. ***in*** SYRIOPOULOS, T. C. (1995) (ed.) A dynamic model of demand for Mediterranean tourism. ***International Review of Applied Economics,*** 9(3), pp.318-37.

KOJIMA, A. (1973) Reorganisation of North - South trade: Japan's foreign economic policy for the 1970s. Hitotsubashi Journal of Economics, 13(2), pp1-28, ***in*** GORE, C (1994) (ed.) ***Op cit.***

KRUGMAN, P. R. (1995) ***Development, Geography, and Economic Theory.*** Cambridge, Massachusetts: MIT Press.

KRUGMAN, P. R. (1994) ***Peddling Prosperity: Economic Sense and Nonsense in the Age of Diminished Expectations***. New York: W. W. Norton & Company, Inc. pp.225.

KRUGMAN, P. R. (1993b) On the number and the location of cities. ***European Economic Review,*** 37, pp.293-298.

KRUGMAN, P. R. (1991) Increasing Return and Economic Geography. ***Journal of Political Economy,*** 99(3),pp.483-498.

KRUGMAN, P. R. (1993) ***Geography and Trade.*** Cambridge, Massachusetts: MIT Press.

KRUGMAN, P. R. (1987a) Is Free Trade Passe ***? Economic Perspectives***, 1(2), pp.135-136.

KRUGMAN, P. R. (1987b) ***Strategic Trade Policy and the new International Economics.*** Cambridge: MIT Press, pp.36-49.

KRUGMAN, P. R. (1979a) Increasing Returns, Monopolistic Competition, and International Trade. ***Journal of International Economics.*** 9, pp.469-479.

KRUGMAN, P. R. (1979b) A Model of Innovation, Technology Transfer, and the World Distribution of Income. ***Journal of Political Economy,*** 87(2),pp.253-266.

KULENDRAN, N. (1996) Modelling quarterly tourist flows to Australia using cointegration analysis, ***Tourism Economics***, 2, pp.203-222.

KULENDRAN, N. and KING, M.L. (1997) Forecasting international quarterly tourist flows using error correction and time-series models, ***International Journal of Forecasting***, 2, pp.319-327.

KWACK, S. A. (1972) Effects of income and prices on travel spending abroad, 1960 III - 1967 IV'. ***International Economic Review***, 13(2), pp. 245-56.

LEAMING, G. F. and De GENNARO, N. (1974) City characteristics in the development of an air travel forecasting model: the case of Tucson, Arizona. ***Journal of Travel Research***, 12(3), pp. 7-9.

LEIPER, N. (1990) ***Rejoinders and Commentary. Annals of Tourism Research,*** 17, pp.600-5.

LEVITT, T. (1965) Exploit the Product Life Cycle. ***Harvard Business Review,*** 43, pp.81-94.

LICHTENBERG, R. M. (1960) ***On Tenth of a Nation.*** Cambridge, M. A: Harvard University Press.

LINDBERG, B. (1982) International Comparison of Growth in Demand for a New Durable Consumer Product, ***Journal of Marketing Research***, 19, pp.364-371.

LINDER, S. B. (1961) ***An Essay on Trade and Transformation***. New York: John Wiley & Sons.

LITTLE, J. S. (1980) International Travel in the US Balance of Payments. ***New England Economic Review*** (May/June), pp. 42-55.

MacKINNON, J.G. (1991) ***Critical values for cointegration tests.*** In R. F. ENGLE and C. W. G. GRANGER (eds.) Long- Run Economic Relationships, Oxford University Press, Oxford.

MAKRIDAKIS, S. and WHEELWRIGHT, S. C. (1978) ***Interactive Forecasting, Univariate and Multivariate Methods***. 2nd eds., San Francisco: Holden-Day.

MAKRIDAKIS, S (1986) ***Forecasting.*** San Francisco: Holden-Day.

MARKUSEN, J. R. (1995) The Boundaries of Multinational Enterprises and the Theory of International Trade. ***Journal of Economic Perspectives,*** 9(2), pp.169-189.

MARKUSEN, J. R. and HORTSMANN, I, J.G. (1987) Strategic investments and the development of multinationals. ***International Economic Review***, 28(1), pp. 109-121.

MARSHALL, A. (1920) ***Principles of Economics.*** London: Macmillan.

MARTIN, C. A. (1987) ***International tourism demand forecasting: a comparison of the accuracy of various quantitative forecasting techniques as applied to the main outward tourism flows from the GFR, France, the UK and the USA***. Ph.D. Thesis, University of Bradford, U. K.

MARTIN, C. A. and WITT, S. F. (1989) Forecasting tourism demand: A comparison of the accuracy of several quantitative methods. ***International Journal of Forecasting***, 5, pp.7-19.

MARTIN, C. A. and WITT, S. F. (1988) Substitute Prices in Models of Tourism Demand. ***Annals of Tourism Research***, 15(2), pp. 255-68.

MARTIN, C. A. and WITT, S. F. (1987) Tourism Demand Forecasting Models: Choice of Appropriate Variable to Represent Tourists' Cost of Living. ***Tourism Management***, 8(3), pp. 223-45.

MASIH, A.M.M. and MASIH, R. (1997) On The Temporal Causal Relationship Between Energy Consumption, Real Income and Prices: A Multivariate Cointegration/Vector Error-Correction Approach, ***Journal of Policy Modelling***, 19(4), pp.417-440.

MASSILIA, M. R. (1995) ***Economic Geography and Multinational Enterprise.*** Discussion Papers in Economics and Econometrics, n.9520, Dept. of Economics, University of Southampton, UK.

McALEER, M. and HOLMES, S. (1994) The search for truth: a diagnostic tale. ***Journal of Economic Surveys***, 8, pp. 317-70, ***in*** ONG, C. (1995) (ed.) Tourism demand models: a critique. ***Mathematics and Computers in Simulation,*** 39, pp.367-72.

McNEES, S. (1979) The Forecasting Record for the 1970's. ***New England Economic Review.*** Sep-Oct., pp.33-53.

MEYER- ARENDT, K. J. (1987) Resort evolution along the Gulf of Mexico littoral: historical, morphological and environmental aspects, unpublished PhD diss, Louisiana State University, ***in*** WILLIAMS, A. M. and SHAW, G. (1994) (ed.) p.166, ***Op cit.***

MIDDLETON, V. (1987) Marketing Holidays to Wales: Response to Market Changes. Revue de Tourisme, 42, pp.27-30, ***in*** COOPER, C. P. and JACKSON, S. (1989) ***Destination Life Cycle: The Isle of Man Case Study***. Annals of Tourism Research, 16, p.394.

MILL, J. S.(1909) ***Principles of Political Economy***. London: Longmans, Green.

MILNER, C. and WESTAWAY, T. (1993) Country size and the Medium-Term Growth Process: Some Cross-Country Evidence, ***World Development***, 21(2), pp.203-211.

MORLEY, C. L. (1994) The use of CPI for tourism prices in demand modelling. ***Tourism Management,*** 15(5), pp. 342-46.

MURPHY, P. E. (1980) Special Issue: Tourism Management in Host Communities. ***The Canadian Geographer***, 24(1), p.3.

OECD (1991) ***Tourism policy and international tourism in OECD member countries***. OECD, Paris.

OECD: ***National accounts statistics***. OECD, Paris.

OECD: ***Energy Price Statistics***, Quarterly Bulletin.

OLGUN, M. E. (1993) Economic impacts of tourism in North Cyprus, ***in*** DODD, H. (ed.) ***The Political, Social and Economic Development of Northern Cyprus.*** Huntingdon, Cambridgeshire: The Eothen Press, England.

OLIVER, F. R. (1971) The effectiveness of the UK travel allowance. ***Applied Economics,*** 3, pp. 219-26.

ONG, C. (1995) Tourism demand models: a critique. ***Mathematics and Computers in Simulation,*** 39, pp.367-72.

OSBORN, D.R. (1993) Discussion: Seasonal Cointegration, ***Journal of Econometrics***, 55, pp.299-303.

OSTERWALD - LENUM, M. (1992) A Note with Fractiles of the Asymptotic Cointegration Rank Test Statistics: Four Cases, ***Oxford Bulletin of Economics and Statistics***, Vol.54, pp; 461-472.

OXFORD DICTIONARY. (1991) Oxford University Press, UK.

PEARCE, D. G. (1987) Mediterranean charters - a comparative geographic perspective. ***Tourism Management***, 8, pp.291-305. ***in*** SYRIOPOULOS, T. C. (1995) (ed.) A dynamic model of demand for Mediterranean tourism. ***International Review of Applied Economics,*** 9(3), pp.318-37.

PEARCE, D.G. (1987) Spatial patterns of package tourism in Europe. ***Annals of Tourism Research,*** 14(2), pp.183-201.

PERRON, P. (1990) Testing for a Unit Root in a Time Series with a Changing Mean, ***Journal of Business Economics Statistics***, 8(2), pp.153-162.

PHILLIPS, P.C.B. and PERRON, P. (1988) Testing for a unit root in time series regression, ***Biometrika***, 75, pp.335-346.

PHILLIPS, P. C. B. and QULIARIS, S. (1990) Asymptotic Properties of Residual based Tests for Cointegration, ***Econometrica***, Vol. 55, pp.407-436.

PLOG, S. C. (1972) Why destinations area rise and fall in popularity. Paper presented at Southern California Chapter of the Travel Research Association, ***in*** KELLY, E. M. (1977) (ed.) ***Domestic and International Tourism. Institute of Certified Travel Agents***, Wellesley, Mass, pp.26-8.

PORTER M. E. (1995) The Competitive Advantage of the Inner City. ***Harvard Business Review.*** May-June 1995, pp.55-71.

PORTER, M. E. (1991) National Competitive Advantage :The Competitive Advantage of Nations, ***in*** PORTER, M. E. (ed.) ***Michael Porter on Competition and Strategy.*** USA: Harvard University, Office of University Publisher.

PORTER, M. (1990) ***The Competitive Advantage of Nations.*** New York: Free Press.

PORTER, M. (1992) ***The Competitive Advantage of Nations.*** 3rd ed. New York: Free Press.

PORTER, M. E. (1980) ***Competitive Strategy: Techniques for Analysing Industries and Competitors.*** New York: Free Press.

PORTER, M. E. and LINDE, C. (1995) Green and Competitive. ***Harvard Business Review.*** Sept-Oct 1995, pp.120-134.

PORTER, M. E. and SPENCE, A. M. (1977) ***Vertical Integration and Differentiated Inputs***, HIER Discussion Paper, no.576, Harvard University.

RAMANATHAN, R., ENGLE, R., GRANGER, C.W.J., VAHID-ARAGHI, F. and BRACE, C. (1997) Short-run forecast of electricity loads and peaks, ***International Journal of Forecasting***, 13, pp.161-174.

RICHARD, S. (1993) Guide to Economic Indicators, ***The Economist***, Buttler & Tanner ltd., London.

RODRIK, D. (1982) ***Comparative Advantage and Structural Change: A Quantitative Analysis***. UNCTAD Discussion Paper, No.8, Geneva, Switzerland.

ROSENWEIG, J. A. (1988) Elasticities of Substitution in Caribbean Tourism. ***Journal of Development Economics***, 29(1), pp. 89-100. ***in*** CROUCH, G. I. (1994) (ed.) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

ROSENWEIG, J. A. (1986) Exchange Rates and Competition for Tourists. ***New England Economic Review***, July/August: pp.57-67. ***in*** CROUCH, G. I. (1994) (ed.) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

ROSENWEIG, J. A. (1985) The Dollar and the US Travel Deficit. ***Federal Reserve Bank of Atlanta Economic Review***, October: pp.4-13. ***in*** CROUCH, G. I. (1994) (ed.) The Study of International Tourism Demand: A Survey of Practice. ***Journal of Travel Research,*** 32(4), pp. 4-41.

RUGMAN, A. (1982) ***New Theories of the Multinational Enterprises: Internalisation and Non-Equity forms of International Involvement.*** Kent: Croom Helm ltd.

RYAN, C. (1993) ***Recreational Tourism: A Social Science Perspective***. London: Routledge, p.5.

SAIKKONEN, P. (1991) Asymptotically Efficient Estimation of Cointegration Regressions, ***Econometric Theory***, 7, pp.1-21.

SARGAN, J.D. (1964) Wages and Prices in the UK : A Study in Econometric Methodology, ***Econometric Analysis of for National Economic Planning***, HART, P.E., MILLS, G. and WHITTAKER, J.N. (eds.) Butter Worths, London.

SESSA, A. (1983) Elements of Tourism Economics, Rome: Catal p.102-3, ***in*** WILLIAMS, A. M. and SHAW, G (1994) (ed.) ***Op cit.***

SHELDON, P. J. (1986) The tour operator industry: an analysis. Annals of Tourism Research, 13(3), pp.349-65, ***in*** SINCLAIR, M. T. (1991) (ed.) ***Op cit,*** p.8.

SINCLAIR, M. T. and STABLER, M. J. (1997) ***Economics of Tourism***. London: Routledge.

SIMMS, J., HALES, C. and RAILEY, M. (1988) Examination of the concept of internal labour markets in UK hotels. ***Tourism Management***, Vol. 9, pp.3-12, ***in*** WILLIAMS, A. M. and SHAW, G. (1994) (ed.), p.149, ***Op cit.***

SMITH, A. (1925) ***The Wealth of Nations***, 4th ed. Methuen, London.

SMITH, S. L. J. (1988) Defining Tourism: A Supply Side View. ***Annals of Tourism Research***, 15, pp.179-90.

STATE PLANNING OFFICE, (1993) ***Prime Ministry***, TRNC.

STATE PLANNING ORGANISATION (1993) Sectoral employment and Population between 1977-1993 , ***Prime Ministry***, TRNC.

STOCK, J.H. (1987)Asymptotic properties of least squares estimators of cointegrating vectors, ***Econometrica***, 55, pp.1035-1056. In Holden, K. and Thompson, J. (1992).

STRONGE, G. B. and REDMAN, M. (1982) US Tourism in Mexico - An Empirical Analysis. ***Annals of Tourism Research***, 9, pp. 21-35.

SYRIOPOULOS, T. C. (1995) A dynamic model of demand for Mediterranean tourism. ***International Review of Applied Economics,*** 9(3), pp.318-37.

SYRIOPOULOS, T. C. (1990) ***Modelling tourism demand for Mediterranean destinations***. Ph.D. Thesis, University of Kent at Canterbury, UK.

SYRIOPOULOS, T. (1989) ***Dynamic modelling of tourism demand in the Mediterranean***. Studies in Economics, No.89/12, University of Kent at Canterbury, 1989.

TAYLOR, C. L. (1971) Statistical Typology of Micro-States and Territories: Towards a Definition of a Micro-States. ***in*** RAPPORT ***et al.,***(ed.***)*** ***Small States and Territories,*** pp.183-202.

THE TIMES, ***Hotel chains join race to Beirut.*** 9 November, 1995. Thursday, p22.

THEIL, H. (1966) ***Applied Economic Forecasting***, North-Holland.

THEIL, H. (1962) ***Economic Forecasting and Policy***, 2nd ed., North-Holland.

TODARO, M. P.(1989) ***Economic Development in the Third World*** , 4th ed. Longman Singapore Publishers ltd.

TOURISM PLANNING OFFICE. (1994) ***Tourism Statistics***. Nicosia.

TSP-7 (Time Series Processor - version 7) (1991) Quantitative Micro Software, 4521 Campus Drive, Suite 336, Irvine, California 92715.

TURKISH TOURIST BULLETIN (1994) Ministry of Tourism Publication, Ankara.

TURNER, L. and ASH, J. (1975) The Golden Hordes: International Tourism and the Pleasure Periphery. London: Constable, 1975, ***in*** BRITTON, R. A. (1978) (ed.) ***International Tourism and Indigenous Development Objectives: A study with Special Reference to the West***. PhD Thesis, University of Minnesota.

UN. (1978) ***Demographic Yearbook.*** (ST/ESA/SAT SER.R/7), United Nation Publications, Sales No. E/F 79. XIII.1.

UNCTAD. (1980) ***Handbook of International Trade and Development Statistics.*** Supplement (TD/STAT.9 and corr. 1), United Nations Publications, Sales No: E/F. 80. II. D. 10.

UNCTC. (1990) Negotiating International Hotel Chain Management Agreements. United Nations, ***Advisory Studies***, No.5, Series B, New York, U.S.A.

UTKULU, U. (1994) ***LDC external debt, trade and solvency of a nation time series evidence for Turkey***, Ph.D. Thesis, Dept. of Economics, University of Leicester, UK.

UYSAL, M. and O'Leary, J. T. (1986) A Canonical Analysis of International Tourism Demand. ***Annals of Tourism Research***, 13(4), pp.651-55.

UYSAL, M. and CROMPTON, J. L. (1985) An Overview of Approaches Used to Forecast Tourism Demand. ***Journal of Travel Research***, 23(4), pp.7-15.

UYSAL, M. and CROMPTON J. L. (1984) Determinants of Demand for International Tourist Flows to Turkey. ***Tourism Management***, 5(4), pp. 288-97.

Van DOORN, J. W. M. (1984) Tourism Forecasting and the Policymaker: Criteria of Usefulness. ***Tourism Management***, 5, pp. 24-39.

VANGREVELINGHE, G. (1966) L'evolution a court terme de la consommation des menages, ***Etudes et Conjoncture*** (INSEE), Vol. 9, pp. 54-102, ***in*** GINSBURGH, V. A. (eds.), ***Op cit.***

VAN DUIJN, J. J (1983) The long wave in Economic life. London: Allen & Unwin, ***in*** WILLIAMS, A. M. and SHAW, G. (1994) (ed.) p.166, ***Op cit.***

VELLAS, F. and BECHEREL, L.(1995) ***International Tourism: An Economic Perspective.*** London: Macmillan Press Ltd.

WALLERSTEIN, I. (1974) The Modern World System, ***in*** SMITH. C. A. (1976) (ed.) ***Regional Analysis: Economic Systems.*** Vol. 1, London: Academic Press.

WHEELWRIGHT, S. C. and MAKRIDAKIS, S. (1973) ***Forecasting Methods for Management.*** New York: Wiley.

WILKINSON, P. E. (1987) Tourism in Small Island Nations: a fragile dependence. ***Leisure Studies***, 6, pp.127-46.

WILLIAMS, A. M. and MONTANARI, A. (1995) Tourism Regions and Spaces in a Changing Social Framework. ***Economies of Social Geography***, 86(1), pp. 3-12.

WILLIAMS, A. M. and SHAW, G. (1995) Tourism and Regional Development: Polarisation and New Forms of Production in the United Kingdom. ***Journal of Economic and Social Geography***, 86(1), pp. 50-63.

WILLIAMS, A. M. and SHAW, G. (1994) ***Critical Issues in Tourism: A Geographical Perspective.*** Oxford: Blackwell.

WILLIAMS, O. and BESSLER, D.A. (1997) Cointegration: implications for the market efficiencies of the high fructose corn syrup and refined sugar markets, ***Applied Economics,*** Vol.29, pp. 225-232.

WILLIAMSON, O. E. (1971) The Vertical Integration of Production: Market Failure Considerations. ***American Economic Review,*** 61, pp.112-123.

WINTERS, P. R. (1960) Forecasting sales by exponentially weighted moving averages. ***Management Science***, 6, pp.324-342. ***in*** WITT, S. F. and MOUTINHO, L. (1994) (eds.) ***Tourism Marketing and Management Handbook.*** 2nd ed., Prentice Hall International (UK) Ltd.

WITT, S. F. (1980a) An Abstract Mode-Abstract (Destination) Node Model of Foreign Holiday Demand. ***Applied Economics***, 12(2), 163-80.

WITT, S. F. (1980b) An Econometric Comparison of UK and German Foreign Holiday Behaviour. ***Managerial and Decision Economics***, 1(3), pp. 123-31.

WITT, S. F. (1977) ***The demand for foreign holidays: an econometric investigation of the factors influencing the generation and distribution of foreign holidays.*** Bradford University, Postgraduate Studies in Management and Administration, Ph.D. Thesis, UK.

WITT, S. F. and MARTIN, C. A. (1989) Demand forecasting in tourism and recreation. ***Progress in Tourism, Recreation and Hospitality Management***, Vol.1, pp.4-32.

WITT, S. F. and MARTIN, C. A. (1987a) Econometric Models for Forecasting International Tourism Demand. ***Journal of Travel Research***, 25(3), pp.23-30.

WITT, S. F. and MARTIN, C. A. (1987b) International tourism demand models - inclusion of marketing variables. ***Tourism Management***, 8(1), pp. 33-40.

WITT, S. F. and MOUTINHO, L. (1994) ***Tourism Marketing and Management Handbook.*** 2nd ed., Prentice Hall International (UK) Ltd.

WITT, S. F. and WITT, C. A. (1995) Forecasting tourism demand: A review of empirical research. ***International Journal of Forecasting***, 11, pp. 447-75.

WITT, S. F. and WITT, C. A. (1992) ***Modelling and Forecasting Demand in Tourism***. London: Academic Press.

WITT, S. F., BROOKE, M. Z. and BUCKLEY, P. J. (1995) ***The Management of International Tourism.*** 2nd ed., Routledge.

WOLFE, R. I. (1983) Recreational travel, the new migration revisited. Ontario Geography, 19, pp.103-24, ***in*** WILLIAMS, A. M. and SHAW, G. (1994) (ed.) p.165, ***Op cit***.

WORLD TOURISM ORGANISATION. (1988) Economic Review of World Tourism in the Context of Economic Crises and the Dominance of the Service Economy. Report for the WTO by V. BOTE GOMEZ, WTO, Madrid, ***in*** SINCLAIR, M. T. (1991) (ed.) ***The Economic of Tourism.*** Vol.3, p.17.

WTO (1998) ***World Tourism Organisation Newsletter***, January, Madrid.

YAMAZAWA, I. (1990) Economic Development and International Trade: The Japanese Model (Honolulu, Hawaii: East-West Centre), ***in*** GORE, C (1994) (ed.) ***Op cit.***

YANG, M. and BEWLEY, R. (1996) On cointegration tests for VAR models with drift, ***Economic Letters***, 51, pp.45-50.

YORUCU, V. and JACKSON, P. M. (1996) ***Tourism and Environmental Planning in Small Island States: The Case of Northern Cyprus and The Isle of Man***. Conference Proceeding Papers, International Conference on Integrating Economic and Environmental Planning in Islands and Small States, Islands and Small States Institute of the Foundation for International Studies, Valetta, Malta 14-16 March.

YORUCU, V. and BASEL, M. (1996) Privatisation of Kyrenia Marina. ***Kibris***, Jan 14, Sunday. Nicosia: Kibris Yayincilik.

YORUCU, V. and BASEL, M. (1995) Tourism Strategies and Alternative Solutions. ***Kibris***, Nov 12, Sunday. Nicosia: Kibris Yayincilik.

ZACHARATOS, G. A. (1986) ***Tourism consumption: the method of calculation and its use for research on the impact of tourism on the national economy***. Athens, Greece: Centre for Planning and Economic Research. ***in*** SYRIOPOULOS, T. C. (1995) (ed.) A dynamic model of demand for Mediterranean tourism. ***International Review of Applied Economics,*** 9(3), pp.318-37.

ZAPATA, H.O. and RAMBALDI, A.N. (1997) Monte Carlo Evidence on Cointegration and Causation, ***Oxford Bulletin of Economics and Statistics***, 59(2), pp.285-298.

APPENDIX:

a1: Number of tourist arrivals per capita from Denmark to Austria.
a2: Number of tourist arrivals per capita from France to Austria.
a3: Number of tourist arrivals per capita from the UK to Austria.
a4: Number of tourist arrivals per capita from Canada to Austria.
a5: Number of tourist arrivals per capita from the Netherlands to Austria.
a6: Number of tourist arrivals per capita from the USA to Austria.
a7: Number of tourist arrivals per capita from Turkey to Austria.
cl1: Cost of living variable from Denmark to Austria.
cl10: Cost of living variable from Germany to Malta.
cl11: Cost of living variable from Italy to Malta.
cl12: Cost of living variable from Libya to Malta.
cl13: Cost of living variable from the UK to Malta.
cl14: Cost of living variable from the USA to Malta.
cl15: Cost of living variable from Turkey to North Cyprus.
cl16: Cost of living variable from the UK to North Cyprus.
cl17: Cost of living variable from Germany to North Cyprus.
cl18: Cost of living variable from the USA to North Cyprus.
cl19: Cost of living variable from Australia to North Cyprus.
cl2: Cost of living variable from France to Austria.
cl20: Cost of living variable from Turkey to North Cyprus.
cl21: Cost of living variable from Germany to Turkey.
cl22: Cost of living variable from Austria to Turkey.
cl23: Cost of living variable from France to Turkey.
cl24: Cost of living variable from the UK to Turkey.
cl25: Cost of living variable from Italy to Turkey.
cl26: Cost of living variable from the USA to Turkey.
cl27: Cost of living variable from North Cyprus to Turkey.
cl28: Cost of living variable from Israel to Turkey.
cl29: Cost of living variable from Denmark to Turkey.
cl3: Cost of living variable from the UK to Austria.
cl30: Cost of living variable from Switzerland to Turkey.
cl31: Cost of living variable from Greece to Turkey.
cl32: Cost of living variable from Belgium to Turkey.
cl33: Cost of living variable from the Netherlands to Turkey.
cl34: Cost of living variable from the USA to the UK.
cl35: Cost of living variable from Germany to the UK.
cl36: Cost of living variable from Austria to the UK.
cl37: Cost of living variable from France to the UK.
cl38: Cost of living variable from Japan to the UK.
cl39: Cost of living variable from Finland to the UK.
cl4: Cost of living variable from Canada to Austria.
cl40: Cost of living variable from Spain to the UK.
cl41: Cost of living variable from the IOM to the UK.
cl42: Cost of living variable from the UK to the IOM.
cl43: Cost of living variable from EIRE to the IOM.
cl5: Cost of living variable from the Netherlands to Austria.

cl6: Cost of living variable from the USA to Austria.
cl7: Cost of living variable from Turkey to Austria.
cl8: Cost of living variable from Austria to Malta.
cl9: Cost of living variable from Denmark to Malta.
d1: Seasonal dummies.
d2: Seasonal dummies.
d3: Seasonal dummies.
d4: Seasonal dummies.
ex1: Exchange rates variable from Denmark to Austria.
ex10: Exchange rates variable from Germany to Malta.
ex11: Exchange rates variable from Italy to Malta.
ex12: Exchange rates variable from Libya to Malta.
ex13: Exchange rates variable from the UK to Malta.
ex14: Exchange rates variable from the USA to Malta.
ex15: Exchange rates variable from Turkey to North Cyprus.
ex16: Exchange rates variable from the UK to North Cyprus.
ex17: Exchange rates variable from Germany to North Cyprus.
ex18: Exchange rates variable from the USA to North Cyprus.
ex19: Exchange rates variable from Australia to North Cyprus.
ex2: Exchange rates variable from France to Austria.
ex20: Exchange rates variable from the IOM to UK.
ex21: Exchange rates variable from Germany to Turkey.
ex22: Exchange rates variable from Austria to Turkey.
ex23: Exchange rates variable from France to Turkey.
ex24: Exchange rates variable from the UK to Turkey.
ex25: Exchange rates variable from Italy to Turkey.
ex26: Exchange rates variable from the USA to Turkey.
ex27: Exchange rates variable from North Cyprus to Turkey.
ex28: Exchange rates variable from Israel to Turkey.
ex29: Exchange rates variable from Denmark to Turkey.
ex3: Exchange rates variable from the UK to Austria.
ex30: Exchange rates variable from Switzerland to Turkey.
ex31: Exchange rates variable from Greece to Turkey.
ex32: Exchange rates variable from Belgium to Turkey.
ex33: Exchange rates variable from the Netherlands to Turkey.
ex34: Exchange rates variable from the USA to the UK.
ex35: Exchange rates variable from Germany to the UK.
ex36: Exchange rates variable from Austria to the UK.
ex37: Exchange rates variable from France to the UK.
ex38: Exchange rates variable from Japan to the UK.
ex39: Exchange rates variable from Finland to the UK.
ex4: Exchange rates variable from Canada to Austria.
ex40: Exchange rates variable from Spain to the UK.
ex43: Exchange rates variable from the IOM to the UK.
ex5: Exchange rates variable from the Netherlands to Austria.
ex6: Exchange rates variable from the USA to Austria.
ex7: Exchange rates variable from Canada to Austria.
ex8: Exchange rates variable from Austria to Malta.
ex9: Exchange rates variable from Denmark to Malta.

ff1: Cost of air fares from Denmark to Austria.
ff10: Cost of air fares from Germany to Malta.
ff11: Cost of air fares from Italy to Malta.
ff12: Cost of air fares from Libya to Malta.
ff13: Cost of air fares from the UK to Malta.
ff14: Cost of air fares from the USA to Malta.
ff2: Cost of air fares from France to Austria.
ff20: Cost of air fares from the IOM to UK.
ff21: Cost of air fares from Germany to Turkey.
ff22: Cost of air fares from Austria to Turkey.
ff23: Cost of air fares from France to Turkey.
ff24: Cost of air fares from the UK to Turkey.
ff25: Cost of air fares from Italy to Turkey.
ff26: Cost of air fares from the USA to Turkey.
ff27: Cost of air fares from North Cyprus to Turkey.
ff28: Cost of air fares from Israel to Turkey.
ff29: Cost of air fares from Denmark to Turkey.
ff3: Cost of air fares from the UK to Austria.
ff30: Cost of air fares from Switzerland to Turkey.
ff31: Cost of air fares from Greece to Turkey.
ff32: Cost of air fares from Belgium to Turkey.
ff33: Cost of air fares from the Netherlands to Turkey.
ff34: Cost of air fares from the USA to the UK.
ff35: Cost of air fares from Germany to UK.
ff36: Cost of air fares from Austria to the UK.
ff37: Cost of air fares from France to the UK.
ff38: Cost of air fares from Japan to the UK.
ff39: Cost of air fares from Finland to the UK.
ff4: Cost of air fares from Canada to Austria.
ff40: Cost of air fares from Spain to the UK.
ff41: Cost of air fares from the IOM to the UK.
ff42: Cost of air fares from the UK to the IOM.
ff43: Cost of air fares from EIRE to the IOM.
ff5: Cost of air fares from the Netherlands to Austria.
ff6: Cost of air fares from the USA to Austria.
ff7: Cost of air fares from Turkey to Austria.
ff8: Cost of air fares from Austria to Malta.
ff9: Cost of air fares from Denmark to Malta.
g1: Seasonally adjusted number of tourist arrivals per capita from the USA to the UK.
g2: Seasonally adjusted number of tourist arrivals per capita from Germany to theUK.
g3: Seasonally adjusted number of tourist arrivals per capita from Austria to the UK.
g4: Seasonally adjusted number of tourist arrivals per capita from France to the UK.
g5: Seasonally adjusted number of tourist arrivals per capita from Japan to the UK.
g6: Seasonally adjusted number of tourist arrivals per capita from Finland to the UK.
g7: Seasonally adjusted number of tourist arrivals per capita from Spain to the UK.
g8: Seasonally adjusted number of tourist arrivals per capita from the IOM to the UK.
i1: Number of tourist arrivals per capita from the UK to the IOM.
i2: Number of tourist arrivals per capita from EIRE to the IOM.
in1: Income per capita variable for Belgium.

in10: Income per capita variable for Spain.
in11: Income per capita variable for Switzerland.
in12: Income per capita variable for Turkey.
in13: Income per capita variable for Australia.
in14: Income per capita variable for Austria.
in15: Income per capita variable for Canada.
in16: Income per capita variable for Finland.
in17: Income per capita variable for Israel.
in18: Income per capita variable for Italy.
in19: Income per capita variable for Japan.
in2: Income per capita variable for Denamark.
in20: Income per capita variable for the USA.
in21: Income per capita variable for the UK.
in22: Income per capita variable for the IOM.
in23: Income per capita variable for North Cyprus.
in3: Income per capita variable for France.
in4: Income per capita variable for Germany.
in5: Income per capita variable for Greece.
in6: Income per capita variable for Ireland.
in7: Income per capita variable for Libya.
in8: Income per capita variable for Malta.
in9: Income per capita variable for the Netherlands.
j1: number of tourist arrivals per capita from the UK to the IOM.
j2: Number of tourist arrivals per capita from EIRE to the IOM.
m1: Number of tourist arrivals per capita from Austria to Malta.
m2: Number of tourist arrivals per capita from Denmark to Malta.
m3: Number of tourist arrivals per capita from Germany to Malta.
m4: Number of tourist arrivals per capita from Italy to Malta.
m5: Number of tourist arrivals per capita from Libya to Malta.
m6: Number of tourist arrivals per capita from the UK to Malta.
m7: Number of tourist arrivals per capita from the USA to Malta.
n1: Number of tourist arrivals per capita from Turkey to North Cyprus(83:1-95:4).
n2: Number of tourist arrivals per capita from the UK to North Cyprus.
n3: Number of tourist arrivals per capita from Germany to North Cyprus.
n4: Number of tourist arrivals per capita from the USA to North Cyprus.
n5: Number of tourist arrivals per capita from Australia to North Cyprus.
n6: Number of tourist arrivals per capita from Turkey to North Cyprus(76:1-95:4).
p1: Seasonally adjusted number of tourist arrivals per capita from Turkey to North Cyprus(83:1-95:4).
p2: Seasonally adjusted number of tourist arrivals per capita from UK to North Cyprus.
p3: Seasonally adjusted number of tourist arrivals per capita from Germany to North Cyprus.
p4: Seasonally adjusted number of tourist arrivals per capita from USA to North Cyprus.
p5: Seasonally adjusted number of tourist arrivals per capita from Australia to North Cyprus.
p6: Seasonally adjusted number of tourist arrivals per capita from Turkey to North Cyprus(76:1-95:4).

s1: Surface travel cost from Denmark to Austria.
s10: Surface travel cost from the UK to Malta.
s11: Surface travel cost from Turkey to North Cyprus.
s12: Surface travel cost from the UK to North Cyprus.
s13: Surface travel cost from Germany to North Cyprus.
s14: Surface travel cost from Germany to Turkey.
s15: Surface travel cost from Germany to the UK.
s16: Surface travel cost from Austria to Turkey.
s17: Surface travel cost from Austria to the UK.
s18: Surface travel cost from France to Turkey.
s19: Surface travel cost from France to the UK.
s2: Surface travel cost from France to Austria.
s20: Surface travel cost from the UK to Turkey.
s21: Surface travel cost from the UK to the IOM.
s22: Surface travel cost from Italy to Turkey.
s23: Surface travel cost from Denmark to Turkey.
s24: Surface travel cost from Switzerland to Turkey.
s25: Surface travel cost from Greece to Turkey.
s26: Surface travel cost from Belgium to Turkey.
s27: Surface travel cost from the Netherlands to Turkey.
s28: Surface travel cost from Finland to the UK.
s29: Surface travel cost from Spain to the UK.
s3: Surface travel cost from the UK to Austria.
s4: Surface travel cost from the Netherlands to Austria.
s5: Surface travel cost from Turkey to Austria.
s6: Surface travel cost from Austria to Malta.
s7: Surface travel cost from Denmark to Malta.
s8: Surface travel cost from Germany to Malta.
s9: Surface travel cost from Italy to Malta.
t1: Number of tourist arrivals per capita from Germany to Turkey.
t10: Number of tourist arrivals per capita from Switzerland to Turkey.
t11: Number of tourist arrivals per capita from Greece to Turkey.
t12: Number of tourist arrivals per capita from Belgium to Turkey.
t13: Number of tourist arrivals per capita from the Netherlands to Turkey.
t2: Number of tourist arrivals per capita from Austria to Turkey.
t3: Number of tourist arrivals per capita from France to Turkey.
t4: Number of tourist arrivals per capita from the UK to Turkey.
t5: Number of tourist arrivals per capita from Italy to Turkey.
t6: Number of tourist arrivals per capita from the USA to Turkey.
t7: Number of tourist arrivals per capita from North Cyprus to Turkey.
t8: Number of tourist arrivals per capita from Israel to Turkey.
t9: Number of tourist arrivals per capita from Denmark to Turkey.
trend: The trend variable.
u1: Number of tourist arrivals per capita from the USA to the UK.
u2: Number of tourist arrivals per capita from Germany to the UK.
u3: Number of tourist arrivals per capita from Austria to the UK.
u4: Number of tourist arrivals per capita from France to the UK.
u5: Number of tourist arrivals per capita from Japan to the UK.
u6: Number of tourist arrivals per capita from Finland to the UK.

u7: Number of tourist arrivals per capita from Spain to the UK.
u8: Number of tourist arrivals per capita from the IOM to the UK.
w1: Seasonally adjusted number of tourist arrivals per capita from Austria to Malta.
w2: Seasonally adjusted number of tourist arrivals per capita from Denmark to Malta.
w3: Seasonally adjusted number of tourist arrivals per capita from Germany to Malta.
w4: Seasonally adjusted number of tourist arrivals per capita from Italy to Malta.
w5: Seasonally adjusted number of tourist arrivals per capita from Libya to Malta.
w6: Seasonally adjusted number of tourist arrivals per capita from the UK to Malta.
w7: Seasonally adjusted number of tourist arrivals per capita from the USA to Malta.
x1: Seasonally adjusted number of tourist arrivals per capita from Germany to Turkey.
x10: Seasonally adjusted number of tourist arrivals per capita from Switzerland to Turkey.
x11: Seasonally adjusted number of tourist arrivals per capita from Greece to Turkey.
x12: Seasonally adjusted number of tourist arrivals per capita from Belgium to Turkey.
x13: Seasonally adjusted number of tourist arrivals per capita from the Netherlands to Turkey.
x2: Seasonally adjusted number of tourist arrivals per capita from Austria to Turkey.
x3: Seasonally adjusted number of tourist arrivals per capita from France to Turkey.
x4: Seasonally adjusted number of tourist arrivals per capita from the UK to Turkey.
x5: Seasonally adjusted number of tourist arrivals per capita from Italy to Turkey.
x6: Seasonally adjusted number of tourist arrivals per capita from the USA to Turkey.
x7: Seasonally adjusted number of tourist arrivals per capita from North Cyprus to Turkey.
x8: Seasonally adjusted number of tourist arrivals per capita from Israel to Turkey.
x9: Seasonally adjusted number of tourist arrivals per capita from Denmark to Turkey.
z1: Seasonally adjusted number of tourist arrivals per capita from Denmark to Austria.
z2: Seasonally adjusted number of tourist arrivals per capita from France to Austria.
z3: Seasonally adjusted number of tourist arrivals per capita from the UK to Austria.
z4: Seasonally adjusted number of tourist arrivals per capita from Canada to Austria.
z5: Seasonally adjusted number of tourist arrivals per capita from the Netherlands to Austria.
z6: Seasonally adjusted number of tourist arrivals per capita from the USA to Austria.
z7: Seasonally adjusted number of tourist arrivals per capita from the Turkey to Austria.

Table 1 Regression Models for the IOM

Origin	Dest	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	ln V_{t-4}/P_{t-4}	Trend	R^2	$\bar{R}^2$	DW
UK	IOM	35.895	-10.187	0.878	0.722	-32.888	1.670	1.973	-4.570	5.030	-0.684	0.176	-0.017	-0.041	0.908	0.867	2.651
		(2.739)	(-2.124)	(0.140)	(1.003)	(-2.300)	(0.766)	(5.427)	(-5.915)	(5.556)	(-1.321)	(0.667)	(-0.116)	(-0.552)			
EIRE	IOM	4.947	0.959	5.624	5.101	5.571		1.493	-4.160	4.657	-0.271	-0.556	0.317	-0.052	0.936	0.906	2.480
		(0.642)	(0.240)	(0.818)	(0.778)	(0.748)		(2.556)	(-2.991)	(2.803)	(-0.631)	(-1.519)	(1.565)	(-0.637)			

Table 2 Best regress. Models for the IOM

Origin	Dest	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	ln V_{t-4}/P_{t-4}	Trend	R^2	$\bar{R}^2$	DW	CO/OLS
UK	IOM	-1.323						1.434	-3.147	3.459	-1.123		0.301		0.895	0.880	2.060	OLS
		(-4.516)						(4.458)	(-4.754)	(4.445)	(-5.162)		(2.403)					
EIRE	IOM	3.881						1.426	-3.837	4.073	-0.372		0.338		0.951	0.937	3.064	CO
		(3.914)						(3.362)	(-3.502)	(3.202)	(-1.636)***		(1.997)*					

Notes :
The figures in brackets are t-values.
* indicates significance at 5% level.
** indicates significance at 10% level.
*** indicates significance at 20% level.

Table 3 Regression Models for Au stria

Origin	Dest	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	ln V_{t-4}/P_{t-4}	Trend	R^2	R^{-2}	DW
Denmark	Austria	-1.407	0.242	-0.334	0.215	0.499	-0.023	-0.105	0.045	-0.245	-0.072	0.023	0.855	-0.004	0.983	0.980	2.156
		(-0.803)	(0.997)	(-1.187)	(0.555)	(0.846)	(-0.378)	(-2.357)	(0.758)	(-2.248)	(-1.242)	(0.422)	(12.576)	(-1.432)			
France	Austria	-12.081	1.797	-1.781	-1.508	-0.731	-0.132	0.307	-1.251	0.868	0.066	0.089	0.501	-0.002	0.976	0.972	1.838
		(-3.656)	(3.956)	(-3.574)	(-2.238)	(-0.674)	(-0.718)	(3.450)	(-4.812)	(4.083)	(0.820)	(1.024)	(4.875)	(-0.747)			
UK	Austria	-1.687	0.082	-1.082	-0.383	5.996	0.152	-0.043	0.012	-0.130	-0.049	-0.179	0.869	-0.003	0.976	0.972	1.814
		(-0.926)	(0.196)	(-3.503)	(-1.826)	(1.929)	(1.080)	(-1.271)	(0.186)	(-1.503)	(-0.740)	(-2.983)	(14.418)	(-2.275)			
Canada	Austria	-7.331	1.097	-0.762	-0.634	2.160		0.279	-0.767	0.814	-0.061	-0.302	0.595	0.000	0.947	0.939	1.353
		(-5.992)	(4.790)	(-2.709)	(-3.992)	(1.099)		(3.630)	(-4.115)	(3.988)	(-0.770)	(-3.532)	(6.668)	(-0.002)			
Nether-	Austria	2.832	0.032	-0.122	1.473	1.967	-0.102	-0.192	0.240	-0.31	-0.61	0.002	0.879	-0.004	0.988	0.986	2.547
lands		(1.466)	(0.158)	(-0.444)	(1.875)	(1.362)	(-1.513)	(-3.921)	(4.165)	(-3.981)	(-1.372)	(0.051)	(19.996)	(-3.221)			
USA	Austria	10,452	-1,800	0.811	0.396	-13.447		0.558	-1.400	1.581	-0.398	-0.396	0.363	0.007	0.917	0.901	1.225
		(1.502)	(-1.486)	(0.673)	(0.922)	(-2.230)		(3.902)	(-4.061)	(3.925)	(-3.468)	(-3.301)	(2.564)	(1.218)			
Turkey	Austria	0.626	-0.160	0.384	0.273	3.877	-0.039	-0.006	-0.014	0.001	-0.479	-0.441	0.774	0.039	0.738	0.688	0.924
		(0.609)	(-0.728)	(1.994)	(1.010)	(1.242)	(-0.241)	(-0.098)	(-0.105)	(0.008)	(-3.616)	(-3.137)	(6.100)	(2.928)			

Table 4 Best Regression Models for Austria

Origin	Dest	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	$\ln V_{t-4}/P_{t-4}$	Trend	R^2	$\bar{R}^2$	DW	CO/OLS
Denmark	Austria	-1.672	0.332	-0.333				-0.095		-0.217			0.838	-0.003	0.982	0.981	2.093	OLS
		(-1.386)***	(1.618)***	(-1.887)**				(-2.542)		(-2.514)			(13.556)	(-2.118)				
France	Austria	-11.655	1.550	-1.835	-1.659			0.306	-1.195	0.843			0.523		0.975	0.972	1.804	OLS
		(-3.931)	(3.964)	(-4.231)	(-3.126)			(3.573)	(-4.691)	(4.067)			(5.198)					
UK	Austria	-0.504	0.193								-0.152		0.963	-0.003	0.968	0.965	1.613	CO
		(-1.076)	(1.539)***								(-2.275)		(43.066)	(-3.246)				
Canada	Austria	-6.088	1.235	-0.384				0.430	-1.154	1.196	-0.176		0.394		0.952	0.947	2.068	CO
		(-2.708)	(2.493)	(-1.007)				(4.688)	(-4.791)	(4.712)	(-1.729)		(3.283)					
Nether-lands	Austria	2.525	0.062		1.108			-0.245	0.271	-0.529	-0.078		0.827	-0.003	0.988	0.986	2.496	CO
		(1.945)	(1.863)***		(1.580)***			(-4.041)	(3.955)	(-3.971)	(-2.005)		(15.488)	(-3.300)				
USA	Austria	0.367				-6.934		0.620	-1.545	1.759	-0.283	-0.383	0.318		0.926	0.917	1.817	CO
		(0.765)				(-2.356)		(5.234)	(-5.319)	(5.235)	(-2.275)	(-2.978)	(2.623)					
Turkey	Austria	-3.347	0.498						-0.365	0.376	-0.301			0.040	0.724	0.701	1.706	CO
		(-6.743)	(3.032)						(-7.436)	(4.388)	(-1.767)**			(2.436)				

Notes :
The figures in brackets are t-values.
* indicates significance at 5% level.
** indicates significance at 10% level.
*** indicates significance at 20% level.

Tables 5 Regression Models for the UK

Origin	Dest	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	ln V_{t-4}/P_{t-4}	Trend	R^2	$\bar{R}^2$	DW
USA	UK	-4.595	1.148	1.093	0.677	0.591		0.401	-1.042	1.248	-0.082	-0.263	0.284	-0.003	0.917	0.902	1.138
		(-1.386)	(1.482)	(0.798)	(2.008)	(0.550)		(5.250)	(-5.764)	(5.572)	(-1.054)	(-3.366)	(2.608)	(-0.565)			
Germany	UK	-0.280	0.185	-0.274	-0.283	-0.805	-0.290	0.326	-0.794	0.890	0.025	-0.072	0.112	0.004	0.936	0.924	2.606
		(-0.242)	(0.813)	(-0.857)	(-1.142)	(-0.513)	(-1.974)	(5.014)	(-5.308)	(5.247)	(0.443)	(-1.457)	(3.202)	(1.168)			
Austria	UK	-16.202	2.332	-2.004	0.738	1.929	0.525	0.276	-0.917	0.788	0.019	0.090	0.210	0.016	0.913	0.895	2.181
		(-2.359)	(2.412)	(-2.558)	(0.788)	(0.703)	(1.525)	(2.897)	(-3.556)	(2.201)	(0.130)	(0.813)	(1.605)	(1.900)			
France	UK	2.008	-0.306	0.354	0.006	1.302	-0.238	0.212	-0.369	0.343	-0.143	-0.063	0.573	0.003	0.900	0.882	2.242
		(0.761)	(-0.581)	(0.752)	(0.027)	(0.612)	(-1.142)	(2.968)	(-2.421)	(2.126)	(-1.327)	(-0.839)	(5.440)	(1.742)			
Japan	UK	-36.772	3.276	-0.495	3.526	6.027		-0.107	-0.077	-0.016	-0.373	-0.161	0.295	0.009	0.946	0.937	1.508
		(-4.434)	(4.380)	(-0.894)	(3.974)	(4.388)		(-2.009)	(-0.902)	(-0.136)	(-4.156)	(-1.875)	(2.793)	(1.103)			
Finland	UK	-3.270	0.941	-0.050	0.046	-0.566	-0.306	0.421	-0.952	1.064	-0.087	-0.149	0.214	0.004	0.796	0.754	2.064
		(-0.830)	(1.790)	(-0.037)	(0.048)	(-0.167)	(-0.922)	(3.667)	(-4.068)	(3.455)	(-0.556)	(-0.885)	(1.705)	(1.086)			
Spain	UK	0.820	0.176	0.434	0.112	0.171	-0.336	-0.010	-0.549	0.676	-0.104	-0.006	0.141	0.015	0.950	0.940	1.986
		(0.352)	(0.632)	(1.330)	(0.473)	(0.095)	(-2.016)	(-0.279)	(-5.116)	(4.980)	(-1.473)	(-0.106)	(1.152)	(3.991)			
IOM	UK	2.319	1.245	1.896	0.036	-2.932		0.413	-0.726	0.952	-0.001	-0.155	0.059	-0.009	0.743	0.643	1.784
		(1.231)	(1.309)	(0.806)	(0.302)	(-0.464)		(3.528)	(-3.563)	(3.462)	(-0.013)	(-1.661)	(0.247)	(-0.518)			

Table 6 Best Re gression Models for the UK

Origin	Dest	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	ln V_{t-4}/P_{t-4}	Trend	R^2	R^{-2}	DW	CO/OLS
USA	UK	-3.293	0.868		0.474			0.351	-0.908	1.081	-0.143	-0.289	0.373		0.930	0.921	1.943	CO
		(-2.315)	(2.664)		(3.542)			(4.669)	(-4.896)	(4.802)	(-1.833)**	(-3.701)	(3.223)					
Germany	UK	-0.540	0.269				-0.269	0.341	-0.827	0.920	-0.069		0.336		0.936	0.928	2.025	CO
		(-2.944)	(5.506)				(-4.550)	(6.363)	(-7.139)	(6.709)	(-1.793)**		(4.001)					
Austria	UK	-7.001	1.143	-1.024				0.292	-0.976	0.983			0.269	0.010	0.906	0.895	2.145	OLS
		(-2.122)	(2.336)	(-1.919)**				(3.752)	(-4.793)	(3.929)			(2.245)	(4.310)				
France	UK	0.231	0.106					0.237	-0.465	0.432	-0.095		0.543	0.004	0.894	0.881	1.990	CO
		(0.846)	(1.612)***					(3.262)	(-3.377)	(2.772)	(-1.323)***		(5.150)	(3.672)				
Japan	UK	-3.111	0.612					-0.090	-0.062		-0.458		0.474		0.931	0.925	1.891	CO
		(-4.544)	(4.594)					(-2.870)	(-2.140)		(-3.603)		(4.529)					
Finland	UK	-3.162	0.983			-1.803		0.456	-1.034	1.156			0.171	0.004	0.781	0.757	1.938	OLS
		(-3.818)	(4.088)			(-2.348)		(4.189)	(-4.776)	(4.182)			(1.431)***	(1.719)**				
Spain	UK	-1.443	0.470				-0.171		-0.684	0.824	-0.096			0.014	0.948	0.944	1.972	OLS
		(-5.348)	(7.430)				(-1.436)***		(-21.830)	(16.314)	(-1.473)***			(11.408)				
IOM	UK	4.047	0.579					0.447	-0.781	1.042	-0.136				0.748	0.706	1.925	CO
		(9.015)	(4.345)					(9.493)	(-8.966)	(8.648)	(-1.738)**							

Notes :
The figures in brackets are t-values.
* indicates significance at 5% level.
** indicates significance at 10% level.
*** indicates significance at 20% level.

Table 7 Regression Models for Tur key

Origin	Dest	C	ln IN	ln CL	ln EX	ln FF	ln S	D2	D3	D4	DM1	DM2	$\ln V_{t-4}/P_{t-4}$	Trend	R^2	$\bar{R}^2$	DW
Germany	Turkey	-1.298	0.134	-0.051	0.365	0.946	-1.324	0.613	-1.340	1.688	-0.545	-0.283	0.578	0.006	0.961	0.954	1.820
		(-0.889)	(0.450)	(-0.163)	(1.223)	(2.102)	(-3.353)	(3.155)	(-3.133)	(3.255)	(-4.175)	(-1.968)	(4.585)	(0.352)			
Austria	Turkey	3.442	-0.656	1.125	2.003	1.516	-1.566	0.969	-2.251	2.812	-0.407	-0.795	0.323	0.050	0.917	0.902	1.636
		(1.558)	(-1.194)	(4.078)	(4.260)	(1.921)	(-4.412)	(6.017)	(-6.608)	(6.503)	(-2.346)	(-4.873)	(3.195)	(2.878)			
France	Turkey	-1.197	0.310	0.669	0.658	0.024	-1.619	1.442	-3.344	4.136	-0.135	-0.956	0.138	0.006	0.904	0.886	1.879
		(-0.596)	(0.794)	(2.479)	(1.968)	(0.058)	(-3.647)	(14.822)	(-18.841)	(12.871)	(-0.719)	(-5.835)	(1.381)	(0.359)			
UK	Turkey	2.318	-1.423	-0.373	-0.448	-0.219	-1.150	0.407	-0.933	1.194	-0.003	-0.754	0.765	0.001	0.956	0.948	1.179
		(1.187)	(-2.732)	(-1.366)	(-1.732)	(-0.371)	(-2.717)	(2.870)	(-3.168)	(3.213)	(-0.027)	(-5.643)	(9.834)	(0.027)			
Italy	Turkey	-9.025	1.691	0.125	0.491	-1.048	-0.296	1.020	-3.042	3.619	-0.193	-0.782	-0.064	0.051	0.949	0.939	1.596
		(-7.264)	(4.191)	(0.767)	(1.980)	(-1.756)	(-1.004)	(11.555)	(-25.733)	(16.285)	(-1.513)	(-6.068)	(-0.619)	(3.812)			
USA	Turkey	-17.128	3.133	0.134	0.001	0.345		1.262	-2.603	3.556	-0.220	-0.770	-0.141	-0.031	0.855	0.830	0.842
		(-2.406)	(2.093)	(0.549)	(0.001)	(0.541)		(11.181)	(-9.534)	(10.680)	(-1.327)	(-4.436)	(-1.278)	(-1.707)			
N. Cyprus	Turkey	-3.593	0.295	-0.039	0.515	-0.087		0.216	-1.226	1.622	-0.046	-0.343	0.223	-0.053	0.957	0.934	1.739
		(-2.420)	(0.918)	(-0.110)	(2.747)	(-0.488)		(1.982)	(-8.382)	(7.814)	(-0.539)	(-4.043)	(1.305)	(-2.544)			
Israel	Turkey	-65.600	-1.120	-6.134	-4.211	-1.804		1.157	-3.680	4.793	0.891	1.732	-0.197	-0.056	0.931	0.900	1.371
		(-2.703)	(-0.411)	(-2.505)	(-1.805)	(-0.745)		(3.442)	(-4.182)	(4.170)	(2.193)	(2.391)	(-0.781)	(-0.546)			

Denmark	Turkey	-4.197	0.867	0.184	-0.222	-0.614	0.031	0.875	-2.120	2.506	-0.488	-0.416	0.406	-0.006	0.915	0.899	1.392
		(-1.335)	(1.699)	(0.390)	(-0.417)	(-0.729)	(0.089)	(4.312)	(-4.754)	(4.482)	(-2.125)	(-1.930)	(3.293)	(-0.209)			
Switzer-land	Turkey	4.593	-0.244	0.654	1.758	1.388	-1.885	0.745	-1.738	2.377	-0.353	-0.774	0.461	0.055	0.882	0.860	1.337
		(1.505)	(-0.358)	(2.387)	(3.448)	(1.897)	(-3.267)	(4.462)	(-4.865)	(5.183)	(-1.849)	(-4.470)	(4.506)	(1.857)			
Greece	Turkey	-3.545	0.049	-0.993	-0.907	0.792	-0.512	0.333	-0.954	1.390	-0.120	-0.292	0.207	-0.007	0.834	0.803	1.003
		(-2.519)	(0.215)	(-3.639)	(-3.123)	(2.836)	(-2.602)	(3.222)	(-4.633)	(4.532)	(-0.722)	(-1.862)	(1.825)	(-0.436)			
Belgium	Turkey	2.983	0.237	1.654	0.832	-0.629	-1.245	1.219	-3.099	3.618	-0.323	-0.569	0.072	-0.023	0.938	0.927	1.753
		(1.346)	(0.606)	(4.514)	(1.674)	(-0.987)	(-4.909)	(6.926)	(-7.219)	(7.078)	(-1.660)	(-3.418)	(0.651)	(-1.011)			
Nether-lands	Turkey	0.308	0.129	0.508	0.883	0.396	-1.208	0.663	-1.581	1.950	-0.185	-0.422	0.533	0.029	0.955	0.946	1.948
		(0.205)	(0.579)	(1.352)	(3.303)	(2.363)	(-5.445)	(3.999)	(-4.333)	(4.272)	(-1.119)	(-2.913)	(5.482)	(1.156)			

Table 8 Best Regres. Models for Tur key

Origin	Dest	C	ln IN	ln CL	ln EX	lnFF	ln S	D2	D3	D4	DM1	DM2	ln V_{t-4}/P_{t-4}	Trend	R^2	R^{-2}	DW	CO/OLS
Germany	Turkey	-3.547	0.664				-0.998	0.700	-1.573	1.925	-0.482		0.513	0.008	0.954	0.949	1.475	OLS
		(-2.943)	(2.641)				(-3.837)	(3.818)	(-3.971)	(3.982)	(-3.870)		(4.516)	(3.481)				
Austria	Turkey	-4.253	0.911				-1.298	0.770	-1.759	2.127	-0.679	-0.422	0.417		0.915	0.904	2.077	CO
		(-4.663)	(4.513)				(-4.101)	(5.351)	(-5.700)	(5.600)	(-3.500)	(-2.148)*	(4.444)					
France	Turkey	-4.185	0.736				-1.442	0.898	-2.040	2.384	-0.969		0.375		0.906	0.897	1.497	OLS
		(-4.829)	(4.124)				(-6.567)	(5.286)	(-5.638)	(5.396)	(-6.571)		(3.956)					
UK	Turkey	-0.855						0.453	-1.019	1.292	-0.682		0.761	0.011	0.962	0.958	1.969	CO
		(-3.786)						(3.909)	(-4.015)	(4.052)	(-4.263)		(10.835)	(3.946)				
Italy	Turkey	-7.894	1.469	-0.159		-0.964		1.037	-3.020	3.503	-0.316	-0.718		0.025	0.953	0.946	2.113	CO
		(-6.022)	(4.295)	(-1.833)**		(-2.189)		(19.619)	(-30.685)	(25.771)	(-2.399)	(-5.317)		(3.678)				
		-7.299	1.295		0.244	-0.853		1.038	-3.020	3.497	-0.318	-0.747		0.036	0.953	0.946	2.096	CO
		(-7.141)	(4.112)		(1.883)**	(-1.946)*		(19.177)	(-30.141)	(25.238)	(-2.470)	(-5.546)		(2.982)				
		-7.101	0.965		0.251		-0.405	1.042	-3.028	3.528	-0.325	-0.765		0.032	0.953	0.946	2.050	CO
		(-7.431)	(5.316)		(1.970)*		(-1.931)*	(19.152)	(-30.079)	(25.448)	(-2.553)	(-5.791)		(2.685)				
		-7.519	1.072		0.251		-0.531	1.031	-3.005	3.493	-0.307	-0.810		0.032	0.949	0.942	1.486	OLS
		(-10.013)	(7.558)		(2.545)		(-3.022)	(16.274)	(-27.383)	(22.488)	(-2.796)	(-7.103)		(3.443)				
USA	Turkey	-9.766	1.775					0.926	-1.985	2.646	-0.515	-0.875	0.311		0.928	0.920	2.234	CO
		(-3.667)	(3.050)					(6.841)	(-6.941)	(6.924)	(-3.625)	(-5.848)	(3.235)					
North Cyprus	Turkey	-4.584	0.418		0.377	-0.366		0.315	-1.222	1.482	-0.233			-0.032	0.933	0.916	1.442	OLS
		(-19.942)	(3.580)		(3.614)	(-2.453)		(5.773)	(-10.939)	(8.126)	(-3.376)			(-2.618)				
Israel	Turkey	-15.387		-1.546		-1.869		0.519	-1.719	2.142	-0.656		0.390		0.896	0.870	1.487	OLS

		(-2.409)		(-1.799)**		(-2.917)		(1.741)**	(-2.354)	(2.301)	(-2.560)		(2.079)*					
Denmark	Turkey	-4.586 (-3.584)	0.688 (2.446)					0.905 (5.347)	-2.157 (-5.690)	2.590 (5.531)	-0.379 (-1.677)**		0.414 (4.139)	0.019 (4.794)	0.924	0.915	1.904	CO
Switzer-land	Turkey	-4.185 (-2.695)	1.031 (2.632)		0.541 (2.619)		-0.851 (-1.656)**	0.848 (4.924)	-2.085 (-6.523)	2.695 (6.071)	-0.746 (-4.245)		0.349 (3.809)	0.057 (2.312)	0.896	0.879	1.633	CO
Greece	Turkey	-1.584 (-2.177)*		-0.451 (-2.566)				0.277 (3.897)	-0.805 (-4.845)	1.129 (4.873)	-0.447 (-2.470)		0.295 (2.547)	0.027 (3.029)	0.869	0.853	1.983	CO
Belgium	Turkey	-5.903 (-4.948)	0.919 (3.619)				-0.454 (-1.627)**	1.105 (5.576)	-2.810 (-6.428)	3.307 (6.170)	-0.337 (-1.773)**	-0.579 (-3.235)	0.207 (1.792)**	0.017 (5.005)	0.929	0.918	1.694	CO
Nether-lands	Turkey	-3.741 (-4.069)	0.615 (3.168)		0.233 (1.264)***		-0.476 (-1.989)*	0.719 (4.999)	-1.721 (-5.359)	2.138 (5.351)	-0.521 (-3.809)		0.535 (6.543)	0.040 (2.139)*	0.956	0.949	1.863	CO
		-2.438 (-2.802)	0.312 (2.856)		0.357 (2.541)			0.754 (2.669)	-1.781 (-2.745)	2.161 (2.690)	-0.501 (-3.590)		0.515 (2.944)	0.053 (3.826)	0.960	0.955	2.192	CO

Notes :
The figures in brackets are t-values.
* indicates significance at 5% level.
** indicates significance at 10% level.
*** indicates significance at 20% level.

VOL 2:

DEVELOPMENT STRATEGIES FOR SMALL ISLAND STATES: THE ROLE OF TOURISM

CONTENTS I

ABBREVIATIONS

Disk 1: ("Data" subdirectory)

All data files are listed in alphabetical order. They are all saved in db format and can be used in TSP, EVIEWS, LOTUS and EXCEL.

aaauscpi: Adjusted quarterly consumer price index for Austria (1976 prices).
aabecpi: Adjusted quarterly consumer price index for Belgium (1976 prices).
aacacpi: Adjusted quarterly consumer price index for for Canada (1976 prices).
aadecpi: Adjusted quarterly consumer price index for Denmark (1976 prices).
aafincpi: Adjusted quarterly consumer price index for Finland (1976 prices).
aafracpi: Adjusted quarterly consumer price index for France (1976 prices).
aagercpi: Adjusted quarterly consumer price index for Germany(1976 prices).
aagrecpi: Adjusted quarterly consumer price index for Greece(1976 prices).
aaiscpi: Adjusted quarterly consumer price index for Israel(1976 prices).
aaitacpi: Adjusted quarterly consumer price index for Italy(1976 prices).
aajacpi: Adjusted quarterly consumer price index for Japan(1976 prices).
aamacpi: Adjusted quarterly consumer price index for Malta(1976 prices).
aanecpi: Adjusted quarterly consumer price index for the Netherlands(1976 prices).
aaspacpi: Adjusted quarterly consumer price index for Spain(1976 prices).
aasttcpi: Adjusted quarterly consumer price index for Australia(1976 prices).
aaswcpi: Adjusted quarterly consumer price index for Switzerland(1976 prices).
aatrcpi: Adjusted quarterly consumer price index for Turkey(1976 prices).
aauscpi: Adjusted quarterly consumer price index for the USA(1976 prices).
ac1:Turkey-Germany return air tariff in US dollars adjusted with origin's CPI.
ac10:Turkey-Germany return air tariff in US dollars adjusted with origin's CPI.
ac11: Netherlands- Turkey return air tariff in US dollars adjusted with origin's CPI.
ac12: Netherlands-Austria return air tariff in US dollars adjusted with origin's CPI.
ac13: Turkey-Austria return air tariff in US dollars adjusted with origin's CPI.
ac14: Belgium -Turkey return air tariff in US dollars adjusted with origin's CPI.
ac15: Germany-UK return air tariff in US dollars adjusted with origin's CPI.
ac16: Germany-Turkey return air tariff in US dollars adjusted with origin's CPI.
ac17: Denmark -Austria return air tariff in US dollars adjusted with origin's CPI.
ac18: Denmark-Turkey return air tariff in US dollars adjusted with origin's CPI.
ac19: Finland-UK return air tariff in US dollars adjusted with origin's CPI.
ac2: Greece- Turkey return air tariff in US dollars adjusted with origin's CPI.
ac20: Denmark - Malta return air tariff in US dollars adjusted with origin's CPI.
ac21: Turkey- Austria return air tariff in US dollars adjusted with origin's CPI.
ac22: UK- Malta return air tariff in US dollars adjusted with origin's CPI.
ac23: UK-Austria return air tariff in US dollars adjusted with origin's CPI.
ac24: UK- Turkey return air tariff in US dollars adjusted with origin's CPI.
ac25: France- Turkey return air tariff in US dollars adjusted with origin's CPI.
ac26: Spain-UK return air tariff in US dollars adjusted with origin's CPI.
ac27: France- Austria return air tariff in US dollars adjusted with origin's CPI.
ac28: Canada-Austria return air tariff in US dollars adjusted with origin's CPI.
ac29: Japan-UK return air tariff in US dollars adjusted with origin's CPI.
ac3: Switzerland-Turkey return air tariff in US dollars adjusted with origin's CPI.
ac30: Italy-Turkey return air tariff in US dollars adjusted with origin's CPI.

ac31: Italy-Malta return air tariff in US dollars adjusted with origin's CPI.
ac32: Austria-Turkey return air tariff in US dollars adjusted with origin's CPI.
ac33: France-UK return air tariff in US dollars adjusted with origin's CPI.
ac34: Austria-UK return air tariff in US dollars adjusted with origin's CPI.
ac35: Austria-Malta return air tariff in US dollars adjusted with origin's CPI.
ac36: Turkey-Netherlands return air tariff in US dollars adjusted with origin's CPI.
ac37: Turkey-Greece return air tariff in US dollars adjusted with origin's CPI.
ac38: Turkey-Denmark return air tariff in US dollars adjusted with origin's CPI.
ac39: Turkey-UK return air tariff in US dollars adjusted with origin's CPI.
ac4: Ireland-the IOM return air tariff in US dollars adjusted with origin's CPI.
ac40: Turkey-France return air tariff in US dollars adjusted with origin's CPI.
ac41: Turkey-Italy return air tariff in US dollars adjusted with origin's CPI.
ac42: Belgium-Turkey return air tariff in US dollars adjusted with origin's CPI.
ac43: UK-Spain return air tariff in US dollars adjusted with origin's CPI.
ac44: UK-USA(New York) return air tariff in US dollars adjusted with origin's CPI.
ac45: UK-Japan return air tariff in US dollars adjusted with origin's CPI.
ac46: UK-USA(Washington) return air tariff in US dollars adjusted with origin's CPI.
ac47: Malta-Denmark return air tariff in US dollars adjusted with origin's CPI.
ac48: Malta-UK return air tariff in US dollars adjusted with origin's CPI.
ac49: Malta-USA return air tariff in US dollars adjusted with origin's CPI.
ac5: Germany-Malta return air tariff in US dollars adjusted with origin's CPI.
ac50: Malta-Italy return air tariff in US dollars adjusted with origin's CPI.
ac51: Malta-Libya return air tariff in US dollars adjusted with origin's CPI.
ac52: Malta-Austria return air tariff in US dollars adjusted with origin's CPI.
ac53: USA-Turkey return air tariff in US dollars adjusted with origin's CPI.
ac54: USA-Malta return air tariff in US dollars adjusted with origin's CPI.
ac55: USA-Austria return air tariff in US dollars adjusted with origin's CPI.
ac56: USA-UK return air tariff in US dollars adjusted with origin's CPI.
ac57: Austria-Netherlands return air tariff in US dollars adjusted with origin's CPI.
ac58: Austria - Denmark return air tariff in US dollars adjusted with origin's CPI.
ac59: Austria-Turkey return air tariff in US dollars adjusted with origin's CPI.
ac6: North Cyprus - Turkey return air tariff in US dollars adjusted with origin's CPI.
ac60: Austria-UK return air tariff in US dollars adjusted with origin's CPI.
ac61: Austria-Canada return air tariff in US dollars adjusted with origin's CPI.
ac62: UK - the IOM return air tariff in US dollars adjusted with origin's CPI.
ac63: The IOM- UK return air tariff in US dollars adjusted with origin's CPI.
ac64: EIRE - the IOM return air tariff in US dollars adjusted with origin's CPI.
ac65: The IOM - EIRE return air tariff in US dollars adjusted with origin's CPI.
ac66: The IOM- Scotland return air tariff in US dollars adjusted with origin's CPI.
ac67: Scotland - the IOM return air tariff in US dollars adjusted with origin's CPI.
ac68: The IOM - N. Ireland return air tariff in US dollars adjusted with origin's CPI.
ac69: North Cyprus - UK return air tariff in US dollars adjusted with origin's CPI.
ac7: UK - Turkey return air tariff in US dollars adjusted with origin's CPI.
ac70: Turkey - North Cyprus return air tariff in US dollars adjusted with origin's CPI.
ac71: N.Cyprus - Turkey (Ist.) return air tariff in USdollars adjusted with origin's CPI.
ac72: Israel-Turkey return air tariff in US dollars adjusted with origin's CPI.
ac8: Malta - Germany return air tariff in US dollars adjusted with origin's CPI.
ac9: Austria- USA return air tariff in US dollars adjusted with origin's CPI.
ad1: Automobile diesel prices per litre(included tax)on quarterly basis for Australia.

ad10: Automobile diesel prices per litre(included tax)on quarterly basis for Ireland.
ad11: Automobile diesel prices per litre(included tax)on quarterly basis for Italy.
ad12: Automobile diesel prices per litre(included tax)on quarterly basis for Japan.
ad13: Automobile diesel prices per litre(included tax)on quarterly basis for the Netherlands.
ad14: Automobile diesel prices per litre(included tax)on quarterly basis for Spain.
ad15:Automobile diesel prices per litre(included tax)on quarterly basis for Switzerland.
ad16: Automobile diesel prices per litre(included tax)on quarterly basis forTurkey.
ad17: Automobile diesel prices per litre(included tax)on quarterly basis for the UK.
ad18: Automobile diesel prices per litre(included tax)on quarterly basis for the USA.
ad2: Automobile diesel prices per litre(included tax)on quarterly basis for Austria.
ad3: Automobile diesel prices per litre(included tax)on quarterly basis for Belgium.
ad4: Automobile diesel prices per litre(included tax)on quarterly basis for Canada.
ad5: Automobile diesel prices per litre(included tax)on quarterly basis for Denmark.
ad6: Automobile diesel prices per litre(included tax)on quarterly basis for Finland.
ad7: Automobile diesel prices per litre(included tax)on quarterly basis for France.
ad8: Automobile diesel prices per litre(included tax)on quarterly basis for Germany.
ad9: Automobile diesel prices per litre(included tax)on quarterly basis for Greece.
asa: Gross Domestic Product for Israel in millons of Israel Shekels only.
aupop: Quarterly estimated population for Austria.
aupopsa: Seasonally adjusted quarterly estimated population for Austria.
aypop: Quarterly estimated population for Australia.
bepop: Quarterly estimated population for Belgium.
capop: Quarterly estimated population for Canada.
depop: Quarterly estimated population for Denmark.
e1: Calculated surface tranportation cost for Denmark to Austria return in US dollars adjusted with origin's currency prices.
e10: Calculated surface tranportation cost for the UK to Malta return in US dollars adjusted with origin's currency prices.
e11: Calculated surface tranportation cost for Turkey to N. Cyprus return in US dollars adjusted with origin's currency prices.
e12: Calculated surface tranportation cost for the UK to N. Cyprus in US dollars adjusted with origin's currency prices.
e13: Calculated surface tranportation cost for Germany to N.Cyprus in US dollars adjusted with origin's currency prices.
e14: Calculated surface tranportation cost for Germany to Turkey in US dollars adjusted with origin's currency prices.
e15: Calculated surface tranportation cost for Germany to the UK in US dollars adjusted with origin's currency prices.
e16: Calculated surface tranportation cost for Austria to Turkey in US dollars adjusted with origin's currency prices.
e17: Calculated surface tranportation cost for Austria to the UK in US dollars adjusted with origin's currency prices.
e18: Calculated surface tranportation cost for France to Turkey in US dollars adjusted with origin's currency prices.
e19: Calculated surface tranportation cost for France to the UK in US dollars adjusted with origin's currency prices.

e2: Calculated surface tranportation cost for France to Austria in US dollars adjusted with origin's currency prices.
e20: Calculated surface tranportation cost for the UK to Turkey in US dollars adjusted with origin's currency prices.
e21: Calculated surface tranportation cost for the UK to the IOM in US dollars adjusted with origin's currency prices.
e22: Calculated surface tranportation cost for Italy to Turkey in US dollars adjusted with origin's currency prices.
e23: Calculated surface tranportation cost for Denmark to Turkey in US dollars adjusted with origin's currency prices.
e24: Calculated surface tranportation cost for Switzerland to Turkey in US dollars adjusted with origin's currency prices.
e25: Calculated surface tranportation cost for Greece to Turkey in US dollars adjusted adjusted with origin's currency prices.
e27: Calculated surface tranportation cost for the Netherlands to Turkey in US dollars adjusted with origin's currency prices.
e28: Calculated surface tranportation cost for Finland to the UK in US dollars adjusted with origin's currency prices.
e29: Calculated surface tranportation cost for Spain to theUK in US dollars adjusted with origin's currency prices.
e3: Calculated surface tranportation cost for the UK to Austria in US dollars adjusted with origin's currency prices.
e4: Calculated surface tranportation cost for the Netherlands to Austria in US dollars adjusted with origin's currency prices.
e5: Calculated surface tranportation cost for Turkey to Austria in US dollars adjusted with origin's currency prices.
e6: Calculated surface tranportation cost for Austria to Malta in US dollars adjusted with origin's currency prices.
e7: Calculated surface tranportation cost for Denmark to Malta in US dollars adjusted with origin's currency prices.
e8: Calculated surface tranportation cost for Germany to Malta in US dollars adjusted with origin's currency prices.
e9: Calculated surface tranportation cost for Italy to Malta in US dollars adjusted with origin's currency prices.
exr1: Quarterly adjusted exchange rates (in real terms) for Austria.
exr10: Quarterly adjusted exchange rates (in real terms) for the USA.
exr11: Quarterly adjusted exchange rates (in real terms) for Canada.
exr12: Quarterly adjusted exchange rates (in real terms) for Finland.
exr13: Quarterly adjusted exchange rates (in real terms) for Greece.
exr14: Quarterly adjusted exchange rates (in real terms) for Japan.
exr15: Quarterly adjusted exchange rates (in real terms) for the Netherlands.
exr16: Quarterly adjusted exchange rates (in real terms) for Switzerland.
exr17: Quarterly adjusted exchange rates (in real terms) for Australia.
exr2: Quarterly adjusted exchange rates (in real terms) for Belgium.
exr3: Quarterly adjusted exchange rates (in real terms) for Denmark.
exr4: Quarterly adjusted exchange rates (in real terms) for France.
exr5: Quarterly adjusted exchange rates (in real terms) for Germany.
exr6: Quarterly adjusted exchange rates (in real terms) for Israel.
exr7: Quarterly adjusted exchange rates (in real terms) for Italy.

exr8: Quarterly adjusted exchange rates (in real terms) for Spain.
exr9: Quarterly adjusted exchange rates (in real terms) for Turkey.
fipop: Quarterly estimated population for Finland.
frpop: Quarterly estimated population for France.
gepop: Quarterly estimated population for the United Germany.
gepop1: Quarterly estimated population for West Germany..
gnp1: Gross Domestic Product for Australia in billions of AUS Dollars.
gnp11: Gross Domestic Product for UK in billions of UK Pounds.
gnp12: Gross Domestic Product for France in billions of French Francs.
gnp2: Gross Domestic Product for Austria in billions of Austrian Shillings.
gnp3: Gross Domestic Product for Canada in billions of Canadian Dollars.
gnp4: Gross Domestic Product for Finland in billions of Finnish Markka.
gnp5: Gross Domestic Product for Germany in billions of Deutch Mark.
gnp6a: Gross Domestic Product for Israel in millons of New Shekels (Israele pounds, then Shekels and lastly New shekels. See ASA.db)
gnp7: Gross Domestic Product for Italy in billions of Italian Lire.
gnp8: Gross Domestic Product forJapan in billions of Japanese Yen.
gnp9: Gross Domestic Product for USA in billions of US Dollars.
grpop: Quarterly estimated population for Greece.
igdp13: Interpolated Gross Domestic Product for France in billions of French Francs.
ignp1: Interpolated Gross Domestic Product for Belgium in billions of Belgian Francs.
ignp10: Interpolated Gross Domestic Product for Spain in billions of Spanish Pesetas.
ignp11a: Interpolated Gross Domestic Product for Switzerland in billions of Kroner.
ignp12a: Interpolated Gross Domestic Product for Turkey in billions of Turkish Lira.
ignp13: Interpolated Gross Domestic Product for N. Cyprus in millions of T. Lira.
ignp14: Interpolated Gross Domestic Product for the IOM in billions of IOM Pounds.
ignp2: Interpolated Gross Domestic Product for Denmark in billions of Danish Kroner
ignp3: Interpolated Gross Domestic Product for France in billions of French Francs.
ignp4: Interpolated Gross Domestic Product for Germany in billions of Deutch Mark.
ignp5: Interpolated Gross Domestic Product for Greece in billions of Greek Drahmas.
ignp6: Interpolated Gross Domestic Product for Ireland in billions of Irish Pounds.
ignp7: Interpolated Gross Domestic Product for Libya in billions of Dinars.
ignp8: Interpolated Gross Domestic Product for Malta in billions of Maltese Lira.
ignp9: Interpolated Gross Domestic Product for the Netherlands in billions of Guilder.
impop1: Quarterly estimated population for the Isle of Man.
impop1sa: Seasonally adjusted quarterly estimated population for the Isle of Man.
inc1: GDP per capita in US dollars for Belgium in real terms.
inc10: GDP per capita in US dollars for Spain in real terms.
inc11: GDP per capita in US dollars for Switzerland in real terms.
inc12: GDP per capita in US dollars for Turkey in real terms.
inc13: GDP per capita in US dollars for Australia in real terms.
inc14: GDP per capita in US dollars for Austria in real terms.
inc15: GDP per capita in US dollars for Canada in real terms.
inc16: GDP per capita in US dollars for Finland in real terms.
inc17: GDP per capita in US dollars for Israel in real terms.
inc18: GDP per capita in US dollars for Italy in real terms.
inc19: GDP per capita in US dollars for Japan in real terms.
inc2: GDP per capita in US dollars for Denmark in real terms.

inc20: GDP per capita in US dollars for the USA in real terms.
inc21: GDP per capita in US dollars for the UK in real terms.
inc22: GDP per capita in US dollars for the IOM in real terms.
inc23: GDP per capita in US dollars for N. Cyprus in real terms.
inc3: GDP per capita in US dollars for France in real terms.
inc4: GDP per capita in US dollars for Germany in real terms.
inc5: GDP per capita in US dollars for Greece in real terms.
inc6: GDP per capita in US dollars for Ireland in real terms.
inc7: GDP per capita in US dollars for Libya in real terms.
inc8: GDP per capita in US dollars for Malta in real terms.
inc9: GDP per capita in US dollars for the Netherlands in real terms.
irexr: Quarterly adjusted exchange rates (in real terms) for Ireland.
irpop: Quarterly estimated population for Ireland.
ispop: Quarterly estimated population for Israel.
itpop: Quarterly estimated population for Italy.
japop: Quarterly estimated population for Japan.
liexr: Quarterly adjusted exchange rates (in real terms) for Libya.
lipop: Quarterly estimated population for Libya.
maexr: Quarterly adjusted exchange rates (in real terms) for Malta.
mapop: Quarterly estimated population for Malta.
mapopsa: Seasonally adjusted quarterly estimated population for Malta.
ncpop: Quarterly estimated population for North Cyprus.
ncpopsa: Seasonally adjusted quarterly estimated population for N. Cyprus.
nepop: Quarterly estimated population for the Netherlands.
qau1: Quarterly arrivals from Denmark to Austria.
qau1sa: Seasonally adjusted quarterly arrivals from Denmark to Austria.
qau2: Quarterly arrivals from France to Austria.
qua2sa: Seasonally adjusted quarterly arrivals from France to Austria.
qau3: Quarterly arrivals from the UK to Austria.
qau3sa: Seasonally adjusted quarterly arrivals from the UK to Austria.
qau4: Quarterly arrivals from Canada to Austria.
qau4sa: Seasonally adjusted quarterly arrivals from Canada to Austria.
qau5: Quarterly arrivals from the Netherlands to Austria.
qau5sa: Seasonally adjusted quarterly arrivals from the Netherlands to Austria.
qau6: Quarterly arrivals from the USA to Austria.
qau6sa: Seasonally adjusted quarterly arrivals from the USA to Austria.
qau7: Quarterly arrivals from Turkey to Austria.
qau7sa: Seasonally adjusted quarterly arrivals from Turkey to Austria.
qim3: Quarterly arrivalsfrom the UK to the IOM.
qim3sa: Seasonally adjusted quarterly arrivals from the UK to the IOM.
qim4: Quarterly arrivals from EIRE to the IOM.
qim4sa: Seasonally adjusted quarterly arrivals from EIRE to the IOM.
qiom4: Quarterly arrivals from EIRE to the IOM.
qiom4sa: Seasonally adjusted quarterly arrivals from EIRE to the IOM.
qma1: Quarterly arrivals from Austria to Malta.
qma1sa: Seasonally adjusted quarterly arrivals from Austria to Malta.
qma2: Quarterly arrivals from Denmark to Malta.
qma2sa: Seasonally adjusted quarterly arrivals from Denmark to Malta.
qma3: Quarterly arrivals from Germany to Malta.

qma3sa: Seasonally adjusted quarterly arrivals from Germany to Malta.
qma4: Quarterly arrivals from Italy to Malta.
qma4sa: Seasonally adjusted quarterly arrivals from Italy to Malta.
qma5: Quarterly arrivals from Libya to Malta.
qma5sa: Seasonally adjusted quarterly arrivals from Libya to Malta.
qma6: Quarterly arrivals from the UK to Malta.
qma6sa: Seasonally adjusted quarterly arrivals from the UK to Malta.
qma7: Quarterly arrivals from the USA to Malta.
qma7sa: Seasonally adjusted quarterly arrivals from the USA to Malta.
qnc1: Quarterly arrivals from Turkey to North Cyprus (1983.1-1995.4).
qnc1sa: Seasonally adjusted arrivals from Turkey to North Cyprus (1983.1-1995.4).
qnc2: Quarterly arrivals from the UK to North Cyprus.
qnc2sa: Seasonally adjusted quarterly arrivals from the UK to North Cyprus.
qnc3: Quarterly arrivals from Germany to North Cyprus.
qnc3sa: Seasonally adjusted quarterly arrivals from Germany to North Cyprus.
qnc4: Quarterly arrivals from the USA to North Cyprus.
qnc4sa: Seasonally adjusted quarterly arrivals from USA to North Cyprus.
qnc5: Quarterly arrivals from Australia to North Cyprus.
qnc5sa: Seasonally adjusted quarterly arrivals from Australia to North Cyprus.
qnc6: Quarterly arrivals from Turkey to North Cyprus (1976.1-1995.4).
qnc6sa: Seasonally adjusted quarterly arrivals from Turkey to North Cyprus (1976.1-1995.4).
qtr1: Quarterly arrivals from Germany to Turkey.
qtr10: Quarterly arrivals from Switzerland to Turkey.
qtr11: Quarterly arrivals from Greece to Turkey.
qtr11sa: Seasonally adjusted quarterly arrivals from Greece to Turkey.
qtr12: Quarterly arrivals from Belgium to Turkey.
qtr12sa: Seasonally adjusted quarterly arrivals from Belgium to Turkey.
qtr13: Quarterly arrivals from the Netherlands to Turkey.
qtr13sa: Seasonally adjusted quarterly arrivals from the Netherlands to Turkey.
qtr1sa: Seasonally adjusted quarterly arrivals from Germany to Turkey.
qtr2: Quarterly arrivals from Austria to Turkey.
qtr2sa: Seasonally adjusted quarterly arrivals from Austria to Turkey.
qtr3: Quarterly arrivals from France to Turkey.
qtr3sa: Seasonally adjusted quarterly arrivals from France to Turkey.
qtr4: Quarterly arrivals from the UK to Turkey.
qtr4sa: Seasonally adjusted quarterly arrivals from the UK to Turkey.
qtr5: Quarterly arrivals from Italy to Turkey.
qtr5sa: Seasonally adjusted quarterly arrivals from Italy to Turkey.
qtr6: Quarterly arrivals from the USA to Turkey.
qtr6sa: Seasonally adjusted quarterly arrivals from the USA to Turkey.
qtr7: Quarterly arrivals from North Cyprus to Turkey.
qtr7sa: Seasonally adjusted quarterly arrivals from North Cyprus to Turkey.
qtr8: Quarterly arrivals from Israel to Turkey.
qtr8sa: Seasonally adjusted quarterly arrivals from Israel to Turkey.
qtr9: Quarterly arrivals from Denmark to Turkey.
qtr9sa: Seasonally adjusted quarterly arrivals from Denmark to Turkey.
quk8: Quarterly arrivals from the IOM to the UK.
quk8sa: Seasonally adjusted quarterly arrivals from the IOM to the UK.

sppop: Quarterly estimated population for Spain.
swpop Quarterly estimated population for Switzerland.
ta1: Ankara - Cologne single way air tariff in origin's currency.
ta10: Ankara - Basel single way air tariff in origin's currency.
ta11: Amsterdam- Ankara single way air tariff in origin's currency.
ta12: Amstaerdam - Vienna single way air tariff in origin's currency.
ta13: Ankara- Vienna single way air tariff in origin's currency.
ta14: Brusells- Ankara single way air tariff in origin's currency.
ta15: Cologne- London single way air tariff in origin's currency.
ta16: Cologne - Ankara single way air tariff in origin's currency.
ta17: Copenhagen- Vienna single way air tariff in origin's currency.
ta18: Copenhagen- Ankara single way air tariff in origin's currency.
ta19: Helsinki London single way air tariff in origin's currency.
ta2: Athens - Ankara single way air tariff in origin's currency.
ta20: Copenhagen - Malta single way air tariff in origin's currency.
ta21: Istanbul - Vienna single way air tariff in origin's currency.
ta22: London- Valetta single way air tariff in origin's currency.
ta23: London- Vienna single way air tariff in origin's currency.
ta24: London-Ankara single way air tariff in origin's currency.
ta25: Paris - Ankara single way air tariff in origin's currency.
ta26: Madrid- London single way air tariff in origin's currency.
ta27: Paris - Vienna single way air tariff in origin's currency.
ta28: Ottawa-Vienna single way air tariff in origin's currency.
ta29: Tokyo-London single way air tariff in origin's currency.
ta3: Basel-Ankara single way air tariff in origin's currency.
ta30: Rome-Ankara single way air tariff in origin's currency.
ta31: Rome-Valetta single way air tariff in origin's currency.
ta32: Vienna-Ankara single way air tariff in origin's currency.
ta33: Paris-London single way air tariff in origin's currency.
ta34: Vienna-London single way air tariff in origin's currency.
ta35: Vienna-Malta single way air tariff in origin's currency.
ta36: Ankara-Amsterdam single way air tariff in origin's currency.
ta37: Ankara-Athens single way air tariff in origin's currency.
ta38: Ankara-Copenhagen single way air tariff in origin's currency.
ta39: Ankara-London single way air tariff in origin's currency.
ta4: Belfast - Ronaldsway(IOM) single way air tariff in origin's currency.
ta40: Ankara-Paris single way air tariff in origin's currency.
ta41: Ankara-Rome single way air tariff in origin's currency.
ta42: Brusells - Istanbul single way air tariff in origin's currency.
ta43: London-Madrid single way air tariff in origin's currency.
ta44: London-New York single way air tariff in origin's currency.
ta45: London-Tokyo single way air tariff in origin's currency.
ta46: London-Washington DC single way air tariff in origin's currency.
ta47: Valetta-Copenhagen single way air tariff in origin's currency.
ta48: Valetta-London single way air tariff in origin's currency.
ta49: Valetta-Mexico City single way air tariff in origin's currency.
ta5: Cologne-Valetta single way air tariff in origin's currency.
ta50: Valetta - Rome single way air tariff in origin's currency.
ta51: Valetta-Tripoli single way air tariff in origin's currency.

ta52: Valetta-Vienna single way air tariff in origin's currency.
ta53: Mexico City-Ankara single way air tariff in origin's currency.
ta54: Mexico City-Valetta single way air tariff in origin's currency.
ta55: Mexico City - Vienna single way air tariff in origin's currency.
ta56: New York-London single way air tariff in origin's currency.
ta57: Vienna-Amsterdam single way air tariff in origin's currency.
ta58: Vienna-Copenhagen single way air tariff in origin's currency.
ta59: Vienna-Istanbul single way air tariff in origin's currency.
ta6: Ercan-Ankara single way air tariff in origin's currency.
ta60: Vienna- London single way air tariff in origin's currency.
ta61: Vienna-Ottawa single way air tariff in origin's currency.
ta62: London-Ronaldsway (IOM) single way air tariff in origin's currency.
ta63: Ronaldsway-London single way air tariff in origin's currency.
ta64: Dublin-Ronaldsway single way air tariff in origin's currency.
ta65: Ronaldsway-Dublin single way air tariff in origin's currency.
ta66: Ronaldsway-Glasgow single way air tariff in origin's currency.
ta67: Glasgow-Ronaldsway single way air tariff in origin's currency.
ta68: Ronaldsway-Belfast single way air tariff in origin's currency.
ta69: Ercan -London single way air tariff in origin's currency.
ta7: London -Izmir single way air tariff in origin's currency.
ta70: Ankara-Ercan RTN air tariff in origin's currency.
ta71: Ercan-Istanbul RTN air tariff in origin's currency.
ta72: Tel Aviv-Istanbul RTN air tariff in origin's currency.
ta73: Tripoli-Valetta single way air tariff in origin's currency.
ta8: Valetta-Cologne single way air tariff in origin's currency.
ta9: Vienna-Washington single way air tariff in origin's currency.
trpop: Quarterly estimated population for Turkey.
trpopsa: Seasonally adjusted quarterly estimated population for Turkey.
uk1: Quarterly arrivals from the USA to the UK.
uk1sa: Seasonally adjusted quarterly arrivals from the USA to the UK.
uk2: Quarterly arrivals from Germany to the UK.
uk2sa: Seasonally adjusted quarterly arrivals from Germany to the UK.
uk3: Quarterly arrivals from Austria to the UK.
uk3sa: Seasonally adjusted quarterly arrivals from Austria to the UK.
uk4: Quarterly arrivals from French to the UK.
uk4sa: Seasonally adjusted quarterly arrivals from French to the UK.
uk5: Quarterly arrivals from Japan to the UK.
uk5sa: Seasonally adjusted quarterly arrivals from Japan to the UK.
uk6: Quarterly arrivals from Finland to the UK.
uk6sa: Seasonally adjusted quarterly arrivals from Finland to the UK.
uk7: Quarterly arrivals from Spain to the UK.
uk7sa: Seasonally adjusted quarterly arrivals from Spain to the UK.
ukexr: Quarterly adjusted exchange rates (in real terms) for the UK.
ukpop: Quarterly estimated population for the UK.
ukpopsa: Seasonally adjusted quarterly estimated population for the UK.
uspop: Quarterly estimated population for the USA.
y15: Annual quarterly totals income per capita in US dollars for Canada.
y17: Annual quarterly totals income per capita in US dollars for Israel.
y18: Annual quarterly totals income per capita in US dollars for Italy.

y19: Annual quarterly totals income per capita in US dollars for Japan.
y20: Annual quarterly totals income per capita in US dollars for the USA.
y21: Annual quarterly totals income per capita in US dollars for the UK.
y22: Annual quarterly totals income per capita in US dollars for the IOM(interpo).
y23: Annual quarterly totals income per capita in US dollars for N. Cyprus (interpo).
y5: Annual quarterly totals income per capita in US dollars for Greece.
y8: Annual quarterly totals income per capita in US dollars for Malta.
ya1: Annual quarterly totals income per capita in US dollars for Belgium.
ya10: Annual quarterly totals income per capita in US dollars for Spain.
ya11: Annual quarterly totals income per capita in US dollars for Switzerland.
ya12: Annual quarterly totals income per capita in US dollars for Turkey.
ya13: Annual quarterly totals income per capita in US dollars for Australia.
ya14: Annual quarterly totals income per capita in US dollars for Austria.
ya16: Annual quarterly totals income per capita in US dollars for Finland.
ya2: Annual quarterly totals income per capita in US dollars for Denmark.
ya3: Annual quarterly totals income per capita in US dollars for France.
ya4: Annual quarterly totals income per capita in US dollars for Germany.
ya7: Annual quarterly totals income per capita in US dollars for Libya.
ya9: Annual quarterly totals income per capita in US dollars for the Netherlands.

DISK 2: ("Adjust" subdirectory)

Disk 2 includes the final form of data series which we used for estimating equations. All series are in logarithmic forms except dummies (d1, d2, d3) and trend.

a1: Number of tourist arrivals per capita from Denmark to Austria.
a2: Number of tourist arrivals per capita from France to Austria.
a3: Number of tourist arrivals per capita from the UK to Austria.
a4: Number of tourist arrivals per capita from Canada to Austria.
a5: Number of tourist arrivals per capita from the Netherlands to Austria.
a6: Number of tourist arrivals per capita from the USA to Austria.
a7: Number of tourist arrivals per capita from Turkey to Austria.
cl1: Cost of living variable from Denmark to Austria.
cl10: Cost of living variable from Germany to Malta.
cl11: Cost of living variable from Italy to Malta.
cl12: Cost of living variable from Libya to Malta.
cl13: Cost of living variable from the UK to Malta.
cl14: Cost of living variable from the USA to Malta.
cl15: Cost of living variable from Turkey to North Cyprus.
cl16: Cost of living variable from the UK to North Cyprus.
cl17: Cost of living variable from Germany to North Cyprus.
cl18: Cost of living variable from the USA to North Cyprus.
cl19: Cost of living variable from Australia to North Cyprus.
cl2: Cost of living variable from France to Austria.
cl20: Cost of living variable from Turkey to North Cyprus.
cl21: Cost of living variable from Germany to Turkey.
cl22: Cost of living variable from Austria to Turkey.
cl23: Cost of living variable from France to Turkey.
cl24: Cost of living variable from the UK to Turkey.
cl25: Cost of living variable from Italy to Turkey.
cl26: Cost of living variable from the USA to Turkey.
cl27: Cost of living variable from North Cyprus to Turkey.
cl28: Cost of living variable from Israel to Turkey.
cl29: Cost of living variable from Denmark to Turkey.
cl3: Cost of living variable from the UK to Austria.
cl30: Cost of living variable from Switzerland to Turkey.
cl31: Cost of living variable from Greece to Turkey.
cl32: Cost of living variable from Belgium to Turkey.
cl33: Cost of living variable from the Netherlands to Turkey.
cl34: Cost of living variable from the USA to the UK.
cl35: Cost of living variable from Germany to the UK.
cl36: Cost of living variable from Austria to the UK.
cl37: Cost of living variable from France to the UK.
cl38: Cost of living variable from Japan to the UK.
cl39: Cost of living variable from Finland to the UK.
cl4: Cost of living variable from Canada to Austria.
cl40: Cost of living variable from Spain to the UK.

cl41: Cost of living variable from the IOM to the UK.
cl42: Cost of living variable from the UK to the IOM.
cl43: Cost of living variable from EIRE to the IOM.
cl5: Cost of living variable from the Netherlands to Austria.
cl6: Cost of living variable from the USA to Austria.
cl7: Cost of living variable from Turkey to Austria.
cl8: Cost of living variable from Austria to Malta.
cl9: Cost of living variable from Denmark to Malta.
d1: Seasonal dummies.
d2: Seasonal dummies.
d3: Seasonal dummies.
d4: Seasonal dummies.
ex1: Exchange rates variable from Denmark to Austria.
ex10: Exchange rates variable from Germany to Malta.
ex11: Exchange rates variable from Italy to Malta.
ex12: Exchange rates variable from Libya to Malta.
ex13: Exchange rates variable from the UK to Malta.
ex14: Exchange rates variable from the USA to Malta.
ex15: Exchange rates variable from Turkey to North Cyprus.
ex16: Exchange rates variable from the UK to North Cyprus.
ex17: Exchange rates variable from Germany to North Cyprus.
ex18: Exchange rates variable from the USA to North Cyprus.
ex19: Exchange rates variable from Australia to North Cyprus.
ex2: Exchange rates variable from France to Austria.
ex20: Exchange rates variable from the IOM to UK.
ex21: Exchange rates variable from Germany to Turkey.
ex22: Exchange rates variable from Austria to Turkey.
ex23: Exchange rates variable from France to Turkey.
ex24: Exchange rates variable from the UK to Turkey.
ex25: Exchange rates variable from Italy to Turkey.
ex26: Exchange rates variable from the USA to Turkey.
ex27: Exchange rates variable from North Cyprus to Turkey.
ex28: Exchange rates variable from Israel to Turkey.
ex29: Exchange rates variable from Denmark to Turkey.
ex3: Exchange rates variable from the UK to Austria.
ex30: Exchange rates variable from Switzerland to Turkey.
ex31: Exchange rates variable from Greece to Turkey.
ex32: Exchange rates variable from Belgium to Turkey.
ex33: Exchange rates variable from the Netherlands to Turkey.
ex34: Exchange rates variable from the USA to the UK.
ex35: Exchange rates variable from Germany to the UK.
ex36: Exchange rates variable from Austria to the UK.
ex37: Exchange rates variable from France to the UK.
ex38: Exchange rates variable from Japan to the UK.
ex39: Exchange rates variable from Finland to the UK.
ex4: Exchange rates variable from Canada to Austria.
ex40: Exchange rates variable from Spain to the UK.
ex43: Exchange rates variable from the IOM to the UK.
ex5: Exchange rates variable from the Netherlands to Austria.

ex6: Exchange rates variable from the USA to Austria.
ex7: Exchange rates variable from Canada to Austria.
ex8: Exchange rates variable from Austria to Malta.
ex9: Exchange rates variable from Denmark to Malta.
ff1: Cost of air fares from Denmark to Austria.
ff10: Cost of air fares from Germany to Malta.
ff11: Cost of air fares from Italy to Malta.
ff12: Cost of air fares from Libya to Malta.
ff13: Cost of air fares from the UK to Malta.
ff14: Cost of air fares from the USA to Malta.
ff2: Cost of air fares from France to Austria.
ff20: Cost of air fares from the IOM to UK.
ff21: Cost of air fares from Germany to Turkey.
ff22: Cost of air fares from Austria to Turkey.
ff23: Cost of air fares from France to Turkey.
ff24: Cost of air fares from the UK to Turkey.
ff25: Cost of air fares from Italy to Turkey.
ff26: Cost of air fares from the USA to Turkey.
ff27: Cost of air fares from North Cyprus to Turkey.
ff28: Cost of air fares from Israel to Turkey.
ff29: Cost of air fares from Denmark to Turkey.
ff3: Cost of air fares from the UK to Austria.
ff30: Cost of air fares from Switzerland to Turkey.
ff31: Cost of air fares from Greece to Turkey.
ff32: Cost of air fares from Belgium to Turkey.
ff33: Cost of air fares from the Netherlands to Turkey.
ff34: Cost of air fares from the USA to the UK.
ff35: Cost of air fares from Germany to UK.
ff36: Cost of air fares from Austria to the UK.
ff37: Cost of air fares from France to the UK.
ff38: Cost of air fares from Japan to the UK.
ff39: Cost of air fares from Finland to the UK.
ff4: Cost of air fares from Canada to Austria.
ff40: Cost of air fares from Spain to the UK.
ff41: Cost of air fares from the IOM to the UK.
ff42: Cost of air fares from the UK to the IOM.
ff43: Cost of air fares from EIRE to the IOM.
ff5: Cost of air fares from the Netherlands to Austria.
ff6: Cost of air fares from the USA to Austria.
ff7: Cost of air fares from Turkey to Austria.
ff8: Cost of air fares from Austria to Malta.
ff9: Cost of air fares from Denmark to Malta.
g1: Seasonally adjusted number of tourist arrivals per capita from the USA to the UK.
g2: Seasonally adjusted number of tourist arrivals per capita from Germany to theUK.
g3: Seasonally adjusted number of tourist arrivals per capita from Austria to the UK.
g4: Seasonally adjusted number of tourist arrivals per capita from France to the UK.
g5: Seasonally adjusted number of tourist arrivals per capita from Japan to the UK.
g6: Seasonally adjusted number of tourist arrivals per capita from Finland to the UK.
g7: Seasonally adjusted number of tourist arrivals per capita from Spain to the UK.

g8: Seasonally adjusted number of tourist arrivals per capita from the IOM to the UK.
i1: Number of tourist arrivals per capita from the UK to the IOM.
i2: Number of tourist arrivals per capita from EIRE to the IOM.
in1: Income per capita variable for Belgium.
in10: Income per capita variable for Spain.
in11: Income per capita variable for Switzerland.
in12: Income per capita variable for Turkey.
in13: Income per capita variable for Australia.
in14: Income per capita variable for Austria.
in15: Income per capita variable for Canada.
in16: Income per capita variable for Finland.
in17: Income per capita variable for Israel.
in18: Income per capita variable for Italy.
in19: Income per capita variable for Japan.
in2: Income per capita variable for Denamark.
in20: Income per capita variable for the USA.
in21: Income per capita variable for the UK.
in22: Income per capita variable for the IOM.
in23: Income per capita variable for North Cyprus.
in3: Income per capita variable for France.
in4: Income per capita variable for Germany.
in5: Income per capita variable for Greece.
in6: Income per capita variable for Ireland.
in7: Income per capita variable for Libya.
in8: Income per capita variable for Malta.
in9: Income per capita variable for the Netherlands.
j1: number of tourist arrivals per capita from the UK to the IOM.
j2: Number of tourist arrivals per capita from EIRE to the IOM.
m1: Number of tourist arrivals per capita from Austria to Malta.
m2: Number of tourist arrivals per capita from Denmark to Malta.
m3: Number of tourist arrivals per capita from Germany to Malta.
m4: Number of tourist arrivals per capita from Italy to Malta.
m5: Number of tourist arrivals per capita from Libya to Malta.
m6: Number of tourist arrivals per capita from the UK to Malta.
m7: Number of tourist arrivals per capita from the USA to Malta.
n1: Number of tourist arrivals per capita from Turkey to North Cyprus(83:1-95:4).
n2: Number of tourist arrivals per capita from the UK to North Cyprus.
n3: Number of tourist arrivals per capita from Germany to North Cyprus.
n4: Number of tourist arrivals per capita from the USA to North Cyprus.
n5: Number of tourist arrivals per capita from Australia to North Cyprus.
n6: Number of tourist arrivals per capita from Turkey to North Cyprus(76:1-95:4).
p1: Seasonally adjusted number of tourist arrivals per capita from Turkey to North Cyprus(83:1-95:4).
p2: Seasonally adjusted number of tourist arrivals per capita from UK to North Cyprus.
p3: Seasonally adjusted number of tourist arrivals per capita from Germany to North Cyprus.
p4: Seasonally adjusted number of tourist arrivals per capita from USA to North Cyprus.

p5: Seasonally adjusted number of tourist arrivals per capita from Australia to North Cyprus.
p6: Seasonally adjusted number of tourist arrivals per capita from Turkey to North Cyprus(76:1-95:4).
s1: Surface travel cost from Denmark to Austria.
s10: Surface travel cost from the UK to Malta.
s11: Surface travel cost from Turkey to North Cyprus.
s12: Surface travel cost from the UK to North Cyprus.
s13: Surface travel cost from Germany to North Cyprus.
s14: Surface travel cost from Germany to Turkey.
s15: Surface travel cost from Germany to the UK.
s16: Surface travel cost from Austria to Turkey.
s17: Surface travel cost from Austria to the UK.
s18: Surface travel cost from France to Turkey.
s19: Surface travel cost from France to the UK.
s2: Surface travel cost from France to Austria.
s20: Surface travel cost from the UK to Turkey.
s21: Surface travel cost from the UK to the IOM.
s22: Surface travel cost from Italy to Turkey.
s23: Surface travel cost from Denmark to Turkey.
s24: Surface travel cost from Switzerland to Turkey.
s25: Surface travel cost from Greece to Turkey.
s26: Surface travel cost from Belgium to Turkey.
s27: Surface travel cost from the Netherlands to Turkey.
s28: Surface travel cost from Finland to the UK.
s29: Surface travel cost from Spain to the UK.
s3: Surface travel cost from the UK to Austria.
s4: Surface travel cost from the Netherlands to Austria.
s5: Surface travel cost from Turkey to Austria.
s6: Surface travel cost from Austria to Malta.
s7: Surface travel cost from Denmark to Malta.
s8: Surface travel cost from Germany to Malta.
s9: Surface travel cost from Italy to Malta.
t1: Number of tourist arrivals per capita from Germany to Turkey.
t10: Number of tourist arrivals per capita from Switzerland to Turkey.
t11: Number of tourist arrivals per capita from Greece to Turkey.
t12: Number of tourist arrivals per capita from Belgium to Turkey.
t13: Number of tourist arrivals per capita from the Netherlands to Turkey.
t2: Number of tourist arrivals per capita from Austria to Turkey.
t3: Number of tourist arrivals per capita from France to Turkey.
t4: Number of tourist arrivals per capita from the UK to Turkey.
t5: Number of tourist arrivals per capita from Italy to Turkey.
t6: Number of tourist arrivals per capita from the USA to Turkey.
t7: Number of tourist arrivals per capita from North Cyprus to Turkey.
t8: Number of tourist arrivals per capita from Israel to Turkey.
t9: Number of tourist arrivals per capita from Denmark to Turkey.
trend: The trend variable.
u1: Number of tourist arrivals per capita from the USA to the UK.
u2: Number of tourist arrivals per capita from Germany to the UK.

u3: Number of tourist arrivals per capita from Austria to the UK.
u4: Number of tourist arrivals per capita from France to the UK.
u5: Number of tourist arrivals per capita from Japan to the UK.
u6: Number of tourist arrivals per capita from Finland to the UK.
u7: Number of tourist arrivals per capita from Spain to the UK.
u8: Number of tourist arrivals per capita from the IOM to the UK.
w1: Seasonally adjusted number of tourist arrivals per capita from Austria to Malta.
w2: Seasonally adjusted number of tourist arrivals per capita from Denmark to Malta.
w3: Seasonally adjusted number of tourist arrivals per capita from Germany to Malta.
w4: Seasonally adjusted number of tourist arrivals per capita from Italy to Malta.
w5: Seasonally adjusted number of tourist arrivals per capita from Libyá to Malta.
w6: Seasonally adjusted number of tourist arrivals per capita from the UK to Malta.
w7: Seasonally adjusted number of tourist arrivals per capita from the USA to Malta.
x1: Seasonally adjusted number of tourist arrivals per capita from Germany to Turkey.
x10: Seasonally adjusted number of tourist arrivals per capita from Switzerland to Turkey.
x11: Seasonally adjusted number of tourist arrivals per capita from Greece to Turkey.
x12: Seasonally adjusted number of tourist arrivals per capita from Belgium to Turkey.
x13: Seasonally adjusted number of tourist arrivals per capita from the Netherlands to Turkey.
x2: Seasonally adjusted number of tourist arrivals per capita from Austria to Turkey.
x3: Seasonally adjusted number of tourist arrivals per capita from France to Turkey.
x4: Seasonally adjusted number of tourist arrivals per capita from the UK to Turkey.
x5: Seasonally adjusted number of tourist arrivals per capita from Italy to Turkey.
x6: Seasonally adjusted number of tourist arrivals per capita from the USA to Turkey.
x7: Seasonally adjusted number of tourist arrivals per capita from North Cyprus to Turkey.
x8: Seasonally adjusted number of tourist arrivals per capita from Israel to Turkey.
x9: Seasonally adjusted number of tourist arrivals per capita from Denmark to Turkey.
z1: Seasonally adjusted number of tourist arrivals per capita from Denmark to Austria.
z2: Seasonally adjusted number of tourist arrivals per capita from France to Austria.
z3: Seasonally adjusted number of tourist arrivals per capita from the UK to Austria.
z4: Seasonally adjusted number of tourist arrivals per capita from Canada to Austria.
z5: Seasonally adjusted number of tourist arrivals per capita from the Netherlands to Austria.
z6: Seasonally adjusted number of tourist arrivals per capita from the USA to Austria.
z7: Seasonally adjusted number of tourist arrivals per capita from the Turkey to Austria.

ANNEX-1

1. REGRESSION RESULTS

You will find the OLS test results first and then econometrically corrected (OLS results without autocorrelation, multicollinearity etc.) results are following thereafter. For each model we use diagnostic tests and most of the equations satisfies the diagnostic tests. The sequence is North Cyprus (6 equations), Malta (7 equations), The Isle of Man (2 equations), Austria (7 equations), United Kingdom (8 equations) and Turkey (13 equations) inbound equations. There are 43 equations in total estimated with Ordinary Least Squares (OLS).

1.1 NORTH CYPRUS INBOUND

1. TURKEY TO NORTH CYPRUS (1983-1995)

LS // Dependent Variable is N1
Date: 01/14/98 Time: 10:38
Sample(adjusted): 1984:1 1995:4
Included observations: 48 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.030464	6.994808	-0.433245	0.6675
IN12	0.857909	1.196401	0.717075	0.4781
CL15	0.084839	0.094735	0.895537	0.3766
EX15	-0.300849	1.574800	-0.191040	0.8496
FF20	31.06562	12.03937	2.580336	0.0142
S11	-0.685628	0.308079	-2.225493	0.0326
D2	0.120016	0.100833	1.190251	0.2420
D3	-0.342048	0.214220	-1.596715	0.1193
D4	0.332591	0.337304	0.986027	0.3309
DM86	-0.447046	0.141522	-3.158845	0.0033
DM91	-0.333362	0.130345	-2.557543	0.0150
TREND	0.082810	0.034982	2.367185	0.0236
N1(-4)	0.154147	0.132500	1.163370	0.2525

R-squared	0.808240	Mean dependent var	-1.542312
Adjusted R-squared	0.742493	S.D. dependent var	0.418230
S.E. of regression	0.212231	Akaike info criterion	-2.874345
Sum squared resid	1.576472	Schwarz criterion	-2.367561
Log likelihood	13.87522	F-statistic	12.29328
Durbin-Watson stat	1.650394	Prob(F-statistic)	0.000000

2. UK TO NORTH CYPRUS

LS // Dependent Variable is N2
Date: 01/13/98 Time: 12:15
Sample(adjusted): 1984:1 1995:4
Included observations: 48 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.501020	3.205100	-2.652342	0.0117
IN21	1.182497	0.963342	1.227494	0.2274
CL16	-0.050054	0.087765	-0.570317	0.5719
EX16	-0.200215	0.047876	-4.181971	0.0002
S12	0.328593	0.665100	0.494051	0.6242
D2	0.709629	0.150839	4.704536	0.0000
D3	-1.710129	0.340998	-5.015074	0.0000

D4	2.248651	0.468142	4.803350	0.0000
DM86	-0.165245	0.124476	-1.327525	0.1925
DM91	-0.475000	0.124794	-3.806276	0.0005
N2(-4)	0.243958	0.136719	1.784372	0.0826

R-squared	0.936187	Mean dependent var	-3.176265
Adjusted R-squared	0.918940	S.D. dependent var	0.739479
S.E. of regression	0.210538	Akaike info criterion	-2.918130
Sum squared resid	1.640068	Schwarz criterion	-2.489313
Log likelihood	12.92607	F-statistic	54.28147
Durbin-Watson stat	1.772386	Prob(F-statistic)	0.000000

3. GERMANY TO NORTH CYPRUS

LS // Dependent Variable is N3
Date: 01/13/98 Time: 12:20
Sample(adjusted): 1984:1 1995:4
Included observations: 48 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.478472	2.007128	-4.722405	0.0000
IN4	1.313561	0.345655	3.800214	0.0005
CL17	0.099151	0.121442	0.816444	0.4195
EX17	-0.111792	0.051956	-2.151669	0.0380
S13	-1.797620	0.596330	-3.014470	0.0046
D2	0.627327	0.185948	3.373672	0.0018
D3	-1.322778	0.387715	-3.411731	0.0016
D4	1.736721	0.568332	3.055822	0.0041
DM89	-0.045327	0.174114	-0.260330	0.7961
DM91	-0.536647	0.168864	-3.177983	0.0030
N3(-4)	0.299485	0.131505	2.277368	0.0286

R-squared	0.904026	Mean dependent var	-3.512029
Adjusted R-squared	0.878087	S.D. dependent var	0.819959
S.E. of regression	0.286297	Akaike info criterion	-2.303402
Sum squared resid	3.032738	Schwarz criterion	-1.874585
Log likelihood	-1.827402	F-statistic	34.85219
Durbin-Watson stat	1.461515	Prob(F-statistic)	0.000000

4. USA TO NORTH CYPRUS

LS // Dependent Variable is N4
Date: 01/14/98 Time: 10:39
Sample(adjusted): 1984:1 1995:4
Included observations: 48 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-20.48601	13.22037	-1.549580	0.1298
IN20	3.638948	2.965936	1.226914	0.2276
CL18	0.272364	0.149125	1.826413	0.0759
EX26	0.334457	0.269216	1.242338	0.2219
D2	0.399613	0.193481	2.065387	0.0459
D3	-0.630288	0.410891	-1.533955	0.1335
D4	0.734040	0.637856	1.150793	0.2572
DM90	-0.483436	0.221958	-2.178050	0.0359
DM91	-0.926999	0.206734	-4.484009	0.0001
TREND	0.020629	0.032723	0.630409	0.5323
N4(-4)	0.256880	0.125787	2.042193	0.0483

R-squared	0.725400	Mean dependent var	-7.162583
Adjusted R-squared	0.651184	S.D. dependent var	0.544262
S.E. of regression	0.321445	Akaike info criterion	-2.071808
Sum squared resid	3.823094	Schwarz criterion	-1.642991
Log likelihood	-7.385666	F-statistic	9.774144

Durbin-Watson stat	1.860238	Prob(F-statistic)	0.000000

5. AUSTRALIA TO NORTH CYPRUS

LS // Dependent Variable is N5
Date: 01/14/98 Time: 10:42
Sample(adjusted): 1984:1 1995:4
Included observations: 48 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.666869	4.863591	-1.781990	0.0830
IN13	0.325121	1.136875	0.285978	0.7765
CL19	-0.100673	0.299421	-0.336225	0.7386
EX19	-0.192009	0.511140	-0.375647	0.7093
D2	0.616255	0.300123	2.053344	0.0472
D3	-1.509342	0.653575	-2.309365	0.0266
D4	1.876805	1.068571	1.756369	0.0873
DM90	-0.293139	0.404476	-0.724738	0.4732
DM91	-1.597991	0.378332	-4.223779	0.0002
TREND	-0.021114	0.055870	-0.377915	0.7077
N5(-4)	-0.037416	0.136718	-0.273670	0.7859

R-squared	0.493510	Mean dependent var	-6.577081
Adjusted R-squared	0.356621	S.D. dependent var	0.769410
S.E. of regression	0.617151	Akaike info criterion	-0.767233
Sum squared resid	14.09238	Schwarz criterion	-0.338416
Log likelihood	-38.69545	F-statistic	3.605176
Durbin-Watson stat	1.864985	Prob(F-statistic)	0.002038

6. TURKEY TO NORTH CYPRUS (1976-1995)

LS // Dependent Variable is N6
Date: 01/14/98 Time: 10:43
Sample(adjusted): 1978:1 1995:4
Included observations: 72 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.120109	3.066406	-0.365284	0.7162
IN12	0.356948	0.540763	0.660083	0.5118
CL20	0.011167	0.044423	0.251381	0.8024
EX15	-0.367726	0.669716	-0.549077	0.5850
FF20	4.321459	4.012995	1.076866	0.2859
S11	-0.384503	0.124545	-3.087261	0.0031
D2	0.136080	0.064301	2.116282	0.0385
D3	-0.353648	0.137289	-2.575941	0.0125
D4	0.361215	0.204507	1.766270	0.0825
DM79	0.026325	0.131970	0.199477	0.8426
DM91	-0.325502	0.104769	-3.106851	0.0029
TREND	0.047604	0.016452	2.893416	0.0053
N6(-4)	0.444546	0.114859	3.870353	0.0003

R-squared	0.900060	Mean dependent var	-0.442562
Adjusted R-squared	0.879733	S.D. dependent var	0.485223
S.E. of regression	0.168273	Akaike info criterion	-3.402354
Sum squared resid	1.670630	Schwarz criterion	-2.991290
Log likelihood	33.32119	F-statistic	44.27948
Durbin-Watson stat	1.506430	Prob(F-statistic)	0.000000

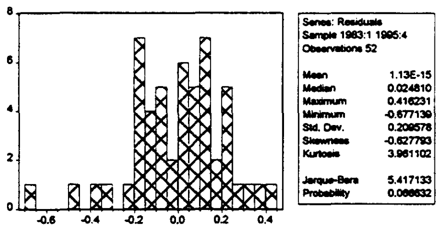
1. TURKEY TO NORTH CYPRUS:

LS // Dependent Variable is N1
Date: 01/13/98 Time: 20:46
Sample(adjusted): 1983:1 1995:4

Included observations: 52 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.465256	0.812950	-5.492660	0.0000
IN12	0.562396	0.243735	2.307404	0.0258
S11	-0.645796	0.218826	-2.951185	0.0051
D2	0.208787	0.088757	2.352338	0.0232
D3	-0.638444	0.154306	-4.137524	0.0002
D4	0.762953	0.220089	3.466571	0.0012
DM86	-0.532418	0.122112	-4.360066	0.0001
DM91	-0.340123	0.119549	-2.845055	0.0067

R-squared	0.751083	Mean dependent var	-1.558268
Adjusted R-squared	0.711483	S.D. dependent var	0.420067
S.E. of regression	0.225634	Akaike info criterion	-2.837047
Sum squared resid	2.240063	Schwarz criterion	-2.536856
Log likelihood	7.978430	F-statistic	18.96658
Durbin-Watson stat	1.602146	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.564168	Probability	0.690019
Obs*R-squared	2.777005	Probability	0.595809

White Heteroskedasticity Test:

F-statistic	1.201129	Probability	0.319876
Obs*R-squared	10.64432	Probability	0.300879

Estimation Command:

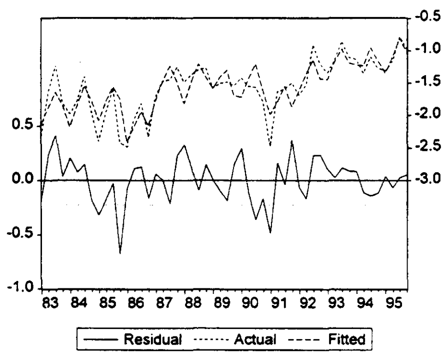
LS N1 C IN12 S11 D2 D3 D4 DM86 DM91

Estimation Equation:

N1 = C(1) + C(2)*IN12 + C(3)*S11 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM86 + C(8)*DM91

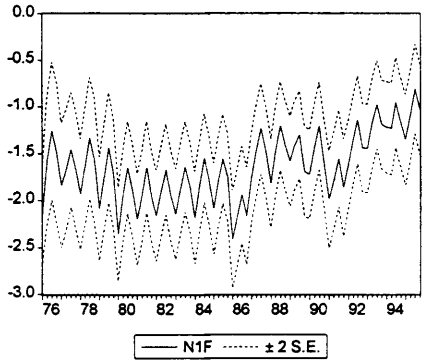
Substituted Coefficients:

N1 = -4.4652562 + 0.56239598*IN12 - 0.64579577*S11 + 0.20878698*D2 - 0.63844416*D3 + 0.76295261*D4 - 0.53241847*DM86 - 0.34012342*DM91



Actual: N1 Forecast: N1F
Sample: 1976:1 1995:4
Include observations: 52

Root Mean Squared Error		0.207553
Mean Absolute Error		0.162362
Mean Absolute Percentage Error		10.48074
Theil Inequality Coefficient		0.064612
Bias Proportion	0.000000	
Variance Proportion	0.071438	
Covariance Proportion	0.928562	

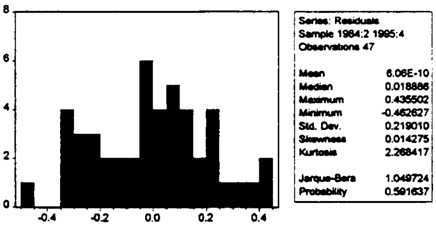


2. UK TO NORTH CYPRUS:
LS // Dependent Variable is N2
Date: 01/13/98 Time: 21:35
Sample(adjusted): 1984:2 1995:4
Included observations: 47 after adjusting endpoints
Convergence achieved after 9 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.669970	2.146144	-2.641934	0.0117
IN21	0.958851	0.514872	1.862307	0.0699
D2	0.503897	0.134665	3.741863	0.0006
D3	-1.184140	0.309958	-3.820330	0.0005
D4	1.524905	0.398340	3.828151	0.0004
N2(-4)	0.439207	0.133636	3.286586	0.0021
AR(1)	0.709826	0.113299	6.265093	0.0000

R-squared	0.900907	Mean dependent var	-3.137245
Adjusted R-squared	0.886043	S.D. dependent var	0.695732
S.E. of regression	0.234862	Akaike info criterion	-2.760914
Sum squared resid	2.206398	Schwarz criterion	-2.485360
Log likelihood	5.191371	F-statistic	60.61036
Durbin-Watson stat	2.177866	Prob(F-statistic)	0.000000

Inverted AR Roots .71



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.388869	Probability	0.815178
Obs*R-squared	1.946650	Probability	0.745571

White Heteroskedasticity Test:

F-statistic	1.167198	Probability	0.343533
Obs*R-squared	8.140873	Probability	0.320336

Estimation Command:

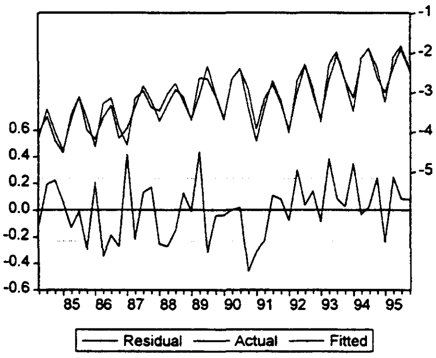
LS N2 C IN21 D2 D3 D4 N2(-4) AR(1)

Estimation Equation:

N2 = C(1) + C(2)*IN21 + C(3)*D2 + C(4)*D3 + C(5)*D4 + C(6)*N2(-4) + [AR(1)=C(7)]

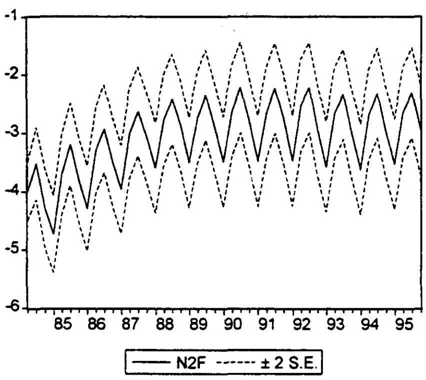
Substituted Coefficients:

N2 = -5.6699703 + 0.9588506*IN21 + 0.5038967*D2 - 1.1841404*D3 + 1.5249054*D4 + 0.43920733*N2(-4) + [AR(1)=0.70982644]



Actual: N2 Forecast: N2F
Sample: 1984:2 1995:4
Include observations: 47

Root Mean Squared Error		0.371681
Mean Absolute Error		0.314719
Mean Absolute Percentage Error		10.85944
Theil Inequality Coefficient		0.058524
Bias Proportion	0.023666	
Variance Proportion	0.049651	
Covariance Proportion	0.926683	

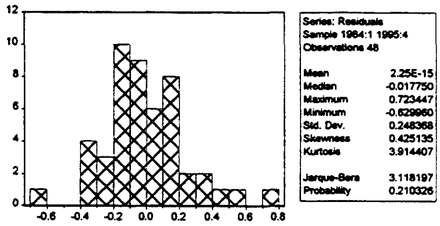


3. GERMANY TO NORTH CYPRUS:
LS // Dependent Variable is N3
Date: 01/13/98 Time: 21:52
Sample(adjusted): 1984:1 1995:4
Included observations: 48 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.72855	2.002226	-5.358312	0.0000

IN4	1.475400	0.345337	4.272354	0.0001
S13	-1.416235	0.558460	-2.535966	0.0154
D2	0.775839	0.175671	4.416433	0.0001
D3	-1.677262	0.349813	-4.794734	0.0000
D4	2.271370	0.478130	4.750524	0.0000
DM91	-0.677026	0.152286	-4.445747	0.0001
DM92	-0.371639	0.167809	-2.214659	0.0329
TREND	0.015827	0.005864	2.698873	0.0103
N3(-4)	0.219782	0.125489	1.751408	0.0879

R-squared	0.908250	Mean dependent var	-3.512029
Adjusted R-squared	0.886520	S.D. dependent var	0.819959
S.E. of regression	0.276218	Akaike info criterion	-2.390075
Sum squared resid	2.899271	Schwarz criterion	-2.000242
Log likelihood	-0.747244	F-statistic	41.79650
Durbin-Watson stat	1.433088	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.733403	Probability	0.575565
Obs*R-squared	3.812608	Probability	0.431960

White Heteroskedasticity Test:

F-statistic	1.068990	Probability	0.415731
Obs*R-squared	13.92679	Probability	0.379020

Estimation Command:

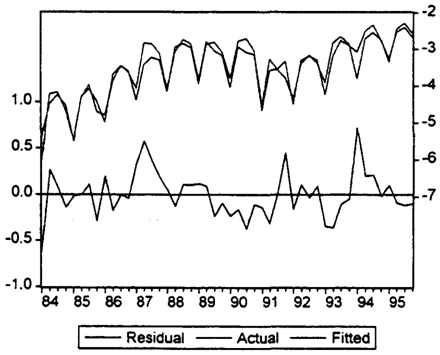
LS N3 C IN4 S13 D2 D3 D4 DM91 DM92 TREND N3(-4)

Estimation Equation:

N3 = C(1) + C(2)*IN4 + C(3)*S13 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM91 + C(8)*DM92 + C(9)*TREND + C(10)*N3(-4)

Substituted Coefficients:

N3 = -10.728552 + 1.4754001*IN4 - 1.4162348*S13 + 0.77583901*D2 - 1.6772621*D3 + 2.2713701*D4 - 0.67702649*DM91 - 0.37163864*DM92 + 0.015826964*TREND + 0.21978154*N3(-4)



Actual: N3 Forecast: N3F

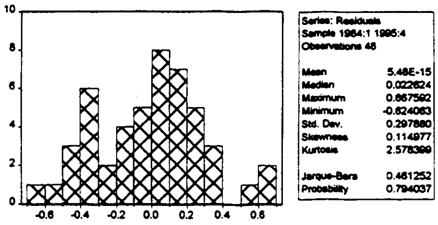
Sample: 1984:1 1995:4
Include observations: 48

Root Mean Squared Error			0.246826
Mean Absolute Error			0.194256
Mean Absolute Percentage Error			5.600115
Theil Inequality Coefficient			0.034290
	Bias Proportion	0.000000	
	Variance Proportion	0.040460	
	Covariance Proportion	0.959540	

4. USA TO NORTH CYPRUS:
LS // Dependent Variable is N4
Date: 01/14/98 Time: 18:28
Sample(adjusted): 1984:1 1995:4
Included observations: 48 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23.37106	11.34243	-2.060498	0.0461
IN20	4.214027	2.634603	1.599492	0.1178
EX26	0.137884	0.102053	1.351102	0.1844
D2	0.544570	0.164226	3.315973	0.0020
D3	-1.062053	0.301768	-3.519432	0.0011
D4	1.524152	0.417193	3.653346	0.0008
DM90	-0.377106	0.175788	-2.145229	0.0382
DM91	-0.975240	0.177157	-5.504949	0.0000
N4(-4)	0.248895	0.107342	2.318718	0.0257

R-squared	0.700453	Mean dependent var	-7.162583
Adjusted R-squared	0.639007	S.D. dependent var	0.544262
S.E. of regression	0.327007	Akaike info criterion	-2.068184
Sum squared resid	4.170422	Schwarz criterion	-1.717334
Log likelihood	-9.472637	F-statistic	11.39955
Durbin-Watson stat	1.915943	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.553240	Probability	0.208441
Obs*R-squared	7.236122	Probability	0.123924

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.553240	Probability	0.208441
Obs*R-squared	7.236122	Probability	0.123924

White Heteroskedasticity Test:

F-statistic	0.892327	Probability	0.556294
Obs*R-squared	10.28359	Probability	0.505073

Estimation Command:

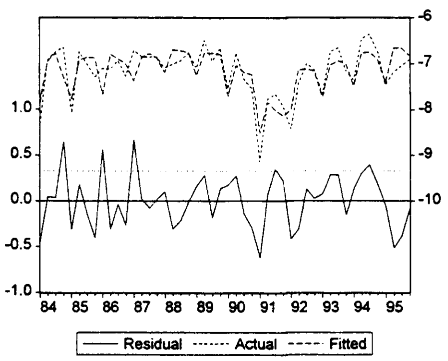
LS N4 C IN20 EX26 D2 D3 D4 DM90 DM91 N4(-4)

Estimation Equation:

N4 = C(1) + C(2)*IN20 + C(3)*EX26 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM90 + C(8)*DM91 + C(9)*N4(-4)

Substituted Coefficients:

N4 = -23.371056 + 4.2140273*IN20 + 0.13788446*EX26 + 0.54456954*D2 - 1.0620531*D3 + 1.5241517*D4 - 0.37710552*DM90 - 0.97523977*DM91 + 0.24889494*N4(-4)



Actual: N4 Forecast: N4F
Sample: 1984:1 1995:4
Include observations: 48

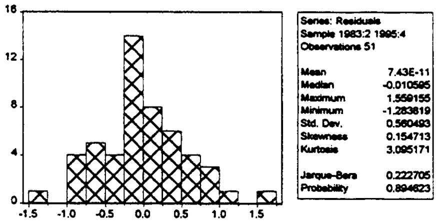
Root Mean Squared Error		0.300891
Mean Absolute Error		0.247234
Mean Absolute Percentage Error		3.439222
Theil Inequality Coefficient		0.020947
Bias Proportion	0.000302	
Variance Proportion	0.104075	
Covariance Proportion	0.895624	

5. AUSTRALIA TO NORTH CYPRUS:
LS // Dependent Variable is N5
Date: 01/14/98 Time: 21:20
Sample(adjusted): 1983:2 1995:4
Included observations: 51 after adjusting endpoints
Convergence achieved after 7 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.835734	0.179397	-38.10398	0.0000
D2	0.497752	0.208685	2.385187	0.0213
D3	-1.197391	0.386762	-3.095940	0.0034
D4	1.353694	0.534892	2.530780	0.0149
DM91	-1.551543	0.376061	-4.125774	0.0002
AR(1)	0.254826	0.146431	1.740248	0.0887

R-squared	0.460467	Mean dependent var	-6.613304
Adjusted R-squared	0.400519	S.D. dependent var	0.763065
S.E. of regression	0.590812	Akaike info criterion	-0.942384
Sum squared resid	15.70765	Schwarz criterion	-0.715110
Log likelihood	-42.33508	F-statistic	7.681087
Durbin-Watson stat	1.956330	Prob(F-statistic)	0.000027

Inverted AR Roots .25



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.866606	Probability	0.492112
Obs*R-squared	3.975757	Probability	0.409297

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.866606	Probability	0.492112
Obs*R-squared	3.975757	Probability	0.409297

White Heteroskedasticity Test:

F-statistic	2.116751	Probability	0.093927
Obs*R-squared	7.928050	Probability	0.094250

Estimation Command:

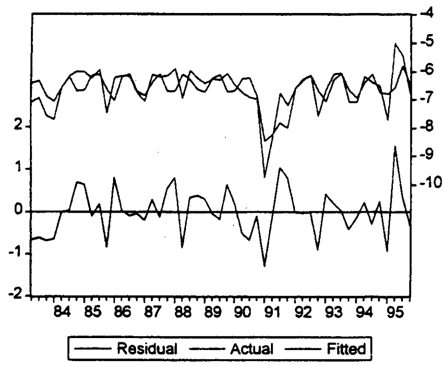
LS N5 C D2 D3 D4 DM91 AR(1)

Estimation Equation:

N5 = C(1) + C(2)*D2 + C(3)*D3 + C(4)*D4 + C(5)*DM91 + [AR(1)=C(6)]

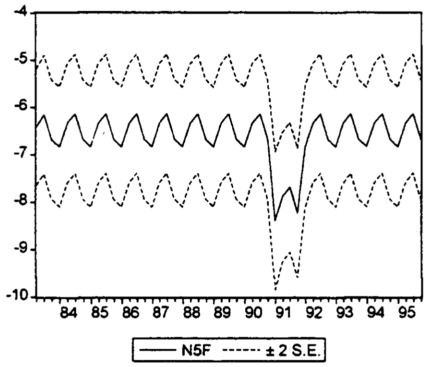
Substituted Coefficients:

N5 = -6.8357342 + 0.49775194*D2 - 1.1973907*D3 + 1.3536937*D4 - 1.5515434*DM91 + [AR(1)=0.25482625]



Actual: N5 Forecast: N5F
Sample: 1983:2 1995:4
Include observations: 51

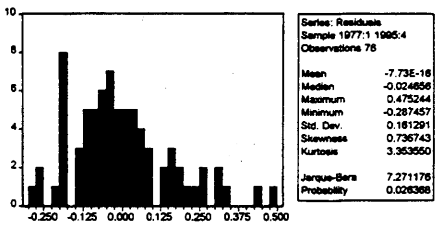
Root Mean Squared Error		0.571302
Mean Absolute Error		0.452028
Mean Absolute Percentage Error		6.765489
Theil Inequality Coefficient		0.042988
Bias Proportion	0.000004	
Variance Proportion	0.200710	
Covariance Proportion	0.799286	



6. TURKEY TO NORTH CYPRUS:
LS // Dependent Variable is N6
Date: 01/14/98 Time: 21:31
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.238879	0.492746	-6.573118	0.0000
IN12	0.672682	0.114197	5.890535	0.0000
S11	-0.457810	0.104196	-4.393735	0.0000
D2	0.131855	0.059259	2.225068	0.0294
D3	-0.393153	0.114439	-3.435495	0.0010
D4	0.415705	0.153307	2.711588	0.0085
DM91	-0.279227	0.098855	-2.824615	0.0062
TREND	0.031040	0.007812	3.973232	0.0002
N6(-4)	0.368185	0.091971	4.003259	0.0002

R-squared	0.884971	Mean dependent var	-0.447998
Adjusted R-squared	0.871236	S.D. dependent var	0.475560
S.E. of regression	0.170649	Akaike info criterion	-3.425493
Sum squared resid	1.951109	Schwarz criterion	-3.149485
Log likelihood	31.32942	F-statistic	64.43242
Durbin-Watson stat	1.445658	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.204673	Probability	0.078540
Obs*R-squared	9.332119	Probability	0.053313

White Heteroskedasticity Test:

F-statistic	1.861840	Probability	0.056948
Obs*R-squared	19.89637	Probability	0.069072

Estimation Command:

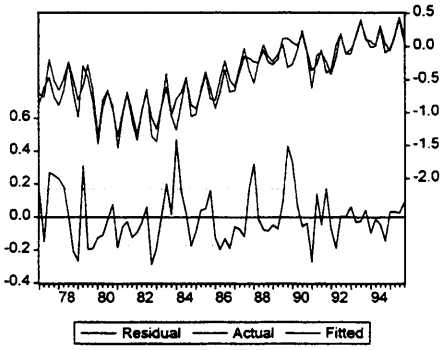
LS N6 C IN12 S11 D2 D3 D4 DM91 TREND N6(-4)

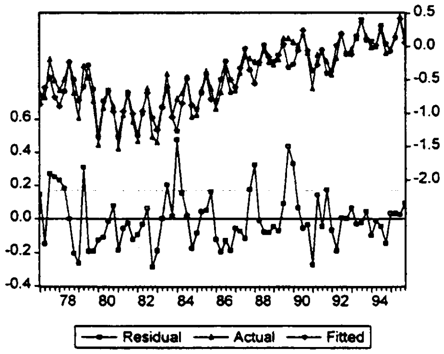
Estimation Equation:

N6 = C(1) + C(2)*IN12 + C(3)*S11 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM91 + C(8)*TREND + C(9)*N6(-4)

Substituted Coefficients:

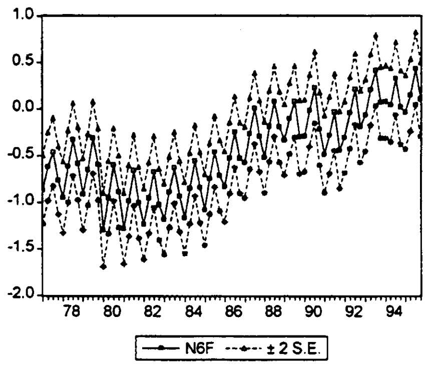
N6 = -3.2388787 + 0.67268192*IN12 - 0.45780982*S11 + 0.13185539*D2 - 0.39315348*D3 + 0.41570506*D4 - 0.27922658*DM91 + 0.031040214*TREND + 0.36818517*N6(-4)

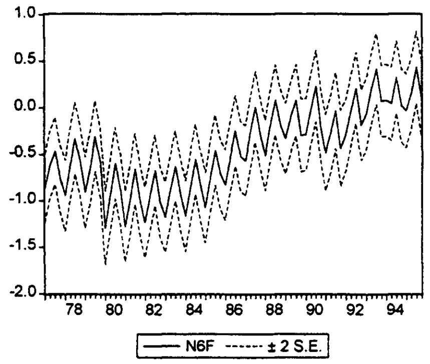




Actual: N6 Forecast: N6F
Sample: 1977:1 1995:4
Include observations: 76

Root Mean Squared Error		0.159656
Mean Absolute Error		0.127786
Mean Absolute Percentage Error		97.62235
Theil Inequality Coefficient		0.125024
Bias Proportion	0.000012	
Variance Proportion	0.047293	
Covariance Proportion	0.952695	





1.2 MALTA INBOUND

1.AUSTRIA TO MALTA

LS // Dependent Variable is M1
Date: 01/12/98 Time: 17:12
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-39.50921	10.62445	-3.718708	0.0004
IN14	7.250067	2.017353	3.593851	0.0006
CL8	-0.674540	1.385837	-0.486738	0.6281
EX8	4.650966	1.703072	2.730928	0.0082
FF8	-7.477592	4.840798	-1.544702	0.1274
S6	0.902266	0.549068	1.643268	0.1053
D2	0.586535	0.168798	3.474779	0.0009
D3	-0.972957	0.353948	-2.748870	0.0078
D4	0.526714	0.553668	0.951319	0.3451
DM87	-0.367663	0.174873	-2.102456	0.0395
DM92	-0.022724	0.177008	-0.128376	0.8983
TREND	-0.017501	0.010417	-1.680044	0.0979
M1(-4)	0.108835	0.121639	0.894743	0.3743

R-squared	0.900839	Mean dependent var	-1.687804
Adjusted R-squared	0.881951	S.D. dependent var	0.874287
S.E. of regression	0.300390	Akaike info criterion	-2.250838
Sum squared resid	5.684765	Schwarz criterion	-1.852160
Log likelihood	-9.307470	F-statistic	47.69398
Durbin-Watson stat	1.811920	Prob(F-statistic)	0.000000

2. DENMARK TO MALTA

LS // Dependent Variable is M2
Date: 01/14/98 Time: 10:26
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.432666	3.904963	-0.110799	0.9121
IN2	0.759419	0.705026	1.077149	0.2855
CL9	0.006828	0.950973	0.007180	0.9943
EX9	0.923913	0.815404	1.133074	0.2615
FF9	-8.021732	3.223129	-2.488803	0.0155
S7	0.972672	0.191738	5.072911	0.0000
D2	0.199746	0.086773	2.301935	0.0247
D3	-0.515575	0.157055	-3.282767	0.0017
D4	0.461293	0.210698	2.189355	0.0323

DM82	-0.296883	0.150317	-1.975046	0.0526
DM91	-0.271249	0.142649	-1.901513	0.0618
TREND	-0.014183	0.006197	-2.288734	0.0255
M2(-4)	0.549119	0.114411	4.799544	0.0000

R-squared	0.841705	Mean dependent var	-0.458282
Adjusted R-squared	0.811553	S.D. dependent var	0.582314
S.E. of regression	0.252785	Akaike info criterion	-2.595924
Sum squared resid	4.025721	Schwarz criterion	-2.197246
Log likelihood	3.805787	F-statistic	27.91590
Durbin-Watson stat	1.172529	Prob(F-statistic)	0.000000

3. GERMANY TO MALTA

LS // Dependent Variable is M3
Date: 01/12/98 Time: 17:23
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.239968	2.390617	-2.610191	0.0113
IN4	0.894851	0.539739	1.657932	0.1023
CL10	-1.647191	0.622824	-2.644714	0.0103
EX10	-0.182088	0.558630	-0.325954	0.7455
FF10	-1.488416	1.484974	-1.002318	0.3200
S8	-0.070197	0.255901	-0.274311	0.7847
D2	0.193800	0.071955	2.693362	0.0091
D3	-0.440218	0.137173	-3.209213	0.0021
D4	0.490408	0.172917	2.836086	0.0061
DM91	-0.171424	0.102782	-1.667843	0.1003
DM95	-0.099946	0.104754	-0.954101	0.3437
TREND	0.018962	0.004285	4.425206	0.0000
M3(-4)	0.461333	0.110684	4.168029	0.0001

R-squared	0.964738	Mean dependent var	-1.534386
Adjusted R-squared	0.958021	S.D. dependent var	0.807310
S.E. of regression	0.165407	Akaike info criterion	-3.444180
Sum squared resid	1.723656	Schwarz criterion	-3.045502
Log likelihood	36.03953	F-statistic	143.6349
Durbin-Watson stat	1.838105	Prob(F-statistic)	0.000000

4. ITALY TO MALTA

LS // Dependent Variable is M4
Date: 01/14/98 Time: 10:28
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.907074	3.676553	1.062700	0.2920
IN18	-0.020021	0.404254	-0.049525	0.9607
CL11	1.188321	0.243141	4.887380	0.0000
EX11	0.176595	0.401406	0.439941	0.6615
FF11	-4.368773	2.515886	-1.736475	0.0874
S9	-0.295424	0.175147	-1.686724	0.0966
D2	0.739322	0.119334	6.195394	0.0000
D3	-2.259450	0.340736	-6.631095	0.0000
D4	2.575633	0.400502	6.431008	0.0000
DM79	-0.114042	0.090887	-1.254768	0.2142
DM91	-0.012030	0.090324	-0.133191	0.8945
TREND	0.037012	0.006453	5.735515	0.0000
M4(-4)	0.106643	0.128388	0.830636	0.4093

R-squared	0.969786	Mean dependent var	-1.820328

Adjusted R-squared	0.964031	S.D. dependent var	0.794458
S.E. of regression	0.150673	Akaike info criterion	-3.630785
Sum squared resid	1.430241	Schwarz criterion	-3.232107
Log likelihood	43.13052	F-statistic	168.5116
Durbin-Watson stat	1.902259	Prob(F-statistic)	0.000000

5. LIBYA TO MALTA

LS // Dependent Variable is M5
Date: 01/14/98 Time: 10:31
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 12 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.070378	4.458155	1.585942	0.1178
IN7	-0.096074	0.347543	-0.276438	0.7831
CL12	-1.737642	0.726364	-2.392247	0.0197
EX12	0.451856	0.643287	0.702417	0.4850
D2	-0.088151	0.090067	-0.978728	0.3315
D3	-0.149485	0.174536	-0.856470	0.3950
D4	0.232604	0.241569	0.962887	0.3393
DM80	-0.160278	0.262850	-0.609770	0.5442
DM86	-0.311487	0.261154	-1.192735	0.2374
TREND	0.017804	0.007333	2.428123	0.0180
M5(-4)	0.450259	0.119169	3.778336	0.0004
AR(1)	0.415827	0.112478	3.696962	0.0005

R-squared	0.658753	Mean dependent var	0.561101
Adjusted R-squared	0.599170	S.D. dependent var	0.522358
S.E. of regression	0.330711	Akaike info criterion	-2.067376
Sum squared resid	6.890284	Schwarz criterion	-1.696578
Log likelihood	-16.89380	F-statistic	11.05609
Durbin-Watson stat	1.952658	Prob(F-statistic)	0.000000

Inverted AR Roots .42

6. UK TO MALTA

LS // Dependent Variable is M6
Date: 01/14/98 Time: 10:32
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.299078	1.892821	-2.799566	0.0068
IN21	1.520752	0.564911	2.692022	0.0091
CL13	0.316360	0.604614	0.523243	0.6026
EX13	1.182980	0.824923	1.434050	0.1565
FF13	0.201427	2.123222	0.094868	0.9247
S10	-0.392879	0.378618	-1.037667	0.3034
D2	0.557804	0.097021	5.749307	0.0000
D3	-1.386793	0.212548	-6.524621	0.0000
D4	1.704269	0.272355	6.257536	0.0000
DM78	-0.165651	0.118672	-1.395871	0.1677
DM82	-0.139789	0.112841	-1.238822	0.2200
TREND	0.005315	0.003499	1.519232	0.1337
M6(-4)	0.224778	0.100906	2.227600	0.0295

R-squared	0.880139	Mean dependent var	0.495484
Adjusted R-squared	0.857309	S.D. dependent var	0.503531
S.E. of regression	0.190206	Akaike info criterion	-3.164785
Sum squared resid	2.279243	Schwarz criterion	-2.766107
Log likelihood	25.42250	F-statistic	38.55092

Durbin-Watson stat	1.548948	Prob(F-statistic)	0.000000

7. USA TO MALTA

LS // Dependent Variable is M7
Date: 01/14/98 Time: 10:34
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.03982	3.502097	-3.437890	0.0010
IN20	2.489506	0.743706	3.347433	0.0014
CL14	-1.443185	0.612143	-2.357593	0.0214
FF14	9.507264	2.081576	4.567340	0.0000
D2	0.226816	0.076873	2.950536	0.0044
D3	-0.489684	0.153986	-3.180061	0.0023
D4	0.603819	0.198997	3.034307	0.0035
DM79	-0.083926	0.124644	-0.673327	0.5031
DM91	-0.097590	0.101183	-0.964491	0.3384
TREND	-0.012342	0.003297	-3.743036	0.0004
M7(-4)	0.647643	0.090964	7.119770	0.0000

R-squared	0.841088	Mean dependent var	-4.775298
Adjusted R-squared	0.816640	S.D. dependent var	0.401613
S.E. of regression	0.171973	Akaike info criterion	-3.387710
Sum squared resid	1.922352	Schwarz criterion	-3.050367
Log likelihood	31.89367	F-statistic	34.40321
Durbin-Watson stat	0.994444	Prob(F-statistic)	0.000000

1. AUSTRIA TO MALTA:
LS // Dependent Variable is M1
Date: 01/12/98 Time: 18:38
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-35.65973	6.284508	-5.674228	0.0000
IN14	6.893674	1.203109	5.729882	0.0000
EX8	4.510262	0.826178	5.459192	0.0000
FF8	-7.321217	2.686034	-2.725661	0.0082
D2	0.360451	0.076590	4.706251	0.0000
D3	-0.542404	0.089705	-6.046510	0.0000
DM87	-0.364370	0.160885	-2.264786	0.0268
TREND	-0.023654	0.006039	-3.916856	0.0002
M1(-4)	0.251963	0.095424	2.640464	0.0103

R-squared	0.891914	Mean dependent var	-1.687804
Adjusted R-squared	0.879009	S.D. dependent var	0.874287
S.E. of regression	0.304111	Akaike info criterion	-2.269926
Sum squared resid	6.196379	Schwarz criterion	-1.993918
Log likelihood	-12.58213	F-statistic	69.10981
Durbin-Watson stat	1.802077	Prob(F-statistic)	0.000000

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.105996	Probability	0.021344
Obs*R-squared	12.51887	Probability	0.013882

White Heteroskedasticity Test:

F-statistic	1.969545	Probability	0.035829
Obs*R-squared	23.65937	Probability	0.050351

Estimation Command:

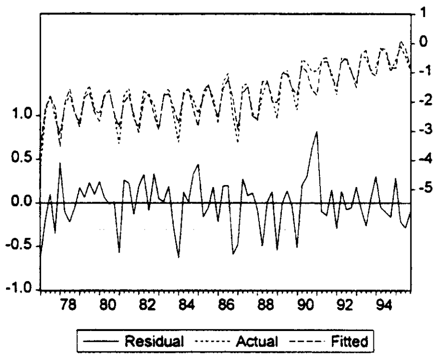
LS M1 C IN14 EX8 FF8 D2 D3 DM87 TREND M1(-4)

Estimation Equation:

M1 = C(1) + C(2)*IN14 + C(3)*EX8 + C(4)*FF8 + C(5)*D2 + C(6)*D3 + C(7)*DM87 + C(8)*TREND + C(9)*M1(-4)

Substituted Coefficients:

M1 = -35.659731 + 6.8936739*IN14 + 4.5102619*EX8 - 7.321217*FF8 + 0.36045135*D2 - 0.54240359*D3 - 0.36437034*DM87 - 0.023653778*TREND + 0.25196312*M1(-4)



Actual: M1 Forecast: M1F
Sample: 1977:1 1995:4
Include observations: 76

Root Mean Squared Error		0.279235
Mean Absolute Error		0.219583
Mean Absolute Percentage Error		19.46162
Theil Inequality Coefficient		0.074037
Bias Proportion	0.000026	
Variance Proportion	0.043863	
Covariance Proportion	0.956111	

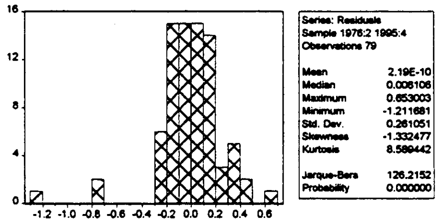
2. DENMARK TO MALTA:
LS // Dependent Variable is M2
Date: 01/12/98 Time: 19:32
Sample(adjusted): 1976:2 1995:4
Included observations: 79 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.261275	0.741484	1.701015	0.0932
FF9	-5.953345	2.259547	-2.634751	0.0103
D2	0.262953	0.058565	4.489955	0.0000
D3	-0.710544	0.111243	-6.387330	0.0000
D4	0.644126	0.151882	4.240978	0.0001
AR(1)	0.821171	0.066855	12.28280	0.0000

R-squared	0.846787	Mean dependent var	-0.525488
Adjusted R-squared	0.836293	S.D. dependent var	0.666926
S.E. of regression	0.269843	Akaike info criterion	-2.546920
Sum squared resid	5.315510	Schwarz criterion	-2.366962
Log likelihood	-5.492793	F-statistic	80.69222

Durbin-Watson stat	1.798462	Prob(F-statistic)	0.000000

Inverted AR Roots .82



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.230795	Probability	0.074552
Obs*R-squared	9.046488	Probability	0.059948

White Heteroskedasticity Test:

F-statistic	7.619640	Probability	0.000008
Obs*R-squared	27.09097	Probability	0.000055

Estimation Command:

LS M2 C FF9 D2 D3 D4 AR(1)

Estimation Equation:

M2 = C(1) + C(2)*FF9 + C(3)*D2 + C(4)*D3 + C(5)*D4 + [AR(1)=C(6)]

Substituted Coefficients:

M2 = 1.2612751 - 5.9533452*FF9 + 0.26295275*D2 - 0.7105437*D3 + 0.64412637*D4 + [AR(1)=0.82117092]
Actual: M2 Forecast: M2F
Sample: 1976:2 1995:4
Include observations: 79

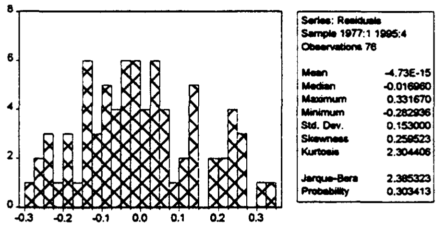
Root Mean Squared Error		0.436994
Mean Absolute Error		0.345371
Mean Absolute Percentage Error		180.4411
Theil Inequality Coefficient		0.285740
Bias Proportion	0.000009	
Variance Proportion	0.269944	
Covariance Proportion	0.730047	

3. GERMANY TO MALTA:
LS // Dependent Variable is M3
Date: 01/13/98 Time: 17:57
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.699117	2.006740	-3.338309	0.0014
IN4	1.076691	0.328492	3.277679	0.0017
CL10	-1.649072	0.368735	-4.472240	0.0000
FF10	-2.237266	1.190414	-1.879401	0.0646
D2	0.186877	0.069779	2.678133	0.0093
D3	-0.438115	0.135165	-3.241336	0.0019
D4	0.477632	0.167569	2.850362	0.0058
DM91	-0.183844	0.093391	-1.968536	0.0532
TREND	0.018225	0.003258	5.594107	0.0000
M3(-4)	0.472187	0.104868	4.502665	0.0000

R-squared	0.964083	Mean dependent var	-1.534386

Adjusted R-squared	0.959185	S.D. dependent var	0.807310
S.E. of regression	0.163098	Akaike info criterion	-3.504726
Sum squared resid	1.755667	Schwarz criterion	-3.198051
Log likelihood	35.34028	F-statistic	196.8410
Durbin-Watson stat	1.843039	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.742521	Probability	0.152023
Obs*R-squared	7.680523	Probability	0.104007

White Heteroskedasticity Test:

F-statistic	1.183415	Probability	0.310873
Obs*R-squared	16.23294	Probability	0.299357

Estimation Command:

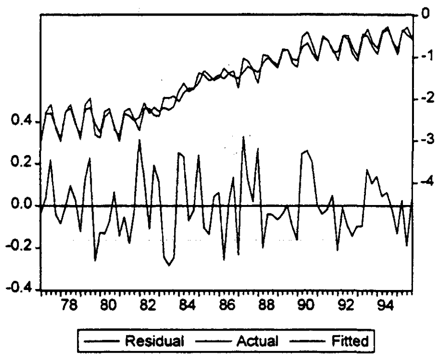
LS M3 C IN4 CL10 FF10 D2 D3 D4 DM91 TREND M3(-4)

Estimation Equation:

M3 = C(1) + C(2)*IN4 + C(3)*CL10 + C(4)*FF10 + C(5)*D2 + C(6)*D3 + C(7)*D4 + C(8)*DM91 + C(9)*TREND + C(10)*M3(-4)

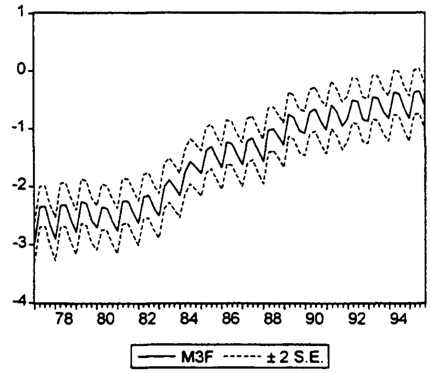
Substituted Coefficients:

M3 = -6.6991168 + 1.0766909*IN4 - 1.6490717*CL10 - 2.2372655*FF10 + 0.18687666*D2 - 0.43811546*D3 + 0.4776322*D4 - 0.18384387*DM91 + 0.018225098*TREND + 0.47218717*M3(-4)



Actual: M3 Forecast: M3F
Sample: 1977:1 1995:4
Include observations: 76

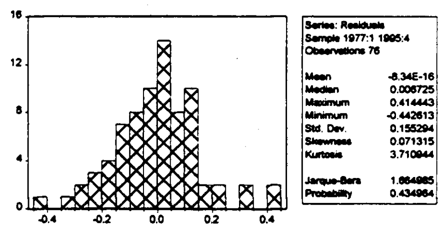
Root Mean Squared Error		0.162021
Mean Absolute Error		0.131226
Mean Absolute Percentage Error		11.30702
Theil Inequality Coefficient		0.046908
Bias Proportion	0.000157	
Variance Proportion	0.019796	
Covariance Proportion	0.980048	



4. ITALY TO MALTA:
LS // Dependent Variable is M4
Date: 01/13/98 Time: 18:13
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.154992	0.789882	-3.994255	0.0002
IN18	0.195321	0.120112	1.626159	0.1086
S9	-0.274543	0.158281	-1.734522	0.0874
D2	0.499320	0.105744	4.721988	0.0000
D3	-1.508790	0.290202	-5.199097	0.0000
D4	1.742856	0.344966	5.052259	0.0000
DM86	-0.298945	0.092368	-3.236459	0.0019
TREND	0.010852	0.002046	5.304751	0.0000
M4(-4)	0.412770	0.106033	3.892857	0.0002

R-squared	0.961791	Mean dependent var	-1.820328
Adjusted R-squared	0.957229	S.D. dependent var	0.794458
S.E. of regression	0.164304	Akaike info criterion	-3.501278
Sum squared resid	1.808710	Schwarz criterion	-3.225270
Log likelihood	34.20922	F-statistic	210.8144
Durbin-Watson stat	1.912672	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.956530	Probability	0.112067
Obs*R-squared	8.397820	Probability	0.078046

White Heteroskedasticity Test:

F-statistic	2.114227	Probability	0.028284
Obs*R-squared	21.81916	Probability	0.039597

Estimation Command:

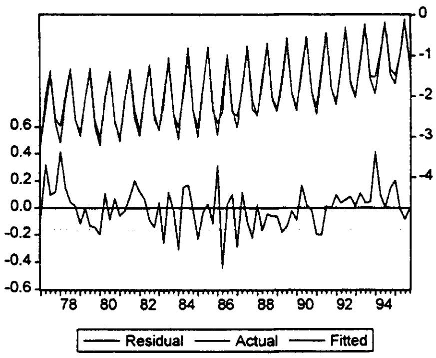
LS M4 C IN18 S9 D2 D3 D4 DM86 TREND M4(-4)

Estimation Equation:

M4 = C(1) + C(2)*IN18 + C(3)*S9 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM86 + C(8)*TREND + C(9)*M4(-4)

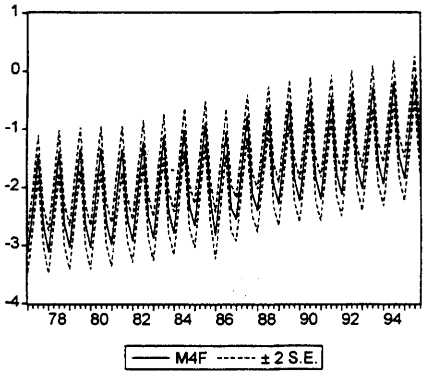
Substituted Coefficients:

M4 = -3.154992 + 0.19532076*IN18 - 0.27454264*S9 + 0.49932023*D2 - 1.5087904*D3 + 1.7428565*D4 - 0.29894479*DM86 + 0.010851922*TREND + 0.41277041*M4(-4)



Actual: M4 Forecast: M4F
Sample: 1977:1 1995:4
Include observations: 76

Root Mean Squared Error		0.160585
Mean Absolute Error		0.124442
Mean Absolute Percentage Error		8.429608
Theil Inequality Coefficient		0.040584
Bias Proportion	0.000590	
Variance Proportion	0.014524	
Covariance Proportion	0.984886	



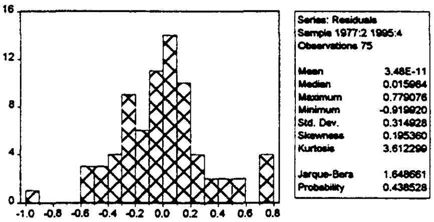
5. LIBYA TO MALTA:
LS // Dependent Variable is M5
Date: 01/13/98 Time: 18:47
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.913701	2.284557	3.026277	0.0035
CL12	-1.892360	0.637171	-2.969943	0.0041
D2	-0.163785	0.050945	-3.214930	0.0020
TREND	0.019069	0.005897	3.233568	0.0019
M5(-4)	0.404928	0.102830	3.937844	0.0002
AR(1)	0.396649	0.105455	3.761307	0.0004

R-squared	0.636515	Mean dependent var	0.561101
Adjusted R-squared	0.610176	S.D. dependent var	0.522358
S.E. of regression	0.326139	Akaike info criterion	-2.164245

Sum squared resid	7.339297	Schwarz criterion	-1.978846
Log likelihood	-19.26120	F-statistic	24.16583
Durbin-Watson stat	1.877252	Prob(F-statistic)	0.000000

Inverted AR Roots .40



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.884348	Probability	0.123768
Obs*R-squared	7.793281	Probability	0.099451

White Heteroskedasticity Test:

F-statistic	3.656962	Probability	0.001399
Obs*R-squared	23.03460	Probability	0.003320

Estimation Command:

LS M5 C CL12 D2 TREND M5(-4) AR(1)

Estimation Equation:

M5 = C(1) + C(2)*CL12 + C(3)*D2 + C(4)*TREND + C(5)*M5(-4) + [AR(1)=C(6)]

Substituted Coefficients:

M5 = 6.9137015 - 1.8923602*CL12 - 0.16378505*D2 + 0.019069095*TREND + 0.40492821*M5(-4) + [AR(1)=0.39664866]

Actual: M5 Forecast: M5F
Sample: 1977:2 1995:4
Include observations: 75

Root Mean Squared Error		0.347447
Mean Absolute Error		0.241585
Mean Absolute Percentage Error		306.2585
Theil Inequality Coefficient		0.242847
Bias Proportion	0.000418	
Variance Proportion	0.182256	
Covariance Proportion	0.817326	

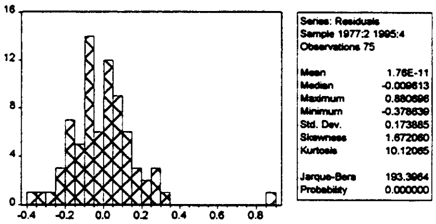
6. UK TO MALTA:
LS // Dependent Variable is M6
Date: 01/13/98 Time: 18:58
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.444937	0.868957	-5.115256	0.0000
IN21	1.233077	0.223537	5.516221	0.0000
EX13	1.462627	0.663567	2.204189	0.0311
S10	-0.600575	0.309267	-1.941929	0.0565
D2	0.565830	0.087813	6.443588	0.0000
D3	-1.419779	0.199205	-7.127214	0.0000
D4	1.737461	0.252835	6.871910	0.0000

TREND	0.004736	0.003342	1.416974	0.1613
M6(-4)	0.182240	0.096798	1.882683	0.0642
AR(1)	0.200040	0.127118	1.573649	0.1204

R-squared	0.873280	Mean dependent var	0.510925
Adjusted R-squared	0.855734	S.D. dependent var	0.488473
S.E. of regression	0.185533	Akaike info criterion	-3.245478
Sum squared resid	2.237465	Schwarz criterion	-2.936479
Log likelihood	25.28503	F-statistic	49.77144
Durbin-Watson stat	1.964795	Prob(F-statistic)	0.000000

Inverted AR Roots .20



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.113578	Probability	0.021351
Obs*R-squared	12.71638	Probability	0.012748

White Heteroskedasticity Test:

F-statistic	2.808799	Probability	0.003318
Obs*R-squared	28.08384	Probability	0.008809

stimation Command:

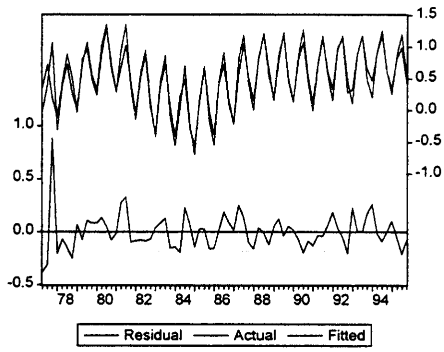
LS M6 C IN21 EX13 S10 D2 D3 D4 TREND M6(-4) AR(1)

Estimation Equation:

M6 = C(1) + C(2)*IN21 + C(3)*EX13 + C(4)*S10 + C(5)*D2 + C(6)*D3 + C(7)*D4 + C(8)*TREND + C(9)*M6(-4) + [AR(1)=C(10)]

Substituted Coefficients:

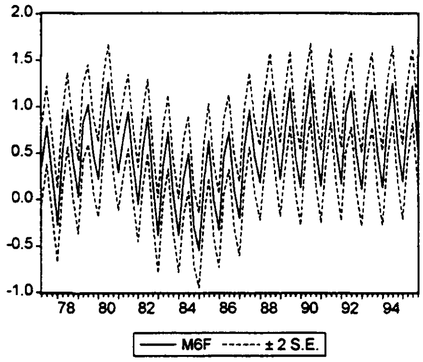
M6 = -4.4449373 + 1.2330773*IN21 + 1.4626267*EX13 - 0.60057475*S10 + 0.56583008*D2 - 1.4197792*D3 + 1.737461*D4 + 0.004736231 8*TREND + 0.18224034*M6(-4) + [AR(1)=0.20003965]



Actual: M6 Forecast: M6F
Sample: 1977:2 1995:4
Include observations: 75

Root Mean Squared Error 0.175817

Mean Absolute Error		0.125839
Mean Absolute Percentage Error		120.5535
Theil Inequality Coefficient		0.127164
Bias Proportion	0.000044	
Variance Proportion	0.047202	
Covariance Proportion	0.952754	



7. USA TO MALTA:
LS // Dependent Variable is M7
Date: 01/13/98 Time: 20:19
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-14.40841	4.199904	-3.430652	0.0011
IN20	2.692717	0.935537	2.878257	0.0054
D2	0.327597	0.063601	5.150812	0.0000
D3	-0.740611	0.137357	-5.391855	0.0000
D4	0.899758	0.171116	5.258163	0.0000
DM79	-0.219362	0.113109	-1.939392	0.0568
DM86	-0.174455	0.105665	-1.651026	0.1036
TREND	-0.007261	0.003621	-2.005399	0.0491
M7(-4)	0.458837	0.093330	4.916268	0.0000
AR(1)	0.520466	0.098532	5.282219	0.0000

R-squared	0.887384	Mean dependent var	-4.781142
Adjusted R-squared	0.871791	S.D. dependent var	0.401051
S.E. of regression	0.143602	Akaike info criterion	-3.757860
Sum squared resid	1.340391	Schwarz criterion	-3.448862
Log likelihood	44.49937	F-statistic	56.90924
Durbin-Watson stat	2.028273	Prob(F-statistic)	0.000000

Inverted AR Roots .52

LS // Dependent Variable is M7
Date: 01/13/98 Time: 20:19
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-14.40841	4.199904	-3.430652	0.0011
IN20	2.692717	0.935537	2.878257	0.0054
D2	0.327597	0.063601	5.150812	0.0000
D3	-0.740611	0.137357	-5.391855	0.0000
D4	0.899758	0.171116	5.258163	0.0000
DM79	-0.219362	0.113109	-1.939392	0.0568
DM86	-0.174455	0.105665	-1.651026	0.1036
TREND	-0.007261	0.003621	-2.005399	0.0491

M7(-4)	0.458837	0.093330	4.916268	0.0000
AR(1)	0.520466	0.098532	5.282219	0.0000

R-squared	0.887384	Mean dependent var	-4.781142
Adjusted R-squared	0.871791	S.D. dependent var	0.401051
S.E. of regression	0.143602	Akaike info criterion	-3.757860
Sum squared resid	1.340391	Schwarz criterion	-3.448862
Log likelihood	44.49937	F-statistic	56.90924
Durbin-Watson stat	2.028273	Prob(F-statistic)	0.000000

Inverted AR Roots .52

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.459799	Probability	0.764899
Obs*R-squared	2.195121	Probability	0.699923

White Heteroskedasticity Test:

F-statistic	0.866344	Probability	0.576704
Obs*R-squared	9.854351	Probability	0.543534

Estimation Command:

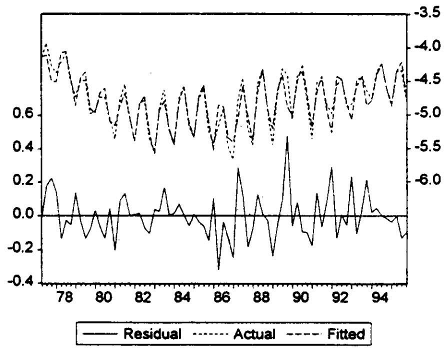
LS M7 C IN20 D2 D3 D4 DM79 DM86 TREND M7(-4) AR(1)

Estimation Equation:

M7 = C(1) + C(2)*IN20 + C(3)*D2 + C(4)*D3 + C(5)*D4 + C(6)*DM79 + C(7)*DM86 + C(8)*TREND + C(9)*M7(-4) + [AR(1)=C(10)]

Substituted Coefficients:

M7 = -14.408407 + 2.6927175*IN20 + 0.32759735*D2 - 0.74061148*D3 + 0.89975767*D4 - 0.21936244*DM79 - 0.17445497*DM86 - 0.0072606693*TREND + 0.45883728*M7(-4) + [AR(1)=0.52046591]



Actual: M7 Forecast: M7F
Sample: 1977:2 1995:4
Include observations: 75

Root Mean Squared Error	0.160071
Mean Absolute Error	0.119454
Mean Absolute Percentage Error	2.477202
Theil Inequality Coefficient	0.016681
Bias Proportion	0.000996
Variance Proportion	0.146933
Covariance Proportion	0.852071

1.3 THE ISLE OF MAN (IOM) INBOUND

1. UK TO IOM

LS // Dependent Variable is I1
Date: 01/14/98 Time: 10:54
Sample(adjusted): 1986:1 1995:4
Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	35.89504	13.10183	2.739697	0.0108
IN21	-10.18752	4.795565	-2.124362	0.0429
CL42	0.878788	6.244456	0.140731	0.8891
EX15	0.722174	0.719884	1.003182	0.3247
FF42	-32.88815	14.29456	-2.300745	0.0294
S21	1.670389	2.180561	0.766036	0.4503
D2	1.973894	0.363651	5.427993	0.0000
D3	-4.570991	0.772673	-5.915816	0.0000
D4	5.030709	0.905367	5.556542	0.0000
DM86	-0.684328	0.518012	-1.321065	0.1976
DM91	0.176286	0.263988	0.667783	0.5099
TREND	-0.041494	0.075143	-0.552200	0.5854
I1(-4)	-0.017911	0.153271	-0.116857	0.9078

R-squared	0.908274	Mean dependent var	-0.811335
Adjusted R-squared	0.867508	S.D. dependent var	1.182129
S.E. of regression	0.430289	Akaike info criterion	-1.429638
Sum squared resid	4.999017	Schwarz criterion	-0.880752
Log likelihood	-15.16478	F-statistic	22.27971
Durbin-Watson stat	2.651983	Prob(F-statistic)	0.000000

2. EIRE TO IOM

LS // Dependent Variable is I2
Date: 01/14/98 Time: 10:55
Sample(adjusted): 1986:1 1995:4
Included observations: 35
Excluded observations: 5 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.947702	7.697519	0.642766	0.5267
IN6	0.959860	3.983370	0.240967	0.8117
CL43	5.624720	6.872894	0.818392	0.4215
EX43	5.101369	6.551718	0.778631	0.4441
FF43	5.571964	7.446376	0.748279	0.4619
D2	1.493425	0.584139	2.556626	0.0176
D3	-4.160560	1.390914	-2.991242	0.0065
D4	4.657684	1.661591	2.803146	0.0101
DM86	-0.271772	0.430285	-0.631609	0.5339
DM91	-0.556972	0.366429	-1.519999	0.1421
TREND	-0.052826	0.082829	-0.637775	0.5299
I2(-4)	0.317817	0.203065	1.565098	0.1312

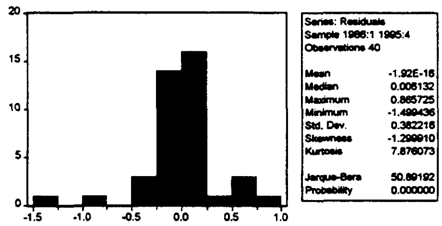
R-squared	0.936947	Mean dependent var	7.693514
Adjusted R-squared	0.906791	S.D. dependent var	1.582520
S.E. of regression	0.483145	Akaike info criterion	-1.189017
Sum squared resid	5.368867	Schwarz criterion	-0.655755
Log likelihood	-16.85505	F-statistic	31.07026
Durbin-Watson stat	2.480962	Prob(F-statistic)	0.000000

1. UK TO IOM
LS // Dependent Variable is I1

Date: 01/15/98 Time: 14:21
Sample(adjusted): 1986:1 1995:4
Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.323167	0.292934	-4.516942	0.0001
D2	1.434509	0.321779	4.458061	0.0001
D3	-3.147237	0.661943	-4.754547	0.0000
D4	3.459091	0.778074	4.445707	0.0001
DM88	-1.123172	0.217566	-5.162450	0.0000
I1(-4)	0.301205	0.125332	2.403256	0.0219

R-squared	0.895459	Mean dependent var	-0.811335
Adjusted R-squared	0.880085	S.D. dependent var	1.182129
S.E. of regression	0.409357	Akaike info criterion	-1.648856
Sum squared resid	5.697478	Schwarz criterion	-1.395524
Log likelihood	-17.78042	F-statistic	58.24602
Durbin-Watson stat	2.060376	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.723235	Probability	0.170901
Obs*R-squared	7.473451	Probability	0.112886

White Heteroskedasticity Test:

F-statistic	4.520203	Probability	0.001902
Obs*R-squared	18.04436	Probability	0.006122

Estimation Command:

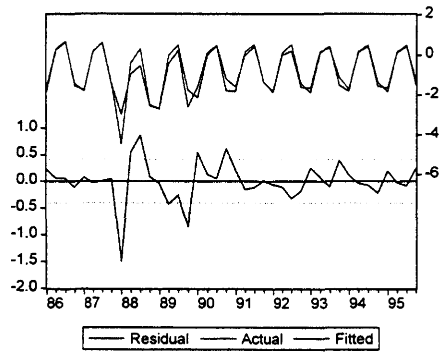
LS I1 C D2 D3 D4 DM88 I1(-4)

Estimation Equation:

I1 = C(1) + C(2)*D2 + C(3)*D3 + C(4)*D4 + C(5)*DM88 + C(6)*I1(-4)

Substituted Coefficients:

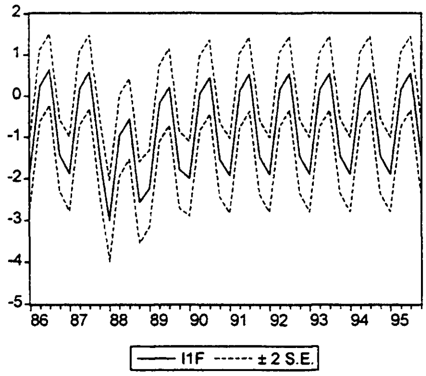
I1 = -1.3231675 + 1.4345087*D2 - 3.1472372*D3 + 3.4590906*D4 - 1.1231724*DM88 + 0.30120477*I1(-4)



Actual: I1 Forecast: I1F

Sample: 1986:1 1995:4
Include observations: 40

Root Mean Squared Error		0.364189
Mean Absolute Error		0.234301
Mean Absolute Percentage Error		141.5828
Theil Inequality Coefficient		0.130940
Bias Proportion	0.000072	
Variance Proportion	0.040969	
Covariance Proportion	0.958959	

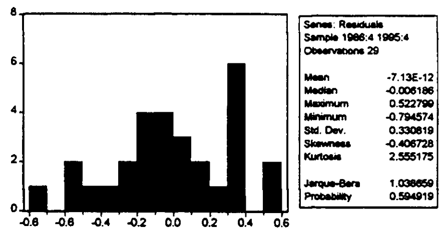


2. EIRE TO IOM:
LS // Dependent Variable is I2
Date: 01/15/98 Time: 13:57
Sample(adjusted): 1986:4 1995:4
Included observations: 29
Excluded observations: 8 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.881686	0.991663	3.914320	0.0007
D2	1.426021	0.424058	3.362797	0.0028
D3	-3.837606	1.095728	-3.502335	0.0020
D4	4.073517	1.271982	3.202496	0.0041
DM91	-0.372002	0.227362	-1.636167	0.1160
I2(-4)	0.338397	0.169391	1.997733	0.0583
AR(3)	0.194854	0.178657	1.090661	0.2872

R-squared	0.951163	Mean dependent var	7.523334
Adjusted R-squared	0.937844	S.D. dependent var	1.496980
S.E. of regression	0.373214	Akaike info criterion	-1.764703
Sum squared resid	3.064346	Schwarz criterion	-1.434666
Log likelihood	-8.561021	F-statistic	71.41327
Durbin-Watson stat	1.718573	Prob(F-statistic)	0.000000

Inverted AR Roots	.58	-.29+.50i	-.29 -.50i



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.820279	Probability	0.529015
Obs*R-squared	4.471209	Probability	0.345975

White Heteroskedasticity Test:

F-statistic	1.203633	Probability	0.341312
Obs*R-squared	7.166983	Probability	0.305681

Estimation Command:

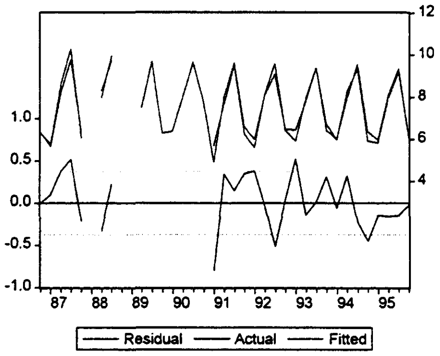
LS I2 C D2 D3 D4 DM91 I2(-4) AR(3)

Estimation Equation:

I2 = C(1) + C(2)*D2 + C(3)*D3 + C(4)*D4 + C(5)*DM91 + C(6)*I2(-4) + [AR(3)=C(7)]

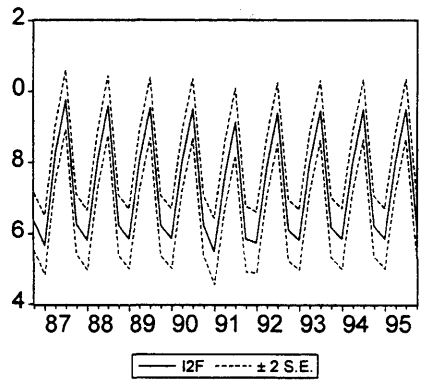
Substituted Coefficients:

I2 = 3.8816864 + 1.4260207*D2 - 3.8376063*D3 + 4.0735168*D4 - 0.37200194*DM91 + 0.3383971*I2(-4) + [AR(3)=0.19485409]



Actual: I2 Forecast: I2F
Sample: 1986:4 1995:4
Include observations: 34

Root Mean Squared Error		0.428412
Mean Absolute Error		0.314864
Mean Absolute Percentage Error		4.306905
Theil Inequality Coefficient		0.027945
Bias Proportion	0.101167	
Variance Proportion	0.000288	
Covariance Proportion	0.898545	



1.4 AUSTRIA INBOUND

1. DENMARK TO AUSTRIA

LS // Dependent Variable is A1
Date: 01/11/98 Time: 17:57
Sample(adjusted): 1977:1 1995:4

Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.407823	1.751622	-0.803726	0.4246
IN2	0.242285	0.242950	0.997262	0.3225
CL1	-0.334648	0.281845	-1.187348	0.2395
EX1	0.215096	0.387315	0.555352	0.5806
FF1	0.499701	0.590138	0.846752	0.4003
S1	-0.023860	0.063096	-0.378159	0.7066
D2	-0.105305	0.044668	-2.357508	0.0215
D3	0.045114	0.059486	0.758395	0.4510
D4	-0.245067	0.108996	-2.248401	0.0281
DM79	-0.072624	0.058428	-1.242960	0.2185
DM91	0.023406	0.055431	0.422250	0.6743
TREND	-0.004102	0.002863	-1.432985	0.1568
A1(-4)	0.855712	0.068042	12.57625	0.0000

R-squared	0.983582	Mean dependent var	1.937285
Adjusted R-squared	0.980455	S.D. dependent var	0.708584
S.E. of regression	0.099062	Akaike info criterion	-4.469519
Sum squared resid	0.618232	Schwarz criterion	-4.070841
Log likelihood	75.00240	F-statistic	314.5301
Durbin-Watson stat	2.156786	Prob(F-statistic)	0.000000

2. FRANCE TO AUSTRIA:

LS // Dependent Variable is A2
Date: 01/11/98 Time: 18:10
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.08117	3.304297	-3.656198	0.0005
IN3	1.797980	0.454420	3.956651	0.0002
CL2	-1.781155	0.498309	-3.574400	0.0007
EX2	-1.508194	0.673697	-2.238682	0.0287
FF2	-0.731395	1.083754	-0.674872	0.5022
S2	-0.132483	0.184368	-0.718581	0.4751
D2	0.307100	0.089007	3.450295	0.0010
D3	-1.251149	0.260004	-4.812040	0.0000
D4	0.868996	0.212797	4.083679	0.0001
DM82	0.066938	0.081627	0.820049	0.4153
DM91	0.089799	0.087651	1.024505	0.3095
TREND	-0.002277	0.003049	-0.747055	0.4578
A2(-4)	0.501818	0.102919	4.875830	0.0000

R-squared	0.976795	Mean dependent var	0.662342
Adjusted R-squared	0.972375	S.D. dependent var	0.878488
S.E. of regression	0.146011	Akaike info criterion	-3.693636
Sum squared resid	1.343116	Schwarz criterion	-3.294958
Log likelihood	45.51885	F-statistic	220.9950
Durbin-Watson stat	1.838355	Prob(F-statistic)	0.000000

3. UK TO AUSTRIA:

LS // Dependent Variable is A3
Date: 01/11/98 Time: 18:17
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.687097	1.820677	-0.926632	0.3577

IN21	0.082880	0.422036	0.196381	0.8449
CL3	-1.082222	0.308934	-3.503088	0.0009
EX3	-0.383530	0.210019	-1.826173	0.0726
FF3	5.996971	3.108672	1.929110	0.0582
S3	0.152328	0.141034	1.080078	0.2842
D2	-0.043500	0.034212	-1.271457	0.2082
D3	0.012143	0.065110	0.186501	0.8527
D4	-0.130290	0.086667	-1.503344	0.1377
DM85	-0.049537	0.066897	-0.740499	0.4617
DM91	-0.179909	0.060305	-2.983302	0.0041
TREND	-0.003691	0.001622	-2.275450	0.0263
A3(-4)	0.869080	0.060274	14.41887	0.0000

R-squared	0.976776	Mean dependent var	0.901715
Adjusted R-squared	0.972353	S.D. dependent var	0.617609
S.E. of regression	0.102693	Akaike info criterion	-4.397523
Sum squared resid	0.664384	Schwarz criterion	-3.998845
Log likelihood	72.26657	F-statistic	220.8130
Durbin-Watson stat	1.814940	Prob(F-statistic)	0.000000

4. CANADA TO AUSTRIA:

LS // Dependent Variable is A4
Date: 01/11/98 Time: 20:22
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.331233	1.223400	-5.992506	0.0000
IN15	1.097388	0.229095	4.790093	0.0000
CL4	-0.762867	0.281571	-2.709323	0.0086
EX4	-0.634908	0.159029	-3.992393	0.0002
FF4	2.160144	1.964217	1.099748	0.2756
D2	0.279065	0.076861	3.630781	0.0006
D3	-0.767264	0.186427	-4.115624	0.0001
D4	0.814734	0.204267	3.988567	0.0002
DM79	-0.061249	0.079469	-0.770728	0.4437
DM91	-0.302452	0.085626	-3.532227	0.0008
TREND	-5.33E-06	0.002469	-0.002160	0.9983
A4(-4)	0.595302	0.089274	6.668254	0.0000

R-squared	0.947995	Mean dependent var	-0.506361
Adjusted R-squared	0.939057	S.D. dependent var	0.548060
S.E. of regression	0.135298	Akaike info criterion	-3.856619
Sum squared resid	1.171546	Schwarz criterion	-3.488609
Log likelihood	50.71220	F-statistic	106.0599
Durbin-Watson stat	1.353553	Prob(F-statistic)	0.000000

5. NETHERLANDS TO AUSTRIA:

LS // Dependent Variable is A5
Date: 01/11/98 Time: 20:38
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.832079	1.930806	1.466786	0.1474
IN9	0.032435	0.205197	0.158070	0.8749
CL5	-0.122548	0.275961	-0.444078	0.6585
EX5	1.473629	0.785526	1.875977	0.0653
FF5	1.967696	1.443808	1.362852	0.1778
S4	-0.102035	0.067409	-1.513659	0.1351

D2	-0.192565	0.049101	-3.921787	0.0002
D3	0.240296	0.057689	4.165328	0.0001
D4	-0.431220	0.108302	-3.981660	0.0002
DM82	-0.061847	0.045062	-1.372485	0.1748
DM91	0.002190	0.042778	0.051200	0.9593
TREND	-0.004861	0.001509	-3.221663	0.0020
A5(-4)	0.879201	0.043968	19.99622	0.0000

R-squared	0.988492	Mean dependent var	2.825736
Adjusted R-squared	0.986300	S.D. dependent var	0.690558
S.E. of regression	0.080827	Akaike info criterion	-4.876394
Sum squared resid	0.411574	Schwarz criterion	-4.477716
Log likelihood	90.46363	F-statistic	450.9679
Durbin-Watson stat	2.547827	Prob(F-statistic)	0.000000

6. USA TO AUSTRIA:

LS // Dependent Variable is A6
Date: 01/11/98 Time: 21:32
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.45225	6.955357	1.502762	0.1379
IN20	-1.800692	1.211037	-1.486901	0.1420
CL6	0.811975	1.206007	0.673275	0.5032
EX6	0.396673	0.429931	0.922642	0.3597
FF6	-13.44766	6.028119	-2.230822	0.0293
D2	0.558696	0.143161	3.902569	0.0002
D3	-1.400027	0.344699	-4.061596	0.0001
D4	1.581136	0.402787	3.925488	0.0002
DM78	0.060905	0.114149	0.533556	0.5955
DM86	-0.398413	0.114862	-3.468630	0.0009
DM91	-0.396995	0.120264	-3.301021	0.0016
TREND	0.007510	0.006164	1.218450	0.2276
A6(-4)	0.363518	0.141738	2.564712	0.0127

R-squared	0.917627	Mean dependent var	-0.619434
Adjusted R-squared	0.901937	S.D. dependent var	0.592479
S.E. of regression	0.185535	Akaike info criterion	-3.214520
Sum squared resid	2.168657	Schwarz criterion	-2.815842
Log likelihood	27.31244	F-statistic	58.48459
Durbin-Watson stat	1.225432	Prob(F-statistic)	0.000000

7. TURKEY TO AUSTRIA:

LS // Dependent Variable is A7
Date: 01/14/98 Time: 10:21
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.626167	1.027183	0.609596	0.5443
IN12	-0.160713	0.220470	-0.728956	0.4687
CL7	0.384203	0.192637	1.994435	0.0504
EX7	0.273576	0.270708	1.010592	0.3161
FF7	3.877070	3.119979	1.242659	0.2186
S5	-0.039544	0.163722	-0.241530	0.8099
D2	-0.006996	0.070839	-0.098757	0.9216
D3	-0.014074	0.133248	-0.105620	0.9162
D4	0.001500	0.186149	0.008056	0.9936
DM78	-0.479027	0.132461	-3.616364	0.0006
DM90	-0.441696	0.140794	-3.137183	0.0026

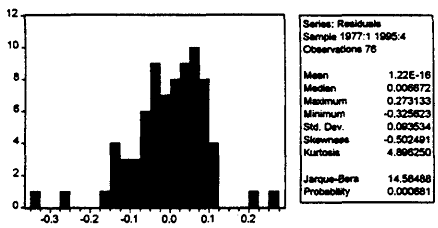
TREND	0.039949	0.013643	2.928222	0.0047
A7(-4)	0.774284	0.126916	6.100779	0.0000

R-squared	0.738462	Mean dependent var	-2.178840
Adjusted R-squared	0.688645	S.D. dependent var	0.367779
S.E. of regression	0.205218	Akaike info criterion	-3.012862
Sum squared resid	2.653198	Schwarz criterion	-2.614184
Log likelihood	19.64944	F-statistic	14.82353
Durbin-Watson stat	0.924192	Prob(F-statistic)	0.000000

1. DENMARK TO AUSTRIA:
LS // Dependent Variable is A1
Date: 01/11/98 Time: 19:23
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.672949	1.207004	-1.386034	0.1702
IN2	0.332639	0.205462	1.618982	0.1100
CL1	-0.333314	0.176561	-1.887813	0.0633
D2	-0.095790	0.037673	-2.542652	0.0132
D4	-0.217655	0.086549	-2.514820	0.0142
TREND	-0.003471	0.001638	-2.118595	0.0377
A1(-4)	0.838028	0.061819	13.55607	0.0000

R-squared	0.982576	Mean dependent var	1.937285
Adjusted R-squared	0.981061	S.D. dependent var	0.708584
S.E. of regression	0.097516	Akaike info criterion	-4.567901
Sum squared resid	0.656142	Schwarz criterion	-4.353228
Log likelihood	72.74090	F-statistic	648.4998
Durbin-Watson stat	2.093829	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.402152	Probability	0.243154
Obs*R-squared	6.036858	Probability	0.196413

White Heteroskedasticity Test:

F-statistic	1.351063	Probability	0.218283
Obs*R-squared	14.32240	Probability	0.215664

stimation Command:

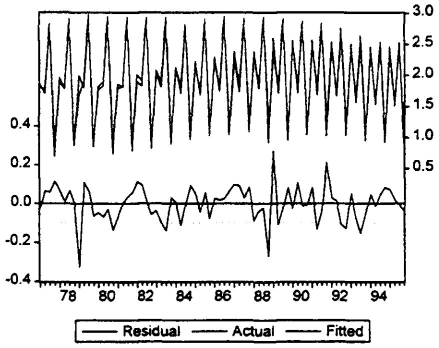
LS A1 C IN2 CL1 D2 D4 TREND A1(-4)

Estimation Equation:

A1 = C(1) + C(2)*IN2 + C(3)*CL1 + C(4)*D2 + C(5)*D4 + C(6)*TREND + C(7)*A1(-4)

Substituted Coefficients:

A1 = -1.6729491 + 0.33263867*IN2 - 0.33331421*CL1 - 0.095789887*D2 - 0.21765488*D4 - 0.0034708669*TREND + 0.83802846*A1(-4)



Actual: A1 Forecast: A1F
Sample: 1977:1 1995:4
Include observations: 76

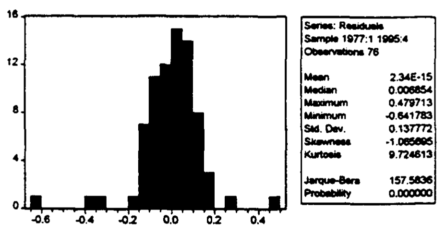
Root Mean Squared Error		0.133447
Mean Absolute Error		0.106238
Mean Absolute Percentage Error		5.989570
Theil Inequality Coefficient		0.032412
Bias Proportion	0.000158	
Variance Proportion	0.022555	
Covariance Proportion	0.977286	

2. FRANCE TO AUSTRIA:

LS // Dependent Variable is A2
Date: 01/11/98 Time: 19:34
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.65522	2.964923	-3.931036	0.0002
IN3	1.550279	0.390996	3.964946	0.0002
CL2	-1.835692	0.433844	-4.231229	0.0001
EX2	-1.659150	0.530730	-3.126166	0.0026
D2	0.306381	0.085740	3.573365	0.0007
D3	-1.195078	0.254735	-4.691459	0.0000
D4	0.843622	0.207410	4.067421	0.0001
A2(-4)	0.523387	0.100676	5.198734	0.0000

R-squared	0.975405	Mean dependent var	0.662342
Adjusted R-squared	0.972873	S.D. dependent var	0.878488
S.E. of regression	0.144690	Akaike info criterion	-3.767028
Sum squared resid	1.423585	Schwarz criterion	-3.521688
Log likelihood	43.30775	F-statistic	385.2524
Durbin-Watson stat	1.804170	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.169540	Probability	0.082408
Obs*R-squared	9.074806	Probability	0.059257

White Heteroskedasticity Test:

F-statistic	3.231927	Probability	0.001497
Obs*R-squared	27.14072	Probability	0.004376

stimation Command:

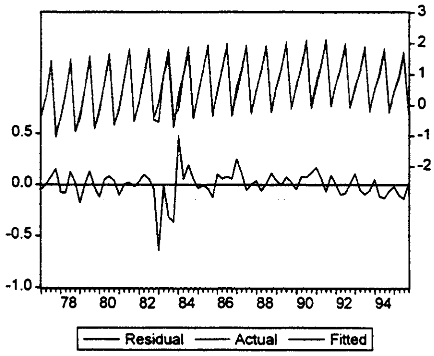
LS A2 C IN3 CL2 EX2 D2 D3 D4 A2(-4)

Estimation Equation:

A2 = C(1) + C(2)*IN3 + C(3)*CL2 + C(4)*EX2 + C(5)*D2 + C(6)*D3 + C(7)*D4 + C(8)*A2(-4)

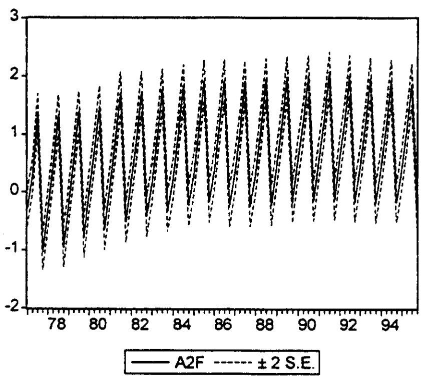
Substituted Coefficients:

A2 = -11.65522 + 1.5502793*IN3 - 1.8356917*CL2 - 1.6591502*EX2 + 0.30638074*D2 - 1.1950784*D3 + 0.84362202*D4 + 0.52338735*A2(-4)



Actual: A2 Forecast: A2F
Sample: 1977:1 1995:4
Include observations: 76

Root Mean Squared Error		0.154472
Mean Absolute Error		0.114535
Mean Absolute Percentage Error		44.63780
Theil Inequality Coefficient		0.071175
Bias Proportion	0.001425	
Variance Proportion	0.019879	
Covariance Proportion	0.978696	

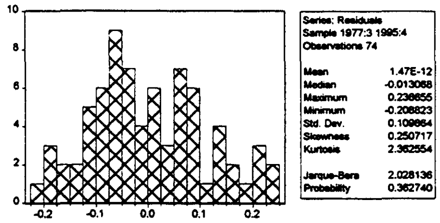


3. UK TO AUSTRIA:
LS // Dependent Variable is A3
Date: 01/11/98 Time: 22:41
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.504847	0.469074	-1.076262	0.2856
IN21	0.193576	0.125702	1.539966	0.1282
DM91	-0.152150	0.066860	-2.275644	0.0260
TREND	-0.003572	0.001100	-3.246529	0.0018
A3(-4)	0.963967	0.022383	43.06689	0.0000
AR(2)	0.385306	0.106787	3.608187	0.0006

R-squared	0.968183	Mean dependent var	0.919209
Adjusted R-squared	0.965843	S.D. dependent var	0.615923
S.E. of regression	0.113832	Akaike info criterion	-4.268464
Sum squared resid	0.881121	Schwarz criterion	-4.081648
Log likelihood	58.93171	F-statistic	413.8441
Durbin-Watson stat	1.613501	Prob(F-statistic)	0.000000

Inverted AR Roots .62 -.62



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.468095	Probability	0.053540
Obs*R-squared	9.889437	Probability	0.042332

White Heteroskedasticity Test:

F-statistic	1.815230	Probability	0.098937
Obs*R-squared	11.94676	Probability	0.102323

Estimation Command:

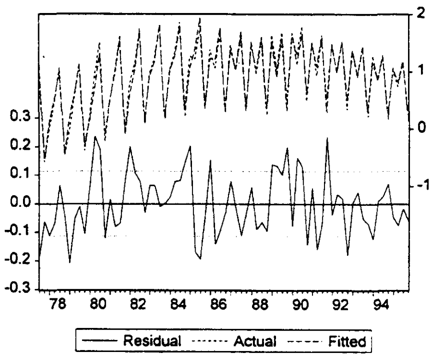
LS A3 C IN21 DM91 TREND A3(-4) AR(2)

Estimation Equation:

A3 = C(1) + C(2)*IN21 + C(3)*DM91 + C(4)*TREND + C(5)*A3(-4) + [AR(2)=C(6)]

Substituted Coefficients:

A3 = -0.5048469 + 0.19357613*IN21 - 0.15214999*DM91 - 0.0035718027*TREND + 0.96396658*A3(-4) + [AR(2)=0.38530607]



Actual: A3 Forecast: A3F

Sample: 1977:3 1995:4
Include observations: 74

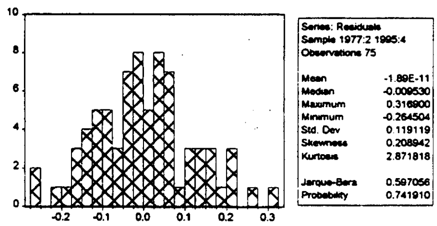
Root Mean Squared Error		0.243911
Mean Absolute Error		0.185217
Mean Absolute Percentage Error		175.8161
Theil Inequality Coefficient		0.114119
Bias Proportion	0.002039	
Variance Proportion	0.238604	
Covariance Proportion	0.759357	

4. CANADA TO AUSTRIA:
LS // Dependent Variable is A4
Date: 01/11/98 Time: 20:25
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.088356	2.247720	-2.708681	0.0086
IN15	1.235342	0.495490	2.493170	0.0152
CL4	-0.384408	0.381448	-1.007759	0.3173
D2	0.430078	0.091723	4.688897	0.0000
D3	-1.154558	0.240937	-4.791946	0.0000
D4	1.196756	0.253952	4.712537	0.0000
DM91	-0.176424	0.101983	-1.729942	0.0883
A4(-4)	0.394610	0.120176	3.283592	0.0016
AR(1)	0.705344	0.094850	7.436424	0.0000

R-squared	0.952847	Mean dependent var	-0.499611
Adjusted R-squared	0.947131	S.D. dependent var	0.548561
S.E. of regression	0.126132	Akaike info criterion	-4.028690
Sum squared resid	1.050008	Schwarz criterion	-3.750591
Log likelihood	53.65549	F-statistic	166.7117
Durbin-Watson stat	2.068083	Prob(F-statistic)	0.000000

Inverted AR Roots .71



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.396234	Probability	0.245727
Obs*R-squared	6.197687	Probability	0.184863

White Heteroskedasticity Test:

F-statistic	1.430897	Probability	0.187338
Obs*R-squared	13.70434	Probability	0.186910

Estimation Command:

LS A4 C IN15 CL4 D2 D3 D4 DM91 A4(-4) AR(1)

Estimation Equation:

A4 = C(1) + C(2)*IN15 + C(3)*CL4 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM91 + C(8)*A4(-4) + [AR(1)=C(9)]

Substituted Coefficients:

A4 = -6.0883563 + 1.2353417*IN15 - 0.38440787*CL4 + 0.43007841*D2 - 1.1545583*D3 + 1.1967565*D4 - 0.1764243*DM91 + 0.3946104*A4(-4) + [AR(1)=0.7053444]

Estimation Command:

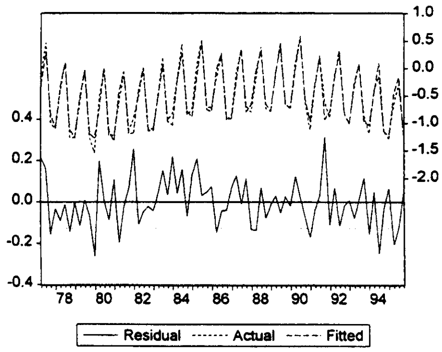
LS A4 C IN15 CL4 D2 D3 D4 DM91 A4(-4) AR(1)

Estimation Equation:

A4 = C(1) + C(2)*IN15 + C(3)*CL4 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM91 + C(8)*A4(-4) + [AR(1)=C(9)]

Substituted Coefficients:

A4 = -6.0883563 + 1.2353417*IN15 - 0.38440787*CL4 + 0.43007841*D2 - 1.1545583*D3 + 1.1967565*D4 - 0.1764243*DM91 + 0.3946104*A4(-4) + [AR(1)=0.7053444]



Actual: A4 Forecast: A4F
Sample: 1977:2 1995:4
Include observations: 75

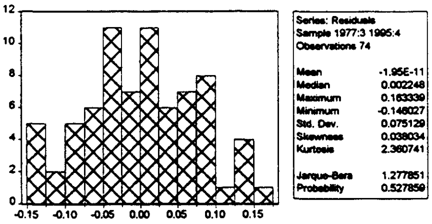
Root Mean Squared Error		0.199100
Mean Absolute Error		0.155768
Mean Absolute Percentage Error		72.86518
Theil Inequality Coefficient		0.135784
Bias Proportion	0.007928	
Variance Proportion	0.029282	
Covariance Proportion	0.962791	

5. NETHERLANDS TO AUSTRIA:
LS // Dependent Variable is A5
Date: 01/11/98 Time: 20:48
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints
Convergence achieved after 7 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.525864	1.298188	1.945684	0.0561
IN9	0.062118	0.033333	1.863571	0.0670
EX5	1.108553	0.701274	1.580770	0.1189
D2	-0.245039	0.060631	-4.041505	0.0001
D3	0.271350	0.068605	3.955246	0.0002
D4	-0.529553	0.133347	-3.971249	0.0002
DM82	-0.078632	0.039200	-2.005897	0.0491
TREND	-0.003847	0.001166	-3.300194	0.0016
A5(-4)	0.827339	0.053416	15.48850	0.0000

AR(2)	-0.199622	0.127306	-1.568044	0.1218

R-squared	0.988441	Mean dependent var	2.832079
Adjusted R-squared	0.986816	S.D. dependent var	0.698798
S.E. of regression	0.080238	Akaike info criterion	-4.920440
Sum squared resid	0.412036	Schwarz criterion	-4.609080
Log likelihood	87.05482	F-statistic	608.1063
Durbin-Watson stat	2.496450	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.993279	Probability	0.025521
Obs*R-squared	12.31030	Probability	0.015187

White Heteroskedasticity Test:

F-statistic	1.631613	Probability	0.106443
Obs*R-squared	17.98069	Probability	0.116278

Estimation Command:

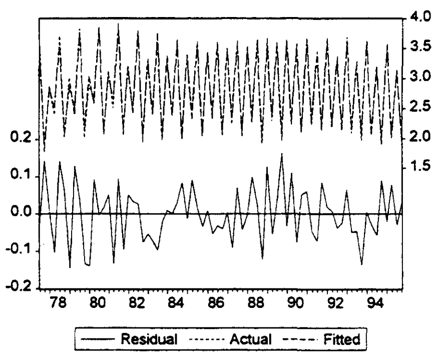
LS A5 C IN9 EX5 D2 D3 D4 DM82 TREND A5(-4) AR(2)

Estimation Equation:

A5 = C(1) + C(2)*IN9 + C(3)*EX5 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM82 + C(8)*TREND + C(9)*A5(-4) + [AR(2)=C(10)]

Substituted Coefficients:

A5 = 2.5258638 + 0.062117775*IN9 + 1.1085526*EX5 - 0.24503908*D2 + 0.27135045*D3 - 0.52955328*D4 - 0.078632116*DM82 - 0.0038468462*TREND + 0.82733878*A5(-4) + [AR(2)=-0.19962186]



Actual: A5 Forecast: A5F
Sample: 1977:3 1995:4
Include observations: 74

Root Mean Squared Error	0.111883
Mean Absolute Error	0.091054
Mean Absolute Percentage Error	3.220425
Theil Inequality Coefficient	0.019201

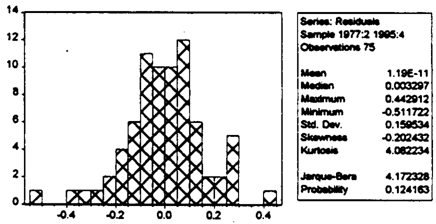
Bias Proportion	0.000049
Variance Proportion	0.047313
Covariance Proportion	0.952638

6. USA TO AUSTRIA:
LS // Dependent Variable is A6
Date: 01/11/98 Time: 21:52
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 12 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.367487	0.480275	0.765160	0.4469
FF6	-6.934382	2.942768	-2.356414	0.0214
D2	0.620373	0.118512	5.234690	0.0000
D3	-1.545601	0.290567	-5.319260	0.0000
D4	1.759729	0.336132	5.235235	0.0000
DM86	-0.283888	0.124740	-2.275843	0.0261
DM91	-0.383356	0.128700	-2.978681	0.0040
A6(-4)	0.318646	0.121452	2.623629	0.0108
AR(1)	0.464583	0.111178	4.178733	0.0001

R-squared	0.926436	Mean dependent var	-0.608152
Adjusted R-squared	0.917519	S.D. dependent var	0.588193
S.E. of regression	0.168926	Akaike info criterion	-3.444418
Sum squared resid	1.883385	Schwarz criterion	-3.166319
Log likelihood	31.74527	F-statistic	103.8967
Durbin-Watson stat	1.817866	Prob(F-statistic)	0.000000

Inverted AR Roots .46



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.256234	Probability	0.296817
Obs*R-squared	5.622838	Probability	0.229141

White Heteroskedasticity Test:

F-statistic	2.409280	Probability	0.019980
Obs*R-squared	18.76094	Probability	0.027304

Estimation Command:

LS A6 C FF6 D2 D3 D4 DM86 DM91 A6(-4) AR(1)

Estimation Equation:

A6 = C(1) + C(2)*FF6 + C(3)*D2 + C(4)*D3 + C(5)*D4 + C(6)*DM86 + C(7)*DM91 + C(8)*A6(-4) + [AR(1)=C(9)]

Substituted Coefficients:

A6 = 0.36748708 - 6.9343816*FF6 + 0.62037322*D2 - 1.545601*D3 + 1.7597293*D4 - 0.28388829*DM86 - 0.38335571*DM91 + 0.31864617*A6(-4) + [AR(1)=0.4645834]

Actual: A6 Forecast: A6F
Sample: 1977:2 1995:4
Include observations: 75

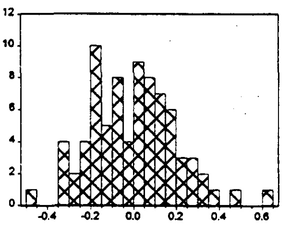
Root Mean Squared Error		0.186422
Mean Absolute Error		0.151645
Mean Absolute Percentage Error		64.36046
Theil Inequality Coefficient		0.112025
Bias Proportion	0.000243	
Variance Proportion	0.037870	
Covariance Proportion	0.961886	

7. TURKEY TO AUSTRIA:
LS // Dependent Variable is A7
Date: 01/11/98 Time: 22:26
Sample(adjusted): 1976:2 1995:4
Included observations: 79 after adjusting endpoints
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.347899	0.496491	-6.743126	0.0000
IN12	0.498871	0.164533	3.032039	0.0034
DM79	-0.301906	0.170810	-1.767501	0.0814
D3	-0.365714	0.049180	-7.436287	0.0000
D4	0.376631	0.085826	4.388337	0.0000
TREND	0.040261	0.016523	2.436717	0.0173
AR(1)	0.553150	0.100123	5.524686	0.0000

R-squared	0.724372	Mean dependent var	-2.156301
Adjusted R-squared	0.701403	S.D. dependent var	0.383082
S.E. of regression	0.209332	Akaike info criterion	-3.043239
Sum squared resid	3.155017	Schwarz criterion	-2.833288
Log likelihood	15.11179	F-statistic	31.53698
Durbin-Watson stat	1.706170	Prob(F-statistic)	0.000000

Inverted AR Roots .55



Series: Residuals	
Sample 1976:2 1995:4	
Observations 79	
Mean	-1.25E-11
Median	0.006399
Maximum	0.633844
Minimum	-0.468161
Std. Dev.	0.201119
Skewness	0.402025
Kurtosis	3.262972
Jarque-Bera	2.355682
Probability	0.307943

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	7.110539	Probability	0.000076
Obs*R-squared	23.29822	Probability	0.000110

White Heteroskedasticity Test:

F-statistic	1.624767	Probability	0.142485
Obs*R-squared	10.90761	Probability	0.142700

Estimation Command:

LS A7 C IN12 DM79 D3 D4 TREND AR(1)

Estimation Equation:

A7 = C(1) + C(2)*IN12 + C(3)*DM79 + C(4)*D3 + C(5)*D4 + C(6)*TREND + [AR(1)=C(7)]

Substituted Coefficients:

A7 = -3.3478993 + 0.49887062*IN12 - 0.30190596*DM79 - 0.3657142*D3 + 0.3766313*D4 + 0.040261466*TREND + [AR(1)=0.55315026]

Actual: A7 Forecast: A7F
Sample: 1976:2 1995:4
Include observations: 79

Root Mean Squared Error		0.237977
Mean Absolute Error		0.180743
Mean Absolute Percentage Error		9.387518
Theil Inequality Coefficient		0.054505
Bias Proportion	0.000021	
Variance Proportion	0.151943	
Covariance Proportion	0.848036	

1.5 UK INBOUNDS

1. USA TO UK

LS // Dependent Variable is U1
Date: 01/14/98 Time: 10:46
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.595600	3.314172	-1.386651	0.1704
IN20	1.148933	0.774823	1.482834	0.1430
CL34	1.093679	1.368825	0.798991	0.4273
EX34	0.677295	0.337154	2.008856	0.0488
FF34	0.591870	1.074387	0.550891	0.5836
D2	0.401933	0.076555	5.250228	0.0000
D3	-1.042956	0.180927	-5.764523	0.0000
D4	1.248237	0.223992	5.572681	0.0000
DM79	-0.082701	0.078458	-1.054088	0.2958
DM91	-0.263825	0.078378	-3.366073	0.0013
TREND	-0.003848	0.006808	-0.565151	0.5739
U1(-4)	0.284576	0.109085	2.608758	0.0113

R-squared	0.917028	Mean dependent var	0.847048
Adjusted R-squared	0.902767	S.D. dependent var	0.400685
S.E. of regression	0.124942	Akaike info criterion	-4.015868
Sum squared resid	0.999077	Schwarz criterion	-3.647857
Log likelihood	56.76364	F-statistic	64.30394
Durbin-Watson stat	1.138051	Prob(F-statistic)	0.000000

2. GERMANY TO UK

LS // Dependent Variable is U2
Date: 01/14/98 Time: 10:47
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.280627	1.157768	-0.242386	0.8093
IN4	0.185510	0.228122	0.813203	0.4192
CL35	-0.274065	0.319761	-0.857093	0.3946
EX35	-0.283099	0.247723	-1.142804	0.2574
FF35	-0.805044	1.568536	-0.513245	0.6096

S15	-0.290490	0.147098	-1.974800	0.0527
D2	0.326970	0.065200	5.014864	0.0000
D3	-0.794046	0.149578	-5.308583	0.0000
D4	0.890386	0.169668	5.247826	0.0000
DM80	0.025607	0.057755	0.443373	0.6590
DM83	-0.072634	0.049841	-1.457295	0.1500
TREND	0.004188	0.003586	1.168159	0.2471
U2(-4)	0.360193	0.112478	3.202344	0.0021

R-squared	0.936963	Mean dependent var	1.853715
Adjusted R-squared	0.924956	S.D. dependent var	0.326717
S.E. of regression	0.089501	Akaike info criterion	-4.672497
Sum squared resid	0.504661	Schwarz criterion	-4.273819
Log likelihood	82.71555	F-statistic	78.03472
Durbin-Watson stat	2.606044	Prob(F-statistic)	0.000000

3. AUSTRIA TO UK

LS // Dependent Variable is U3
Date: 01/14/98 Time: 10:48
Sample(adjusted): 1978:1 1995:4
Included observations: 72 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-16.20280	6.865982	-2.359866	0.0216
IN14	2.332784	0.967025	2.412331	0.0190
CL36	-2.004927	0.783520	-2.558871	0.0131
EX36	0.738859	0.937445	0.788162	0.4338
FF36	1.929853	2.741560	0.703925	0.4842
S17	0.525874	0.344690	1.525643	0.1324
D2	0.276784	0.095537	2.897133	0.0053
D3	-0.917803	0.258077	-3.556310	0.0007
D4	0.788071	0.358022	2.201180	0.0316
DM78	0.019082	0.145714	0.130955	0.8963
DM81	0.090634	0.111431	0.813363	0.4193
TREND	0.016460	0.008661	1.900512	0.0623
U3(-4)	0.210938	0.131370	1.605681	0.1137

R-squared	0.913179	Mean dependent var	1.360196
Adjusted R-squared	0.895521	S.D. dependent var	0.544864
S.E. of regression	0.176117	Akaike info criterion	-3.311226
Sum squared resid	1.830025	Schwarz criterion	-2.900161
Log likelihood	30.04055	F-statistic	51.71348
Durbin-Watson stat	2.181089	Prob(F-statistic)	0.000000

4. FRANCE TO UK

LS // Dependent Variable is U4
Date: 01/14/98 Time: 10:49
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.008477	2.636337	0.761844	0.4490
IN3	-0.306990	0.527553	-0.581913	0.5627
CL37	0.354734	0.471207	0.752821	0.4544
EX37	0.006848	0.248924	0.027511	0.9781
FF37	1.302338	2.126766	0.612356	0.5425
S19	-0.238434	0.208699	-1.142476	0.2576
D2	0.212027	0.071414	2.968960	0.0042
D3	-0.369774	0.152700	-2.421568	0.0183
D4	0.343548	0.161576	2.126228	0.0374
DM79	-0.143160	0.107852	-1.327371	0.1892

DM91	-0.063514	0.075677	-0.839278	0.4045
TREND	0.003943	0.002263	1.742633	0.0863
U4(-4)	0.573767	0.105455	5.440852	0.0000

R-squared	0.900988	Mean dependent var	2.090897
Adjusted R-squared	0.882128	S.D. dependent var	0.408449
S.E. of regression	0.140231	Akaike info criterion	-3.774427
Sum squared resid	1.238872	Schwarz criterion	-3.375749
Log likelihood	48.58890	F-statistic	47.77376
Durbin-Watson stat	2.242674	Prob(F-statistic)	0.000000

5. JAPAN TO UK

LS // Dependent Variable is U5
Date: 01/13/98 Time: 12:46
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-36.77273	8.292110	-4.434665	0.0000
IN19	3.276360	0.747869	4.380927	0.0000
CL38	-0.495853	0.554066	-0.894935	0.3742
EX38	3.526230	0.887125	3.974898	0.0002
FF38	6.027109	1.373260	4.388906	0.0000
D2	-0.107816	0.053651	-2.009571	0.0487
D3	-0.077558	0.085897	-0.902923	0.3700
D4	-0.016660	0.121859	-0.136714	0.8917
DM91	-0.373655	0.089902	-4.156260	0.0001
DM93	-0.161846	0.086292	-1.875555	0.0653
TREND	0.009701	0.008790	1.103687	0.2739
U5(-4)	0.295276	0.105689	2.793813	0.0069

R-squared	0.946761	Mean dependent var	-0.586759
Adjusted R-squared	0.937610	S.D. dependent var	0.599445
S.E. of regression	0.149729	Akaike info criterion	-3.653915
Sum squared resid	1.434806	Schwarz criterion	-3.285904
Log likelihood	43.00943	F-statistic	103.4652
Durbin-Watson stat	1.508984	Prob(F-statistic)	0.000000

6. FINLAND TO UK

LS // Dependent Variable is U6
Date: 01/14/98 Time: 10:51
Sample(adjusted): 1978:1 1995:4
Included observations: 72 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.270732	3.940412	-0.830048	0.4099
IN16	0.941838	0.526097	1.790236	0.0785
CL39	-0.050654	1.363697	-0.037144	0.9705
EX39	0.046101	0.941707	0.048955	0.9611
FF39	-0.566517	3.390288	-0.167100	0.8679
S28	-0.306722	0.332590	-0.922223	0.3602
D2	0.421175	0.114854	3.667044	0.0005
D3	-0.952648	0.234177	-4.068066	0.0001
D4	1.064303	0.308019	3.455318	0.0010
DM79	-0.087031	0.156455	-0.556265	0.5801
DM91	-0.149696	0.169069	-0.885411	0.3795
TREND	0.004234	0.003896	1.086589	0.2816
U6(-4)	0.214036	0.125519	1.705205	0.0934

R-squared	0.796059	Mean dependent var	1.372654
Adjusted R-squared	0.754579	S.D. dependent var	0.514852

S.E. of regression	0.255058	Akaike info criterion	-2.570549
Sum squared resid	3.838210	Schwarz criterion	-2.159484
Log likelihood	3.376191	F-statistic	19.19157
Durbin-Watson stat	2.064538	Prob(F-statistic)	0.000000

7. SPAIN TO UK

LS // Dependent Variable is U7
Date: 01/14/98 Time: 10:51
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.820513	2.328275	0.352413	0.7257
IN10	0.176502	0.279137	0.632315	0.5295
CL40	0.434948	0.326801	1.330924	0.1880
EX40	0.112618	0.237842	0.473499	0.6375
FF40	0.171646	1.802280	0.095238	0.9244
S29	-0.336234	0.166751	-2.016385	0.0480
D2	-0.010569	0.037853	-0.279211	0.7810
D3	-0.549465	0.107393	-5.116407	0.0000
D4	0.676337	0.135788	4.980846	0.0000
DM78	-0.104359	0.070801	-1.473976	0.1455
DM90	-0.006727	0.063307	-0.106261	0.9157
TREND	0.015160	0.003798	3.991398	0.0002
U7(-4)	0.141575	0.122791	1.152975	0.2533

R-squared	0.950172	Mean dependent var	0.967991
Adjusted R-squared	0.940681	S.D. dependent var	0.476584
S.E. of regression	0.116075	Akaike info criterion	-4.152537
Sum squared resid	0.848820	Schwarz criterion	-3.753859
Log likelihood	62.95707	F-statistic	100.1119
Durbin-Watson stat	1.986270	Prob(F-statistic)	0.000000

8. IOM TO UK

LS // Dependent Variable is U8
Date: 01/14/98 Time: 10:52
Sample(adjusted): 1986:1 1995:4
Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.319766	1.884006	1.231294	0.2285
IN22	1.245410	0.951407	1.309019	0.2012
CL41	1.896728	2.352466	0.806272	0.4269
EX15	0.036372	0.120236	0.302503	0.7645
FF41	-2.932494	6.309156	-0.464800	0.6457
D2	0.413991	0.117331	3.528399	0.0015
D3	-0.726699	0.203936	-3.563368	0.0013
D4	0.952802	0.275210	3.462093	0.0017
DM89	-0.001419	0.105407	-0.013459	0.9894
DM90	-0.155959	0.093874	-1.661370	0.1078
TREND	-0.009092	0.017535	-0.518476	0.6082
U8(-4)	0.059254	0.239829	0.247069	0.8067

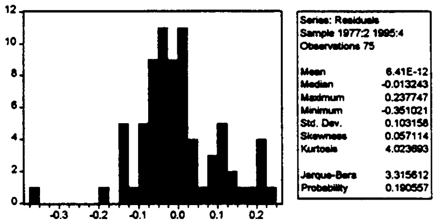
R-squared	0.743770	Mean dependent var	6.258482
Adjusted R-squared	0.643108	S.D. dependent var	0.222439
S.E. of regression	0.132886	Akaike info criterion	-3.793197
Sum squared resid	0.494446	Schwarz criterion	-3.286534
Log likelihood	31.10641	F-statistic	7.388794
Durbin-Watson stat	1.784389	Prob(F-statistic)	0.000009

1. USA TO UK:
LS // Dependent Variable is U1
Date: 01/14/98 Time: 21:47
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 12 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.293837	1.422391	-2.315705	0.0237
IN20	0.868404	0.325946	2.664255	0.0097
EX34	0.474028	0.133797	3.542877	0.0007
D2	0.351867	0.075348	4.669917	0.0000
D3	-0.908255	0.185489	-4.896548	0.0000
D4	1.081034	0.225078	4.802941	0.0000
DM86	-0.143138	0.078065	-1.833567	0.0713
DM91	-0.289354	0.078168	-3.701695	0.0004
U1(-4)	0.373944	0.116019	3.223117	0.0020
AR(1)	0.380018	0.115986	3.276403	0.0017

R-squared	0.930951	Mean dependent var	0.857615
Adjusted R-squared	0.921391	S.D. dependent var	0.392577
S.E. of regression	0.110068	Akaike info criterion	-4.289742
Sum squared resid	0.787478	Schwarz criterion	-3.980743
Log likelihood	64.44493	F-statistic	97.37369
Durbin-Watson stat	1.943135	Prob(F-statistic)	0.000000

Inverted AR Roots .38



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.547206	Probability	0.701715
Obs*R-squared	2.597954	Probability	0.627186

White Heteroskedasticity Test:

F-statistic	1.733325	Probability	0.086304
Obs*R-squared	17.42479	Probability	0.095923

Estimation Command:

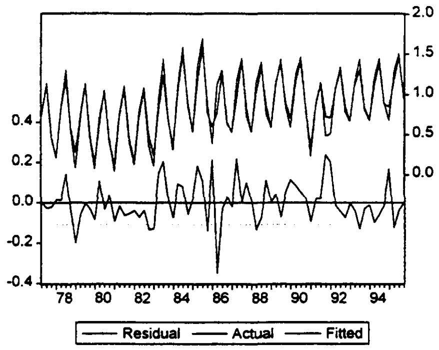
LS U1 C IN20 EX34 D2 D3 D4 DM86 DM91 U1(-4) AR(1)

Estimation Equation:

U1 = C(1) + C(2)*IN20 + C(3)*EX34 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM86 + C(8)*DM91 + C(9)*U1(-4) + [AR(1)=C(10)]

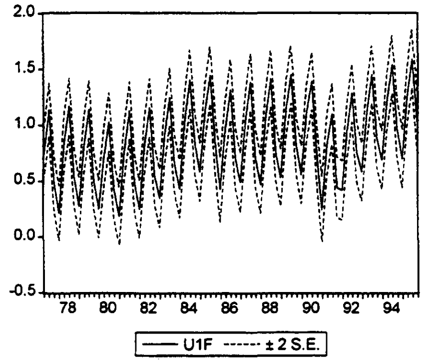
Substituted Coefficients:

U1 = -3.2938371 + 0.86840409*IN20 + 0.47402751*EX34 + 0.35186733*D2 - 0.90825542*D3 + 1.0810339*D4 - 0.14313804*DM86 - 0.28935416*DM91 + 0.3739438*U1(-4) + [AR(1)=0.3800181]



Actual: U1 Forecast: U1F
Sample: 1977:2 1995:4
Include observations: 75

Root Mean Squared Error		0.115795
Mean Absolute Error		0.092272
Mean Absolute Percentage Error		24.84842
Theil Inequality Coefficient		0.061828
Bias Proportion	0.000160	
Variance Proportion	0.046174	
Covariance Proportion	0.953666	

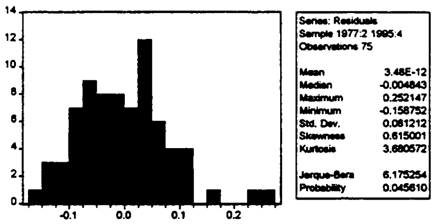


2. GERMANY TO UK:
LS // Dependent Variable is U2
Date: 01/14/98 Time: 22:07
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.540883	0.183681	-2.944692	0.0045
IN4	0.269478	0.048941	5.506243	0.0000
S15	-0.269821	0.059298	-4.550285	0.0000
D2	0.341023	0.053588	6.363827	0.0000
D3	-0.827634	0.115924	-7.139426	0.0000
D4	0.920815	0.137242	6.709442	0.0000
DM83	-0.069972	0.039020	-1.793215	0.0775
U2(-4)	0.336815	0.084170	4.001608	0.0002
AR(1)	-0.269732	0.119099	-2.264766	0.0268

R-squared	0.936169	Mean dependent var	1.861659
Adjusted R-squared	0.928432	S.D. dependent var	0.321444
S.E. of regression	0.085993	Akaike info criterion	-4.794802
Sum squared resid	0.488062	Schwarz criterion	-4.516703
Log likelihood	82.38469	F-statistic	120.9972
Durbin-Watson stat	2.025046	Prob(F-statistic)	0.000000

Inverted AR Roots -.27



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.087230	Probability	0.410431
Obs*R-squared	42.45746	Probability	0.212634

White Heteroskedasticity Test:

F-statistic	0.566213	Probability	0.835231
Obs*R-squared	6.095990	Probability	0.807135

Estimation Command:

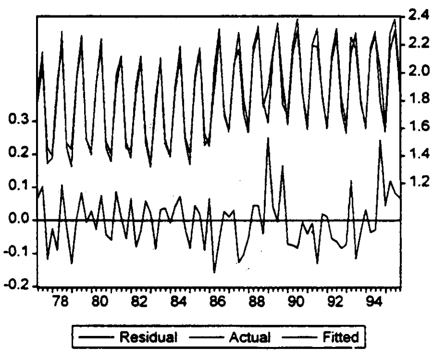
LS U2 C IN4 S15 D2 D3 D4 DM83 U2(-4) AR(1)

Estimation Equation:

U2 = C(1) + C(2)*IN4 + C(3)*S15 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM83 + C(8)*U2(-4) + [AR(1)=C(9)]

Substituted Coefficients:

U2 = -0.54088264 + 0.26947833*IN4 - 0.26982109*S15 + 0.34102258*D2 - 0.82763369*D3 + 0.92081493*D4 - 0.069971965*DM83 + 0.33681474*U2(-4) + [AR(1)=-0.26973227]



Actual: U2 Forecast: U2F
Sample: 1977:2 1995:4
Include observations: 75

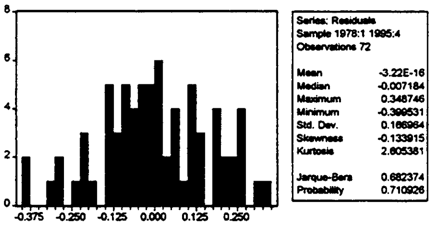
Root Mean Squared Error		0.087098
Mean Absolute Error		0.067410
Mean Absolute Percentage Error		3.650120
Theil Inequality Coefficient		0.023057
Bias Proportion	0.000321	
Variance Proportion	0.015349	
Covariance Proportion	0.984330	

3. AUSTRIA TO UK:
LS // Dependent Variable is U3
Date: 01/15/98 Time: 10:15
Sample(adjusted): 1978:1 1995:4
Included observations: 72 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	-7.001235	3.299227	-2.122083	0.0377
IN14	1.143757	0.489417	2.336979	0.0226
CL36	-1.024560	0.533649	-1.919914	0.0593
D2	0.292462	0.077946	3.752102	0.0004
D3	-0.976316	0.203659	-4.793875	0.0000
D4	0.983477	0.250284	3.929438	0.0002
TREND	0.010856	0.002519	4.310245	0.0001
U3(-4)	0.269964	0.120231	2.245383	0.0282

R-squared	0.906099	Mean dependent var	1.360196
Adjusted R-squared	0.895829	S.D. dependent var	0.544864
S.E. of regression	0.175858	Akaike info criterion	-3.371723
Sum squared resid	1.979256	Schwarz criterion	-3.118760
Log likelihood	27.21845	F-statistic	88.22459
Durbin-Watson stat	2.145304	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.342394	Probability	0.848265
Obs*R-squared	1.606813	Probability	0.807567

White Heteroskedasticity Test:

F-statistic	0.839070	Probability	0.602463
Obs*R-squared	9.599099	Probability	0.566767

Estimation Command:

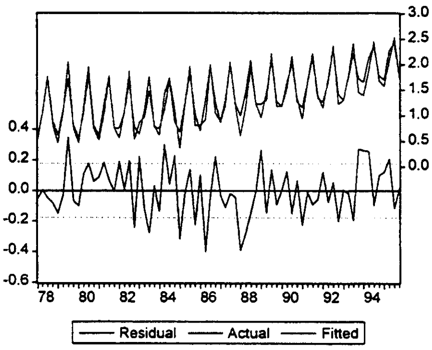
LS U3 C IN14 CL36 D2 D3 D4 TREND U3(-4)

Estimation Equation:

U3 = C(1) + C(2)*IN14 + C(3)*CL36 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*TREND + C(8)*U3(-4)

Substituted Coefficients:

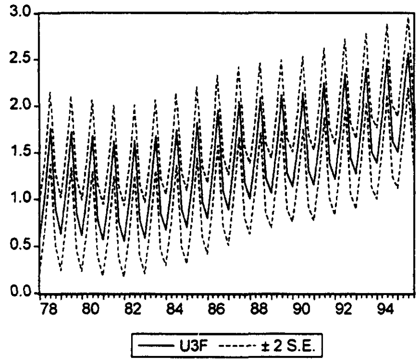
U3 = -7.0012354 + 1.1437572*IN14 - 1.0245601*CL36 + 0.29246206*D2 - 0.97631605*D3 + 0.98347694*D4 + 0.010856328*TREND + 0.26996441*U3(-4)



Actual: U3 Forecast: U3F
Sample: 1978:1 1995:4

Include observations: 72

Root Mean Squared Error			0.169396
Mean Absolute Error			0.134374
Mean Absolute Percentage Error			12.50374
Theil Inequality Coefficient			0.058019
	Bias Proportion	0.000128	
	Variance Proportion	0.025756	
	Covariance Proportion	0.974116	

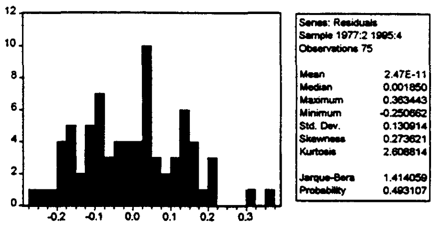


4. FRANCE TO UK:
LS // Dependent Variable is U4
Date: 01/15/98 Time: 11:25
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.231445	0.273423	0.846473	0.4003
IN3	0.106585	0.066111	1.612209	0.1117
D2	0.237007	0.072652	3.262248	0.0018
D3	-0.465489	0.137824	-3.377406	0.0012
D4	0.432039	0.155807	2.772914	0.0072
TREND	0.004877	0.001328	3.672694	0.0005
DM79	-0.095383	0.072079	-1.323307	0.1903
U4(-4)	0.543065	0.105445	5.150218	0.0000
AR(1)	-0.164659	0.126851	-1.298052	0.1988

R-squared	0.894549	Mean dependent var	2.100126
Adjusted R-squared	0.881767	S.D. dependent var	0.403143
S.E. of regression	0.138621	Akaike info criterion	-3.839857
Sum squared resid	1.268241	Schwarz criterion	-3.561759
Log likelihood	46.57425	F-statistic	69.98534
Durbin-Watson stat	1.990611	Prob(F-statistic)	0.000000

Inverted AR Roots -.16



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.244095	Probability	0.301662
Obs*R-squared	5.572540	Probability	0.233426

White Heteroskedasticity Test:

F-statistic	0.869267	Probability	0.565861
Obs*R-squared	8.968581	Probability	0.535088

Estimation Command:

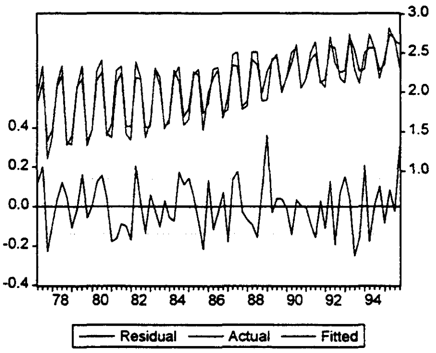
LS U4 C IN3 D2 D3 D4 TREND DM79 U4(-4) AR(1)

Estimation Equation:

U4 = C(1) + C(2)*IN3 + C(3)*D2 + C(4)*D3 + C(5)*D4 + C(6)*TREND + C(7)*DM79 + C(8)*U4(-4) + [AR(1)=C(9)]

Substituted Coefficients:

U4 = 0.23144508 + 0.10658467*IN3 + 0.23700737*D2 - 0.4654892*D3 + 0.43203894*D4 + 0.004877279*TREND - 0.095383107*DM79 + 0.54306539*U4(-4) + [AR(1)=-0.1646592]



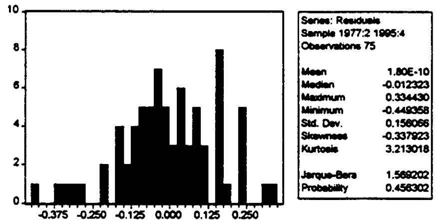
Actual: U4 Forecast: U4F
Sample: 1977:2 1995:4
Include observations: 75

Root Mean Squared Error		0.149615
Mean Absolute Error		0.121554
Mean Absolute Percentage Error		6.079436
Theil Inequality Coefficient		0.035015
Bias Proportion	0.000353	
Variance Proportion	0.047687	
Covariance Proportion	0.951960	

5. JAPAN TO UK:
LS // Dependent Variable is U5
Date: 01/15/98 Time: 12:24
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 13 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.111177	0.684574	-4.544693	0.0000
IN19	0.612199	0.133241	4.594662	0.0000
D2	-0.090520	0.031532	-2.870718	0.0055
D3	-0.062357	0.029138	-2.140036	0.0359
DM91	-0.458471	0.127215	-3.603922	0.0006
U5(-4)	0.474437	0.104747	4.529366	0.0000
AR(1)	0.535757	0.103767	5.163068	0.0000

R-squared	0.931576	Mean dependent var	-0.576426
Adjusted R-squared	0.925538	S.D. dependent var	0.596628
S.E. of regression	0.162806	Akaike info criterion	-3.541708
Sum squared resid	1.802389	Schwarz criterion	-3.325409
Log likelihood	33.39367	F-statistic	154.3002
Durbin-Watson stat	1.891086	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.258320	Probability	0.903532
Obs*R-squared	1.191638	Probability	0.879474

White Heteroskedasticity Test:

F-statistic	1.888864	Probability	0.076524
Obs*R-squared	13.97245	Probability	0.082486

Estimation Command:

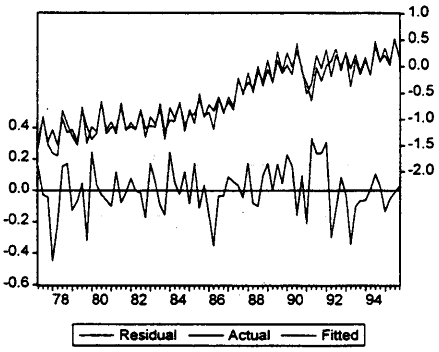
LS U5 C IN19 D2 D3 DM91 U5(-4) AR(1)

Estimation Equation:

U5 = C(1) + C(2)*IN19 + C(3)*D2 + C(4)*D3 + C(5)*DM91 + C(6)*U5(-4) + [AR(1)=C(7)]

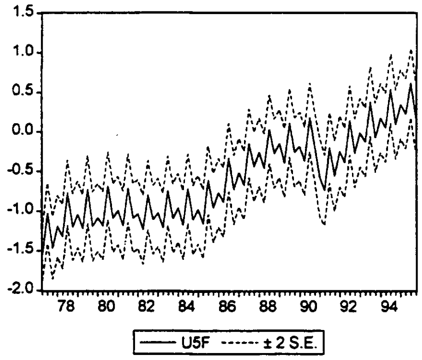
Substituted Coefficients:

U5 = -3.1111773 + 0.61219933*IN19 - 0.090519873*D2 - 0.062357375*D3 - 0.45847116*DM91 + 0.47443668*U5(-4) + [AR(1)=0.53575696]



Actual: U5 Forecast: U5F
Sample: 1977:2 1995:4
Include observations: 75

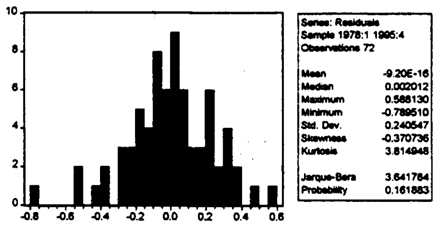
Root Mean Squared Error		0.205839
Mean Absolute Error		0.156721
Mean Absolute Percentage Error		351.9474
Theil Inequality Coefficient		0.127646
Bias Proportion	0.000741	
Variance Proportion	0.098583	
Covariance Proportion	0.900676	



6. FINLAND TO UK:
LS // Dependent Variable is U6
Date: 01/15/98 Time: 12:51
Sample(adjusted): 1978:1 1995:4
Included observations: 72 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.162470	0.828172	-3.818615	0.0003
IN16	0.983351	0.240502	4.088749	0.0001
FF39	-1.803357	0.767934	-2.348324	0.0220
D2	0.456188	0.108895	4.189244	0.0001
D3	-1.034245	0.216550	-4.776005	0.0000
D4	1.156893	0.276601	4.182541	0.0001
TREND	0.004420	0.002571	1.719026	0.0904
U6(-4)	0.171021	0.119478	1.431403	0.1572

R-squared	0.781709	Mean dependent var	1.372654
Adjusted R-squared	0.757833	S.D. dependent var	0.514852
S.E. of regression	0.253361	Akaike info criterion	-2.641440
Sum squared resid	4.108278	Schwarz criterion	-2.388477
Log likelihood	0.928263	F-statistic	32.74088
Durbin-Watson stat	1.938202	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.645251	Probability	0.632385
Obs*R-squared	2.969469	Probability	0.562948

White Heteroskedasticity Test:

F-statistic	1.573142	Probability	0.130298
Obs*R-squared	16.11714	Probability	0.136837

Estimation Command:

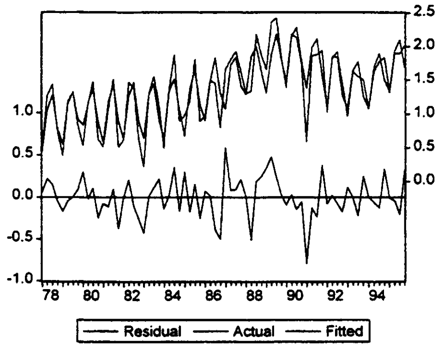
LS U6 C IN16 FF39 D2 D3 D4 TREND U6(-4)

Estimation Equation:

U6 = C(1) + C(2)*IN16 + C(3)*FF39 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*TREND + C(8)*U6(-4)

Substituted Coefficients:

U6 = -3.16247 + 0.98335135*IN16 - 1.803357*FF39 + 0.45618757*D2 - 1.0342455*D3 + 1.1568933*D4 + 0.0044195495*TREND + 0.17102116*U6(-4)



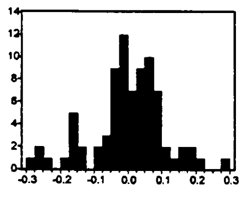
Actual: U6 Forecast: U6F
Sample: 1978:1 1995:4
Include observations: 72

Root Mean Squared Error		0.243623
Mean Absolute Error		0.184708
Mean Absolute Percentage Error		18.94493
Theil Inequality Coefficient		0.083756
Bias Proportion	0.000001	
Variance Proportion	0.068747	
Covariance Proportion	0.931252	

7.SPAIN TO UK:
LS // Dependent Variable is U7
Date: 01/15/98 Time: 13:01
Sample: 1976:1 1995:4
Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.443152	0.269816	-5.348660	0.0000
IN10	0.470315	0.063294	7.430679	0.0000
S29	-0.171806	0.119618	-1.436284	0.1552
D3	-0.684638	0.031361	-21.83067	0.0000
D4	0.824016	0.050508	16.31463	0.0000
DM78	-0.096949	0.065780	-1.473852	0.1448
TREND	0.014380	0.001260	11.40879	0.0000

R-squared	0.948835	Mean dependent var	0.945575
Adjusted R-squared	0.944629	S.D. dependent var	0.479376
S.E. of regression	0.112802	Akaike info criterion	-4.280809
Sum squared resid	0.928874	Schwarz criterion	-4.072382
Log likelihood	64.71729	F-statistic	225.6241
Durbin-Watson stat	1.972131	Prob(F-statistic)	0.000000



Series: Residuals
Sample 1976:1
Observations 80

Mean 1.95E-
Median 0.005355
Maximum 0.290058
Minimum -0.294285
Std. Dev. 0.108434
Skewness -0.390037
Kurtosis

Jarque-Ber3.441809
Probability 0.178904

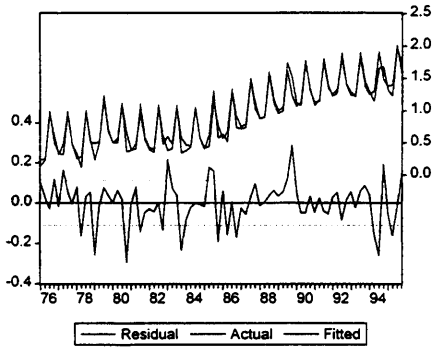
Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.398752	Probability	0.808883

Obs*R-squared	1.807501	Probability	0.771110

White Heteroskedasticity Test:

F-statistic	0.813664	Probability	0.605323
Obs*R-squared	7.576507	Probability	0.577321



Actual: U7 Forecast: U7F
Sample: 1976:1 1995:4
Include observations: 80

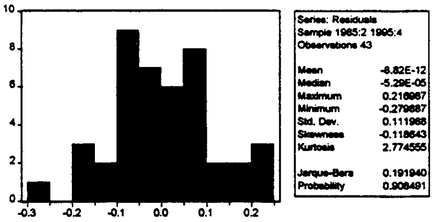
Root Mean Squared Error		0.107754
Mean Absolute Error		0.079708
Mean Absolute Percentage Error		13.55963
Theil Inequality Coefficient		0.051018
Bias Proportion	0.000000	
Variance Proportion	0.013129	
Covariance Proportion	0.986871	

8. IOM TO UK :
LS // Dependent Variable is U8
Date: 01/15/98 Time: 13:17
Sample(adjusted): 1985:2 1995:4
Included observations: 43 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.047692	0.448959	9.015723	0.0000
IN22	0.579632	0.133388	4.345454	0.0001
D2	0.447890	0.047179	9.493312	0.0000
D3	-0.781876	0.087202	-8.966223	0.0000
D4	1.042763	0.120578	8.648018	0.0000
DM90	-0.136134	0.078318	-1.738219	0.0907
AR(1)	0.242251	0.162711	1.488840	0.1452

R-squared	0.748114	Mean dependent var	6.241755
Adjusted R-squared	0.706133	S.D. dependent var	0.223136
S.E. of regression	0.120961	Akaike info criterion	-4.076678
Sum squared resid	0.526734	Schwarz criterion	-3.789971
Log likelihood	33.63422	F-statistic	17.82027
Durbin-Watson stat	1.925373	Prob(F-statistic)	0.000000

Inverted AR Roots .24



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.842064	Probability	0.508893
Obs*R-squared	4.095056	Probability	0.393294

White Heteroskedasticity Test:

F-statistic	0.621925	Probability	0.711444
Obs*R-squared	4.038523	Probability	0.671463

Estimation Command:

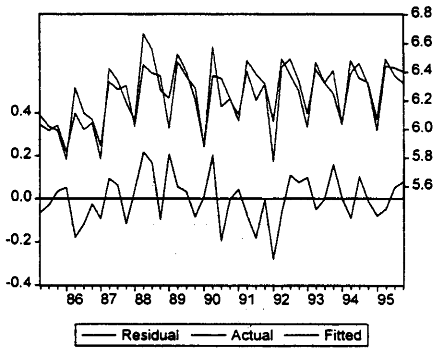
LS U8 C IN22 D2 D3 D4 DM90 AR(1)

Estimation Equation:

U8 = C(1) + C(2)*IN22 + C(3)*D2 + C(4)*D3 + C(5)*D4 + C(6)*DM90 + [AR(1)=C(7)]

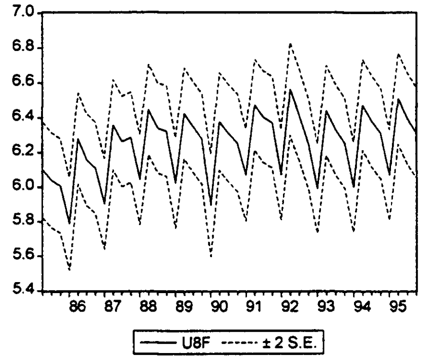
Substituted Coefficients:

U8 = 4.0476923 + 0.57963186*IN22 + 0.44788973*D2 - 0.7818757*D3 + 1.0427627*D4 - 0.13613418*DM90 + [AR(1)=0.24225098]



Actual: U8 Forecast: U8F
Sample: 1985:2 1995:4
Include observations: 43

Root Mean Squared Error	0.114215
Mean Absolute Error	0.092980
Mean Absolute Percentage Error	1.488248
Theil Inequality Coefficient	0.009144
Bias Proportion	0.000032
Variance Proportion	0.091993
Covariance Proportion	0.907975



1.6 TURKEY INBOUND

1. GERMANY TO TURKEY

LS // Dependent Variable is T1
Date: 01/11/98 Time: 18:28
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.298182	1.459028	-0.889758	0.3770
IN4	0.134847	0.299068	0.450891	0.6536
CL21	-0.051296	0.313175	-0.163792	0.8704
EX21	0.365215	0.298562	1.223248	0.2258
FF21	0.946320	0.450047	2.102714	0.0395
S14	-1.324300	0.394851	-3.353924	0.0014
D2	0.613359	0.194380	3.155470	0.0025
D3	-1.340261	0.427761	-3.133200	0.0026
D4	1.688286	0.518586	3.255554	0.0018
DM91	-0.545215	0.130581	-4.175288	0.0001
DM94	-0.283103	0.143847	-1.968077	0.0535
TREND	0.006995	0.019821	0.352883	0.7254
T1(-4)	0.578446	0.126147	4.585474	0.0000

R-squared	0.961943	Mean dependent var	0.265579
Adjusted R-squared	0.954694	S.D. dependent var	1.006988
S.E. of regression	0.214339	Akaike info criterion	-2.925891
Sum squared resid	2.894283	Schwarz criterion	-2.527213
Log likelihood	16.34452	F-statistic	132.7021
Durbin-Watson stat	1.820108	Prob(F-statistic)	0.000000

2. AUSTRIA TO TURKEY

LS // Dependent Variable is T2
Date: 01/14/98 Time: 13:39
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.442106	2.208650	1.558466	0.1241
IN14	-0.656773	0.549880	-1.194392	0.2368
CL22	1.125782	0.276054	4.078119	0.0001
EX22	2.003583	0.470263	4.260556	0.0001
FF22	1.516886	0.789369	1.921644	0.0592
S16	-1.566412	0.354982	-4.412649	0.0000
D2	0.969305	0.161092	6.017074	0.0000
D3	-2.251983	0.340795	-6.608026	0.0000
D4	2.812428	0.432467	6.503215	0.0000

DM79	-0.407585	0.173667	-2.346940	0.0221
DM91	-0.795475	0.163223	-4.873563	0.0000
TREND	0.050612	0.017582	2.878651	0.0054
T2(-4)	0.323474	0.101224	3.195640	0.0022

R-squared	0.917710	Mean dependent var	0.810354
Adjusted R-squared	0.902036	S.D. dependent var	0.893364
S.E. of regression	0.279616	Akaike info criterion	-2.394170
Sum squared resid	4.925658	Schwarz criterion	-1.995492
Log likelihood	-3.860858	F-statistic	58.54884
Durbin-Watson stat	1.636182	Prob(F-statistic)	0.000000

3. FRANCE TO TURKEY

LS // Dependent Variable is T3
Date: 01/14/98 Time: 13:48
Sample(adjusted): 1976:4 1995:4
Included observations: 77 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.197312	2.007965	-0.596281	0.5531
IN3	0.310963	0.391570	0.794144	0.4300
CL23	0.669373	0.269914	2.479947	0.0158
EX23	0.658669	0.334649	1.968238	0.0534
FF23	0.024760	0.423200	0.058507	0.9535
S18	-1.619851	0.444045	-3.647943	0.0005
D2	1.442664	0.097328	14.82266	0.0000
D3	-3.344305	0.177500	-18.84118	0.0000
D4	4.136923	0.321406	12.87131	0.0000
DM78	-0.135201	0.188039	-0.719005	0.4748
DM91	-0.956671	0.163930	-5.835868	0.0000
TREND	0.006955	0.019363	0.359200	0.7206
T3(-3)	0.138380	0.100188	1.381204	0.1720

R-squared	0.904293	Mean dependent var	-0.581202
Adjusted R-squared	0.886348	S.D. dependent var	0.856375
S.E. of regression	0.288703	Akaike info criterion	-2.331973
Sum squared resid	5.334368	Schwarz criterion	-1.936265
Log likelihood	-6.477318	F-statistic	50.39254
Durbin-Watson stat	1.879868	Prob(F-statistic)	0.000000

4. UK TO TURKEY

LS // Dependent Variable is T4
Date: 01/14/98 Time: 13:49
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.318496	1.952625	1.187374	0.2395
IN21	-1.423460	0.520877	-2.732812	0.0081
CL24	-0.373191	0.273116	-1.366417	0.1767
EX24	-0.448709	0.259019	-1.732343	0.0881
FF24	-0.219028	0.589310	-0.371669	0.7114
S20	-1.150691	0.423473	-2.717273	0.0085
D2	0.407691	0.142007	2.870925	0.0056
D3	-0.933659	0.294627	-3.168953	0.0024
D4	1.194084	0.371567	3.213646	0.0021
DM78	-0.003931	0.143462	-0.027398	0.9782
DM91	-0.754448	0.133675	-5.643901	0.0000
TREND	0.000482	0.017719	0.027201	0.9784
T4(-4)	0.765771	0.077864	9.834725	0.0000

R-squared	0.956661	Mean dependent var	-0.522286

Adjusted R-squared	0.948406	S.D. dependent var	1.055298
S.E. of regression	0.239704	Akaike info criterion	-2.702198
Sum squared resid	3.619841	Schwarz criterion	-2.303520
Log likelihood	7.844193	F-statistic	115.8883
Durbin-Watson stat	1.179625	Prob(F-statistic)	0.000000

5. ITALY TO TURKEY

LS // Dependent Variable is T5
Date: 01/14/98 Time: 13:50
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.025597	1.242464	-7.264275	0.0000
IN18	1.691767	0.403663	4.191042	0.0001
CL25	0.125780	0.163955	0.767162	0.4459
EX25	0.491656	0.248256	1.980438	0.0521
FF25	-1.048197	0.596676	-1.756728	0.0839
S22	-0.296469	0.295285	-1.004008	0.3193
D2	1.020050	0.088271	11.55587	0.0000
D3	-3.042898	0.118248	-25.73321	0.0000
D4	3.619004	0.222227	16.28515	0.0000
DM79	-0.193314	0.127708	-1.513719	0.1352
DM91	-0.782141	0.128885	-6.068504	0.0000
TREND	0.051219	0.013433	3.812822	0.0003
T5(-5)	-0.064197	0.103710	-0.619004	0.5382

R-squared	0.949614	Mean dependent var	-1.199923
Adjusted R-squared	0.939862	S.D. dependent var	0.839609
S.E. of regression	0.205898	Akaike info criterion	-3.004438
Sum squared resid	2.628420	Schwarz criterion	-2.602740
Log likelihood	19.24605	F-statistic	97.37533
Durbin-Watson stat	1.596400	Prob(F-statistic)	0.000000

6. USA TO TURKEY

LS // Dependent Variable is T6
Date: 01/14/98 Time: 13:46
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-17.12878	7.116528	-2.406902	0.0191
IN20	3.133993	1.497171	2.093276	0.0404
CL26	0.134176	0.244353	0.549108	0.5849
EX26	0.000552	0.289328	0.001906	0.9985
FF26	0.345189	0.636939	0.541950	0.5898
D2	1.262568	0.112913	11.18182	0.0000
D3	-2.603161	0.273022	-9.534622	0.0000
D4	3.556038	0.332935	10.68087	0.0000
DM80	-0.220451	0.166013	-1.327918	0.1891
DM91	-0.770679	0.173726	-4.436177	0.0000
TREND	-0.031140	0.018233	-1.707928	0.0927
T6(-6)	-0.141970	0.111001	-1.278995	0.2057

R-squared	0.855865	Mean dependent var	-1.927209
Adjusted R-squared	0.830292	S.D. dependent var	0.694112
S.E. of regression	0.285944	Akaike info criterion	-2.356526
Sum squared resid	5.069359	Schwarz criterion	-1.982894
Log likelihood	-5.809974	F-statistic	33.46826
Durbin-Watson stat	0.842359	Prob(F-statistic)	0.000000

7. N.CYPRUS TO TURKEY

LS // Dependent Variable is T7
Date: 01/14/98 Time: 13:53
Sample(adjusted): 1987:4 1995:4
Included observations: 33 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.593310	1.484754	-2.420138	0.0247
IN23	0.295213	0.321528	0.918158	0.3690
CL27	-0.039818	0.359376	-0.110797	0.9128
EX15	0.515693	0.187693	2.747531	0.0121
FF27	-0.087018	0.178202	-0.488310	0.6304
D2	0.216775	0.109349	1.982423	0.0607
D3	-1.226143	0.146278	-8.382255	0.0000
D4	1.622966	0.207697	7.814124	0.0000
DM90	-0.046558	0.086226	-0.539955	0.5949
DM91	-0.343678	0.084990	-4.043732	0.0006
TREND	-0.053672	0.021097	-2.544018	0.0189
T7(-7)	0.223545	0.171178	1.305920	0.2057

R-squared	0.957267	Mean dependent var	-2.481509
Adjusted R-squared	0.934883	S.D. dependent var	0.379817
S.E. of regression	0.096922	Akaike info criterion	-4.392414
Sum squared resid	0.197270	Schwarz criterion	-3.848230
Log likelihood	37.64987	F-statistic	42.76584
Durbin-Watson stat	1.739591	Prob(F-statistic)	0.000000

8. ISRAEL TO TURKEY

LS // Dependent Variable is T8
Date: 01/14/98 Time: 13:54
Sample(adjusted): 1987:1 1995:4
Included observations: 36 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-65.60094	24.26110	-2.703955	0.0124
IN17	-1.120534	2.726170	-0.411029	0.6847
CL28	-6.134227	2.448088	-2.505722	0.0194
EX28	-4.211565	2.332233	-1.805808	0.0835
FF28	-1.804450	2.419719	-0.745727	0.4631
D2	1.157486	0.336194	3.442908	0.0021
D3	-3.680062	0.879929	-4.182228	0.0003
D4	4.793413	1.149304	4.170711	0.0003
DM90	0.891779	0.406526	2.193658	0.0382
DM95	1.732159	0.724371	2.391261	0.0250
TREND	-0.056041	0.102619	-0.546110	0.5900
T8(-4)	-0.197332	0.252652	-0.781042	0.4424

R-squared	0.931977	Mean dependent var	0.835127
Adjusted R-squared	0.900800	S.D. dependent var	1.320982
S.E. of regression	0.416057	Akaike info criterion	-1.492664
Sum squared resid	4.154486	Schwarz criterion	-0.964824
Log likelihood	-12.21384	F-statistic	29.89292
Durbin-Watson stat	1.371813	Prob(F-statistic)	0.000000

9. DENMARK TO TURKEY

LS // Dependent Variable is T9
Date: 01/14/98 Time: 13:56
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	-4.197675	3.142543	-1.335757	0.1864
IN2	0.867773	0.510646	1.699364	0.0942
CL29	0.184105	0.470865	0.390992	0.6971
EX29	-0.222724	0.532936	-0.417919	0.6774
FF29	-0.614385	0.841676	-0.729955	0.4681
S23	0.031271	0.347522	0.089981	0.9286
D2	0.875821	0.203110	4.312051	0.0001
D3	-2.120356	0.445953	-4.754663	0.0000
D4	2.506836	0.559207	4.482839	0.0000
DM78	-0.488115	0.229667	-2.125318	0.0375
DM91	-0.416670	0.215842	-1.930436	0.0581
TREND	-0.006925	0.033058	-0.209489	0.8347
T9(-4)	0.406134	0.123309	3.293640	0.0016

R-squared	0.915822	Mean dependent var	-0.351260
Adjusted R-squared	0.899788	S.D. dependent var	1.160688
S.E. of regression	0.367430	Akaike info criterion	-1.847938
Sum squared resid	8.505307	Schwarz criterion	-1.449260
Log likelihood	-24.61769	F-statistic	57.11800
Durbin-Watson stat	1.392007	Prob(F-statistic)	0.000000

10. SWITZERLAND TO TURKEY

LS // Dependent Variable is T10
Date: 01/11/98 Time: 18:26
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.593125	3.051191	1.505355	0.1372
IN11	-0.244065	0.681443	-0.358159	0.7214
CL30	0.654773	0.274291	2.387145	0.0200
EX30	1.758384	0.509964	3.448057	0.0010
FF30	1.388196	0.731570	1.897556	0.0623
S24	-1.885677	0.577167	-3.267123	0.0018
D2	0.745238	0.167014	4.462130	0.0000
D3	-1.738911	0.357398	-4.865470	0.0000
D4	2.377400	0.458639	5.183600	0.0000
DM84	-0.353696	0.191286	-1.849043	0.0691
DM91	-0.774376	0.173212	-4.470690	0.0000
TREND	0.055479	0.029861	1.857925	0.0679
T10(-4)	0.461866	0.102485	4.506680	0.0000

R-squared	0.882804	Mean dependent var	0.278565
Adjusted R-squared	0.860481	S.D. dependent var	0.825413
S.E. of regression	0.308310	Akaike info criterion	-2.198789
Sum squared resid	5.988486	Schwarz criterion	-1.800111
Log likelihood	-11.28533	F-statistic	39.54675
Durbin-Watson stat	1.337778	Prob(F-statistic)	0.000000

11. GREECE TO TURKEY

LS // Dependent Variable is T11
Date: 01/14/98 Time: 13:58
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.545608	1.406992	-2.519992	0.0143
IN5	0.049133	0.228235	0.215272	0.8303
CL31	-0.993744	0.273008	-3.639986	0.0006
EX31	-0.907817	0.290615	-3.123775	0.0027
FF31	0.792008	0.279253	2.836164	0.0061
S25	-0.512612	0.197006	-2.602017	0.0115

D2	0.333010	0.103350	3.222164	0.0020
D3	-0.954792	0.206057	-4.633625	0.0000
D4	1.390635	0.306789	4.532866	0.0000
DM78	-0.120538	0.166892	-0.722252	0.4728
DM91	-0.292474	0.157060	-1.862177	0.0672
TREND	-0.007892	0.018079	-0.436505	0.6640
T11(-4)	0.207709	0.113762	1.825831	0.0726

R-squared	0.834530	Mean dependent var	1.195728
Adjusted R-squared	0.803012	S.D. dependent var	0.627023
S.E. of regression	0.278293	Akaike info criterion	-2.403651
Sum squared resid	4.879177	Schwarz criterion	-2.004973
Log likelihood	-3.500570	F-statistic	26.47785
Durbin-Watson stat	1.003513	Prob(F-statistic)	0.000000

12. BELGIUM TO TURKEY

LS // Dependent Variable is T12
Date: 01/14/98 Time: 14:00
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.983881	2.216027	1.346501	0.1830
IN1	0.237338	0.391132	0.606798	0.5462
CL32	1.654159	0.366408	4.514524	0.0000
EX32	0.832118	0.496882	1.674680	0.0990
FF32	-0.629840	0.637721	-0.987643	0.3271
S26	-1.245294	0.253672	-4.909074	0.0000
D2	1.219876	0.176116	6.926543	0.0000
D3	-3.099520	0.429353	-7.219047	0.0000
D4	3.618209	0.511144	7.078656	0.0000
DM80	-0.323097	0.194582	-1.660462	0.1018
DM91	-0.569832	0.166670	-3.418919	0.0011
TREND	-0.023516	0.023260	-1.011001	0.3159
T12(-4)	0.072416	0.111214	0.651137	0.5173

R-squared	0.938794	Mean dependent var	-0.564963
Adjusted R-squared	0.927136	S.D. dependent var	1.053291
S.E. of regression	0.284318	Akaike info criterion	-2.360816
Sum squared resid	5.092719	Schwarz criterion	-1.962138
Log likelihood	-5.128313	F-statistic	80.52642
Durbin-Watson stat	1.753263	Prob(F-statistic)	0.000000

13. THE NETHERLANDS TO TURKEY

LS // Dependent Variable is T13
Date: 01/14/98 Time: 14:02
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.308854	1.503345	0.205444	0.8379
IN9	0.129305	0.223204	0.579313	0.5644
CL33	0.508446	0.375999	1.352254	0.1811
EX33	0.883569	0.267493	3.303143	0.0016
FF33	0.396006	0.167564	2.363313	0.0212
S27	-1.208031	0.221827	-5.445826	0.0000
D2	0.663004	0.165777	3.999385	0.0002
D3	-1.581611	0.364952	-4.333750	0.0001
D4	1.950181	0.456473	4.272282	0.0001
DM78	-0.185464	0.165639	-1.119686	0.2671
DM91	-0.422864	0.145133	-2.913637	0.0049
TREND	0.029108	0.025170	1.156465	0.2519

T13(-4)	0.533606	0.097321	5.482924	0.0000

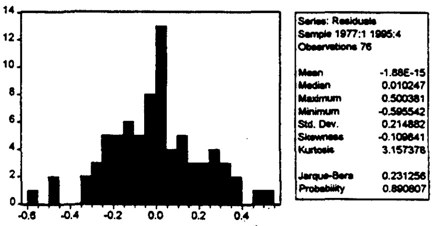
R-squared	0.955260	Mean dependent var	-0.300935
Adjusted R-squared	0.946738	S.D. dependent var	1.102953
S.E. of regression	0.254546	Akaike info criterion	-2.582038
Sum squared resid	4.082014	Schwarz criterion	-2.183360
Log likelihood	3.278102	F-statistic	112.0937
Durbin-Watson stat	1.948214	Prob(F-statistic)	0.000000

1. Germany to Turkey

LS // Dependent Variable is T1
Date: 12/13/97 Time: 18:55
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.547691	1.205287	-2.943442	0.0045
IN4	0.664426	0.251502	2.641835	0.0103
S14	-0.998918	0.260279	-3.837881	0.0003
DM91	-0.482514	0.124666	-3.870450	0.0002
D2	0.700799	0.183513	3.818805	0.0003
D3	-1.573040	0.396069	-3.971628	0.0002
D4	1.925078	0.483364	3.982663	0.0002
TREND	0.008679	0.002493	3.481619	0.0009
T1(-4)	0.513703	0.113736	4.516624	0.0000

R-squared	0.954464	Mean dependent var	0.265579
Adjusted R-squared	0.949027	S.D. dependent var	1.006988
S.E. of regression	0.227349	Akaike info criterion	-2.851732
Sum squared resid	3.463082	Schwarz criterion	-2.575724
Log likelihood	9.526504	F-statistic	175.5463
Durbin-Watson stat	1.475719	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.412631	Probability	0.058196
Obs*R-squared	10.09545	Probability	0.038850

White Heteroskedasticity Test:

F-statistic	2.310487	Probability	0.016241
Obs*R-squared	23.22562	Probability	0.025870

Ramsey RESET Test:

F-statistic	0.916647	Probability	0.341851
Log likelihood ratio	1.048270	Probability	0.305906

Estimation Command:

LS T1 C IN4 S14 DM91 D2 D3 D4 TREND T1(-4)

Estimation Equation:

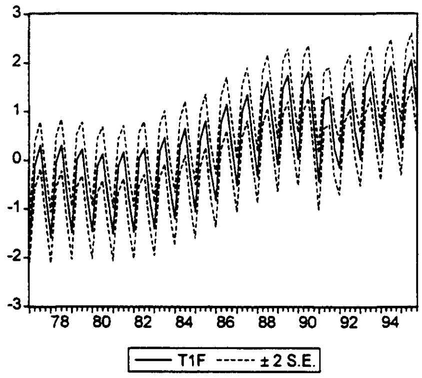
T1 = C(1) + C(2)*IN4 + C(3)*S14 + C(4)*DM91 + C(5)*D2 + C(6)*D3 + C(7)*D4 + C(8)*TREND + C(9)*T1(-4)

Substituted Coefficients:

T1 = -3.5476914 + 0.66442625*IN4 - 0.99891839*S14 - 0.48251439*DM91 + 0.70079897*D2 - 1.5730396*D3 + 1.9250776*D4 + 0.0086786781*TREND + 0.51370278*T1(-4)

Actual: T1 Forecast: T1F
Sample: 1977:1 1995:4
Include observations: 76

Root Mean Squared Error		0.218920
Mean Absolute Error		0.171363
Mean Absolute Percentage Error		56.28781
Theil Inequality Coefficient		0.106846
Bias Proportion	0.000782	
Variance Proportion	0.011502	
Covariance Proportion	0.987715	



2. Austria to Turkey
LS // Dependent Variable is T2
Date: 12/14/97 Time: 10:04
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 8 iterations

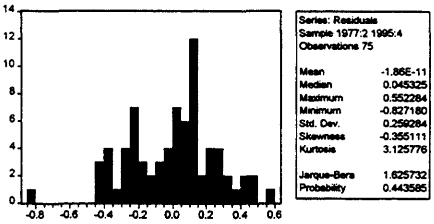
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.253851	0.912227	-4.663150	0.0000
IN14	0.911588	0.201980	4.513248	0.0000
S16	-1.298269	0.316498	-4.101982	0.0001
D2	0.770065	0.143908	5.351082	0.0000
D3	-1.759348	0.308606	-5.700946	0.0000
D4	2.127594	0.379896	5.600460	0.0000
DM91	-0.679080	0.194015	-3.500143	0.0008
DM94	-0.422319	0.196579	-2.148344	0.0354
T2(-4)	0.417989	0.094053	4.444191	0.0000
AR(1)	0.358329	0.113929	3.145190	0.0025

R-squared	0.915940	Mean dependent var	0.821237
Adjusted R-squared	0.904300	S.D. dependent var	0.894293
S.E. of regression	0.276653	Akaike info criterion	-2.446418
Sum squared resid	4.974890	Schwarz criterion	-2.137420
Log likelihood	-4.679705	F-statistic	78.69478
Durbin-Watson stat	2.077251	Prob(F-statistic)	0.000000

Inverted AR Roots .36

Omitted Variables: EX22 CL22 FF22

F-statistic	0.692585	Probability	0.560042
Log likelihood ratio	2.472218	Probability	0.480333



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.458411	Probability	0.225919
Obs*R-squared	6.546453	Probability	0.161887

White Heteroskedasticity Test:

F-statistic	0.485304	Probability	0.905610
Obs*R-squared	5.858725	Probability	0.882622

Ramsey RESET Test:

F-statistic	2.325867	Probability	0.132166
Log likelihood ratio	2.677267	Probability	0.101790

Estimation Command:

LS T2 C IN14 S16 D2 D3 D4 DM91 DM94 T2(-4) AR(1)

Estimation Equation:

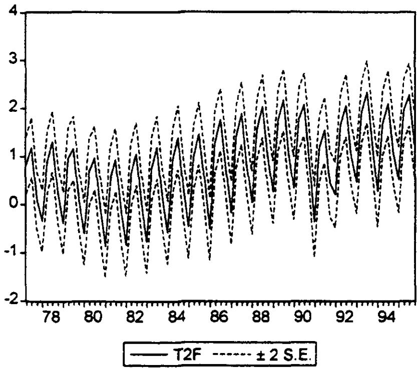
T2 = C(1) + C(2)*IN14 + C(3)*S16 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM91 + C(8)*DM94 + C(9)*T2(-4) + [AR(1)=C(10)]

Substituted Coefficients:

T2 = -4.2538513 + 0.91158787*IN14 - 1.2982694*S16 + 0.77006525*D2 - 1.7593477*D3 + 2.1275936*D4 - 0.67908007*DM91 - 0.42231937*DM94 + 0.41798933*T2(-4) + [AR(1)=0.35832907]

Actual: T2 Forecast: T2F
Sample: 1977:2 1995:4
Include observations: 75

Root Mean Squared Error		0.304159
Mean Absolute Error		0.239046
Mean Absolute Percentage Error		313.9619
Theil Inequality Coefficient		0.127898
Bias Proportion	0.000002	
Variance Proportion	0.034855	
Covariance Proportion	0.965143	

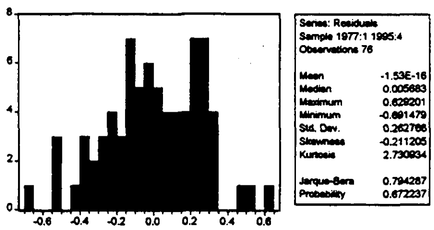


3. France to Turkey:

LS // Dependent Variable is T3
Date: 12/14/97 Time: 11:13
Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.185074	0.866503	-4.829845	0.0000
IN3	0.736955	0.178680	4.124438	0.0001
S18	-1.442570	0.219652	-6.567520	0.0000
D2	0.898258	0.169920	5.286344	0.0000
D3	-2.040369	0.361894	-5.638036	0.0000
D4	2.384746	0.441900	5.396579	0.0000
DM91	-0.969708	0.147561	-6.571582	0.0000
T3(-4)	0.375898	0.095015	3.956180	0.0002

R-squared	0.906846	Mean dependent var	-0.576193
Adjusted R-squared	0.897256	S.D. dependent var	0.860929
S.E. of regression	0.275959	Akaike info criterion	-2.475702
Sum squared resid	5.178444	Schwarz criterion	-2.230362
Log likelihood	-5.762637	F-statistic	94.56719
Durbin-Watson stat	1.497764	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.250899	Probability	0.298575
Obs*R-squared	5.510918	Probability	0.238771

White Heteroskedasticity Test:

F-statistic	1.485017	Probability	0.165302
Obs*R-squared	14.13413	Probability	0.166961

Ramsey RESET Test:

F-statistic	0.098881	Probability	0.754154
Log likelihood ratio	0.112081	Probability	0.737788

Estimation Command:

LS T3 C IN3 S18 D2 D3 D4 DM91 T3(-4)

Estimation Equation:

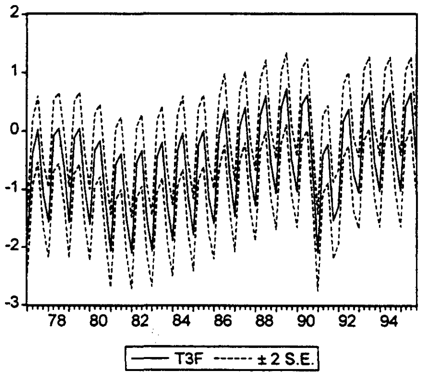
T3 = C(1) + C(2)*IN3 + C(3)*S18 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM91 + C(8)*T3(-4)

Substituted Coefficients:

T3 = -4.1850738 + 0.73695518*IN3 - 1.4425699*S18 + 0.89825823*D2 - 2.0403691*D3 + 2.384746*D4 - 0.96970791*DM91 + 0.37589795*T3(-4)

Actual: T3 Forecast: T3F
Sample: 1977:1 1995:4
Include observations: 76

Root Mean Squared Error		0.277665
Mean Absolute Error		0.232911
Mean Absolute Percentage Error		70.19032
Theil Inequality Coefficient		0.138031
Bias Proportion	0.000075	
Variance Proportion	0.047191	
Covariance Proportion	0.952733	



4. UK to Turkey:

LS // Dependent Variable is T4
Date: 12/17/97 Time: 17:15
Sample: 1976:1 1995:4
Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.922742	2.683840	-2.206816	0.0303
IN21	1.426352	0.711214	2.005517	0.0484

R-squared	0.049037	Mean dependent var	-0.545090
Adjusted R-squared	0.036845	S.D. dependent var	1.036636
S.E. of regression	1.017360	Akaike info criterion	0.059104
Sum squared resid	80.73162	Schwarz criterion	0.118654
Log likelihood	-113.8792	F-statistic	4.022099
Durbin-Watson stat	1.222863	Prob(F-statistic)	0.048376

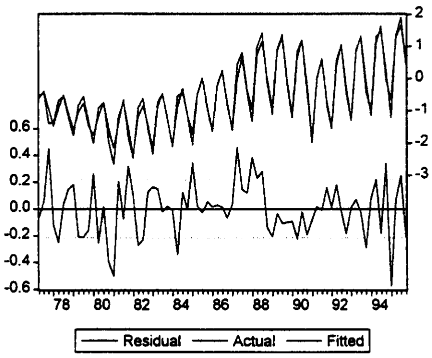
LS // Dependent Variable is T4
Date: 12/14/97 Time: 21:51
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints

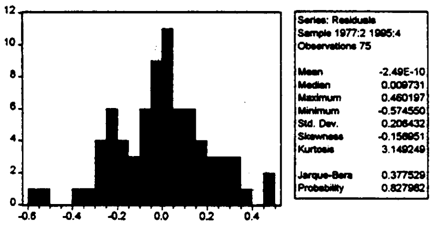
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.855622	0.225942	-3.786917	0.0003
D2	0.453112	0.115889	3.909870	0.0002
D3	-1.019476	0.253877	-4.015620	0.0002
D4	1.292139	0.318818	4.052906	0.0001
DM91	-0.682172	0.160019	-4.263065	0.0001
T4(-4)	0.761672	0.070296	10.83517	0.0000
TREND	0.011498	0.002914	3.946223	0.0002
AR(1)	0.491734	0.101687	4.835743	0.0000

R-squared	0.962064	Mean dependent var	-0.513925
Adjusted R-squared	0.958101	S.D. dependent var	1.059868
S.E. of regression	0.216948	Akaike info criterion	-2.955659
Sum squared resid	3.153447	Schwarz criterion	-2.708460
Log likelihood	12.41681	F-statistic	242.7337
Durbin-Watson stat	1.969418	Prob(F-statistic)	0.000000

Inverted AR Roots .49





Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.332059	Probability	0.855394
Obs*R-squared	1.548585	Probability	0.818002

White Heteroskedasticity Test:

F-statistic	1.060484	Probability	0.401357
Obs*R-squared	8.542662	Probability	0.382331

Ramsey RESET Test:

F-statistic	6.901131	Probability	0.010700
Log likelihood ratio	7.458706	Probability	0.006313

Estimation Command:

LS T4 C D2 D3 D4 DM91 T4(-4) TREND AR(1)

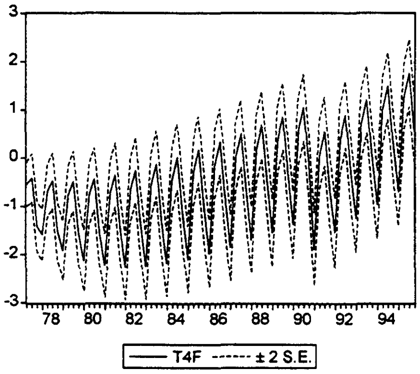
Estimation Equation:

T4 = C(1) + C(2)*D2 + C(3)*D3 + C(4)*D4 + C(5)*DM91 + C(6)*T4(-4) + C(7)*TREND + [AR(1)=C(8)]

Substituted Coefficients:

T4 = -0.85562189 + 0.45311176*D2 - 1.0194755*D3 + 1.2921392*D4 - 0.6821718*DM91 + 0.76167249*T4(-4) + 0.011497942*TREND + [AR(1)=0.4917336]
Actual: T4 Forecast: T4F
Sample: 1977:2 1995:4
Include observations: 75

Root Mean Squared Error		0.308064
Mean Absolute Error		0.241199
Mean Absolute Percentage Error		147.5479
Theil Inequality Coefficient		0.133610
Bias Proportion	0.005216	
Variance Proportion	0.029989	
Covariance Proportion	0.964796	



5. Italy to Turkey:

LS // Dependent Variable is T5
Date: 12/14/97 Time: 15:49
Sample(adjusted): 1976:2 1995:4
Included observations: 79 after adjusting endpoints
Convergence achieved after 7 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.894709	1.310791	-6.022858	0.0000
IN18	1.469535	0.342121	4.295364	0.0001
CL25	-0.159645	0.087076	-1.833394	0.0711
FF25	-0.964218	0.440388	-2.189476	0.0320
DM82	-0.316115	0.131725	-2.399808	0.0191
DM91	-0.718765	0.135169	-5.317532	0.0000
D2	1.037178	0.052866	19.61910	0.0000
D3	-3.020828	0.098443	-30.68598	0.0000
D4	3.503697	0.135953	25.77143	0.0000
TREND	0.025690	0.006984	3.678544	0.0005
AR(1)	0.332954	0.114050	2.919363	0.0048

R-squared	0.953473	Mean dependent var	-1.208671
Adjusted R-squared	0.946631	S.D. dependent var	0.833942
S.E. of regression	0.192656	Akaike info criterion	-3.165159
Sum squared resid	2.523907	Schwarz criterion	-2.835236
Log likelihood	23.92764	F-statistic	139.3511
Durbin-Watson stat	2.113687	Prob(F-statistic)	0.000000

Inverted AR Roots .33

LS // Dependent Variable is T5

Date: 12/14/97 Time: 16:13
Sample(adjusted): 1976:2 1995:4
Included observations: 79 after adjusting endpoints
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.299321	1.022087	-7.141582	0.0000
IN18	1.295552	0.314997	4.112909	0.0001
EX25	0.244958	0.130047	1.883616	0.0639
FF25	-0.853457	0.438562	-1.946034	0.0558
DM82	-0.318424	0.128911	-2.470112	0.0160
DM91	-0.747961	0.134859	-5.546234	0.0000
D2	1.038995	0.054178	19.17738	0.0000
D3	-3.020732	0.100217	-30.14185	0.0000
D4	3.497465	0.138578	25.23826	0.0000
TREND	0.036352	0.012187	2.982758	0.0040
AR(1)	0.288761	0.116501	2.478620	0.0157

R-squared	0.953245	Mean dependent var	-1.208671
Adjusted R-squared	0.946369	S.D. dependent var	0.833942
S.E. of regression	0.193128	Akaike info criterion	-3.160267
Sum squared resid	2.536283	Schwarz criterion	-2.830344
Log likelihood	23.73441	F-statistic	138.6379
Durbin-Watson stat	2.096527	Prob(F-statistic)	0.000000

Inverted AR Roots .29

LS // Dependent Variable is T5
Date: 12/14/97 Time: 16:08
Sample(adjusted): 1976:2 1995:4
Included observations: 79 after adjusting endpoints
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.101461	0.955549	-7.431812	0.0000
IN18	0.965588	0.181635	5.316102	0.0000
EX25	0.251905	0.127816	1.970848	0.0528
S22	-0.405968	0.210225	-1.931112	0.0576
DM82	-0.325436	0.127451	-2.553432	0.0129
DM91	-0.765696	0.132219	-5.791129	0.0000
D2	1.042926	0.054454	19.15246	0.0000
D3	-3.028443	0.100682	-30.07936	0.0000
D4	3.528260	0.138641	25.44891	0.0000
TREND	0.032943	0.012267	2.685509	0.0091
AR(1)	0.275363	0.117955	2.334478	0.0225

R-squared	0.953091	Mean dependent var	-1.208671
Adjusted R-squared	0.946193	S.D. dependent var	0.833942
S.E. of regression	0.193444	Akaike info criterion	-3.156993
Sum squared resid	2.544600	Schwarz criterion	-2.827070
Log likelihood	23.60509	F-statistic	138.1625
Durbin-Watson stat	2.050829	Prob(F-statistic)	0.000000

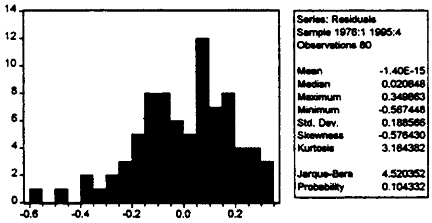
Inverted AR Roots .28

LS // Dependent Variable is T5
Date: 12/14/97 Time: 16:24
Sample: 1976:1 1995:4
Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	-7.519716	0.750935	-10.01381	0.0000
IN18	1.072574	0.141900	7.558649	0.0000
EX25	0.251890	0.098953	2.545545	0.0131
S22	-0.531182	0.175765	-3.022112	0.0035
DM82	-0.307966	0.110110	-2.796901	0.0067
DM91	-0.810139	0.114055	-7.103056	0.0000
D2	1.031828	0.063402	16.27434	0.0000
D3	-3.005897	0.109769	-27.38395	0.0000
D4	3.493584	0.155350	22.48844	0.0000
TREND	0.032433	0.009418	3.443598	0.0010

R-squared	0.949056	Mean dependent var	-1.220562
Adjusted R-squared	0.942507	S.D. dependent var	0.835445
S.E. of regression	0.200321	Akaike info criterion	-3.099198
Sum squared resid	2.809001	Schwarz criterion	-2.801444
Log likelihood	20.45283	F-statistic	144.8966
Durbin-Watson stat	1.486705	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.965254	Probability	0.110061
Obs*R-squared	8.514389	Probability	0.074452

White Heteroskedasticity Test:

F-statistic	1.339906	Probability	0.213434
Obs*R-squared	16.70490	Probability	0.213148

Ramsey RESET Test:

F-statistic	0.204075	Probability	0.652868
Log likelihood ratio	0.236259	Probability	0.626921

Estimation Command:

LS T5 C IN18 EX25 S22 DM82 DM91 D2 D3 D4 TREND

Estimation Equation:

T5 = C(1) + C(2)*IN18 + C(3)*EX25 + C(4)*S22 + C(5)*DM82 + C(6)*DM91 + C(7)*D2 + C(8)*D3 + C(9)*D4 + C(10)*TREND

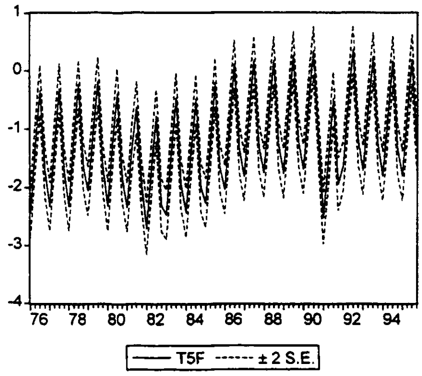
Substituted Coefficients:

T5 = -7.5197164 + 1.0725745*IN18 + 0.25188976*EX25 - 0.53118157*S22 - 0.30796566*DM82 - 0.81013853*DM91 + 1.0318276*D2 - 3.0058967*D3 + 3.493584*D4 + 0.03243266*TREND

Actual: T5 Forecast: T5F
Sample: 1976:1 1995:4
Include observations: 80

Root Mean Squared Error	0.187383
Mean Absolute Error	0.151662
Mean Absolute Percentage Error	46.03014
Theil Inequality Coefficient	0.063728

Bias Proportion 0.000000
Variance Proportion 0.013071
Covariance Proportion 0.986929



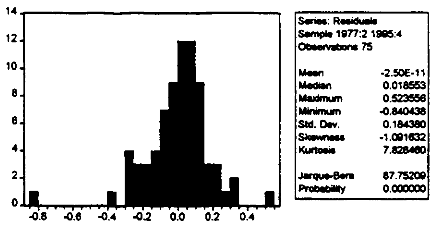
6. USA TO TURKEY:

LS // Dependent Variable is T6
Date: 12/14/97 Time: 16:54
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.766439	2.663113	-3.667302	0.0005
IN20	1.775354	0.582004	3.050417	0.0033
D2	0.926342	0.135392	6.841913	0.0000
D3	-1.985889	0.286085	-6.941599	0.0000
D4	2.646329	0.382180	6.924307	0.0000
DM86	-0.515081	0.142066	-3.625649	0.0006
DM91	-0.875118	0.149626	-5.848695	0.0000
T6(-4)	0.311019	0.096129	3.235440	0.0019
AR(1)	0.511053	0.108969	4.689905	0.0000

R-squared	0.928913	Mean dependent var	-1.920935
Adjusted R-squared	0.920297	S.D. dependent var	0.691544
S.E. of regression	0.195235	Akaike info criterion	-3.154932
Sum squared resid	2.515713	Schwarz criterion	-2.876833
Log likelihood	20.88956	F-statistic	107.8052
Durbin-Watson stat	2.234945	Prob(F-statistic)	0.000000

Inverted AR Roots .51



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.096698	Probability	0.091925
Obs*R-squared	8.936468	Probability	0.062707

White Heteroskedasticity Test:

F-statistic	5.379753	Probability	0.000017
Obs*R-squared	32.01732	Probability	0.000198

Ramsey RESET Test:

F-statistic	5.069703	Probability	0.027734
Log likelihood ratio	5.632743	Probability	0.017628

Estimation Command:

LS T6 C IN20 D2 D3 D4 DM86 DM91 T6(-4) AR(1)

Estimation Equation:

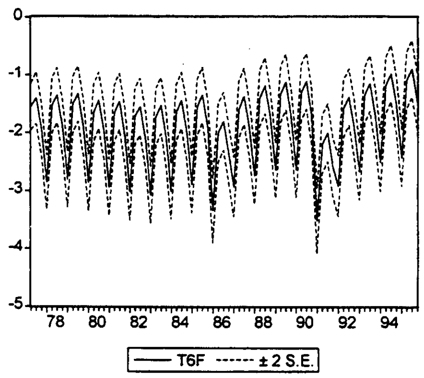
T6 = C(1) + C(2)*IN20 + C(3)*D2 + C(4)*D3 + C(5)*D4 + C(6)*DM86 + C(7)*DM91 + C(8)*T6(-4) + [AR(1)=C(9)]

Substituted Coefficients:

T6 = -9.766439 + 1.7753542*IN20 + 0.92634173*D2 - 1.985889*D3 + 2.6463295*D4 - 0.51508091*DM86 - 0.87511784*DM91 + 0.31101851*T6(-4) + [AR(1)=0.51105344]

Actual: T6 Forecast: T6F
Sample: 1977:2 1995:4
Include observations: 75

Root Mean Squared Error		0.230503
Mean Absolute Error		0.174086
Mean Absolute Percentage Error		9.959574
Theil Inequality Coefficient		0.056744
Bias Proportion	0.000003	
Variance Proportion	0.055034	
Covariance Proportion	0.944963	

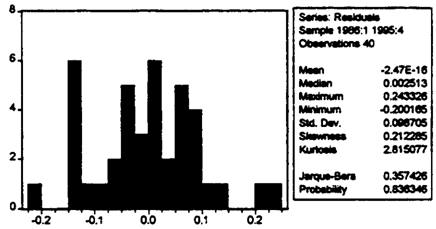


7. NORTH CYPRUS TO TURKEY:
LS // Dependent Variable is T7
Date: 12/14/97 Time: 17:10
Sample(adjusted): 1986:1 1995:4
Included observations: 40 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.584612	0.229895	-19.94222	0.0000
IN23	0.418488	0.116867	3.580884	0.0012
EX15	0.377128	0.104343	3.614303	0.0011
FF27	-0.366003	0.149204	-2.453038	0.0200
D2	0.315558	0.054657	5.773460	0.0000

D3	-1.222394	0.111742	-10.93942	0.0000
D4	1.482942	0.182482	8.126518	0.0000
DM91	-0.233332	0.069099	-3.376750	0.0020
TREND	-0.032145	0.012276	-2.618486	0.0135

R-squared	0.933332	Mean dependent var	-2.523574
Adjusted R-squared	0.916127	S.D. dependent var	0.382280
S.E. of regression	0.110711	Akaike info criterion	-4.206549
Sum squared resid	0.379968	Schwarz criterion	-3.826551
Log likelihood	36.37344	F-statistic	54.24874
Durbin-Watson stat	1.442006	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.782338	Probability	0.546577
Obs*R-squared	4.154557	Probability	0.385493

White Heteroskedasticity Test:

F-statistic	0.539830	Probability	0.869094
Obs*R-squared	7.739972	Probability	0.805106

Ramsey RESET Test:

F-statistic	0.020055	Probability	0.888331
Log likelihood ratio	0.026731	Probability	0.870128

Estimation Command:

LS T7 C IN23 EX15 FF27 D2 D3 D4 DM91 TREND

Estimation Equation:

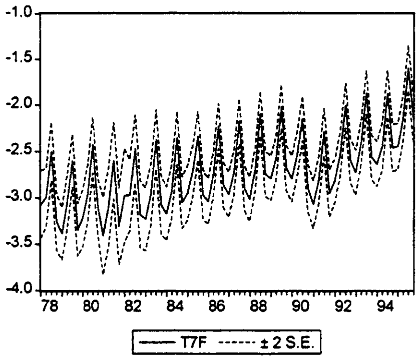
T7 = C(1) + C(2)*IN23 + C(3)*EX15 + C(4)*FF27 + C(5)*D2 + C(6)*D3 + C(7)*D4 + C(8)*DM91 + C(9)*TREND

Substituted Coefficients:

T7 = -4.584612 + 0.41848831*IN23 + 0.37712784*EX15 - 0.36600319*FF27 + 0.31555838*D2 - 1.2223941*D3 + 1.4829421*D4 - 0.2333315

Actual: T7 Forecast: T7F
Sample: 1978:1 1995:4
Include observations: 40

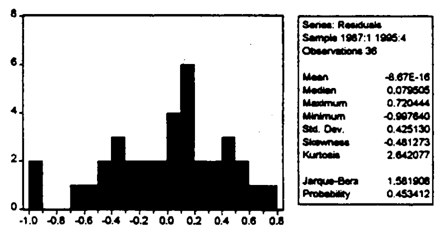
Root Mean Squared Error	0.097464
Mean Absolute Error	0.077358
Mean Absolute Percentage Error	3.118471
Theil Inequality Coefficient	0.019105
Bias Proportion	0.000000
Variance Proportion	0.017247
Covariance Proportion	0.982753



8. ISRAEL TO TURKEY:
LS // Dependent Variable is T8
Date: 12/14/97 Time: 17:30
Sample(adjusted): 1987:1 1995:4
Included observations: 36 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-15.38763	6.387258	-2.409113	0.0228
CL28	-1.546757	0.859759	-1.799059	0.0828
FF28	-1.869939	0.640933	-2.917524	0.0069
D2	0.519481	0.298252	1.741753	0.0925
D3	-1.719230	0.730226	-2.354382	0.0258
D4	2.142083	0.930617	2.301788	0.0290
DM91	-0.656889	0.256499	-2.560985	0.0161
T8(-4)	0.390179	0.187647	2.079321	0.0469

R-squared	0.896426	Mean dependent var	0.835127
Adjusted R-squared	0.870533	S.D. dependent var	1.320982
S.E. of regression	0.475309	Akaike info criterion	-1.294449
Sum squared resid	6.325731	Schwarz criterion	-0.942556
Log likelihood	-19.78171	F-statistic	34.61990
Durbin-Watson stat	1.487285	Prob(F-statistic)	0.000000



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.687345	Probability	0.607765
Obs*R-squared	3.700185	Probability	0.448099

White Heteroskedasticity Test:

F-statistic	0.752046	Probability	0.671020
Obs*R-squared	8.325118	Probability	0.597113

Ramsey RESET Test:

F-statistic	0.001692	Probability	0.967488
Log likelihood ratio	0.002256	Probability	0.962113

Estimation Command:

LS T8 C CL28 FF28 D2 D3 D4 DM91 T8(-4)

Estimation Equation:

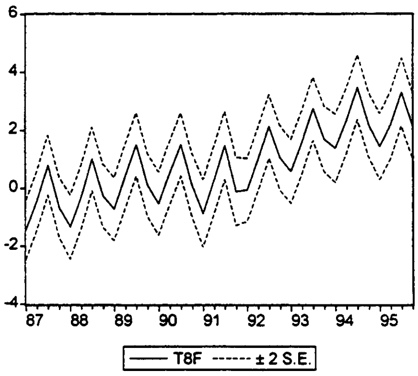
T8 = C(1) + C(2)*CL28 + C(3)*FF28 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM91 + C(8)*T8(-4)

Substituted Coefficients:

T8 = -15.387626 - 1.5467568*CL28 - 1.8699386*FF28 + 0.5194805*D2 - 1.7192299*D3 + 2.1420828*D4 - 0.65688908*DM91 + 0.39017897*T8(-4)

Actual: T8 Forecast: T8F
Sample: 1987:1 1995:4
Include observations: 36

Root Mean Squared Error		0.413749
Mean Absolute Error		0.335355
Mean Absolute Percentage Error		571.3542
Theil Inequality Coefficient		0.135105
Bias Proportion	0.001618	
Variance Proportion	0.014260	
Covariance Proportion	0.984122	

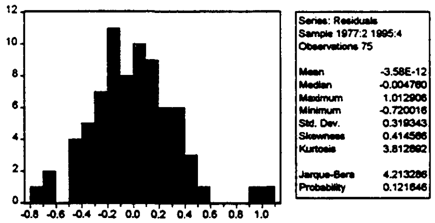


9. DENMARK TO TURKEY:
LS // Dependent Variable is T9
Date: 12/14/97 Time: 19:31
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.586806	1.279459	-3.584957	0.0006
IN2	0.688842	0.281584	2.446316	0.0171
D2	0.905667	0.169375	5.347113	0.0000
D3	-2.157177	0.379063	-5.690806	0.0000
D4	2.590132	0.468213	5.531948	0.0000
DM91	-0.379855	0.226393	-1.677856	0.0981
TREND	0.019673	0.004103	4.794777	0.0000
T9(-4)	0.414962	0.100242	4.139607	0.0001
AR(1)	0.333444	0.111905	2.979713	0.0040

R-squared	0.924489	Mean dependent var	-0.337362
Adjusted R-squared	0.915336	S.D. dependent var	1.162121
S.E. of regression	0.338144	Akaike info criterion	-2.056400
Sum squared resid	7.546529	Schwarz criterion	-1.778302
Log likelihood	-20.30537	F-statistic	101.0050
Durbin-Watson stat	1.904538	Prob(F-statistic)	0.000000

Inverted AR Roots .33



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.960021	Probability	0.111731
Obs*R-squared	8.419323	Probability	0.077371

White Heteroskedasticity Test:

F-statistic	3.062906	Probability	0.003101
Obs*R-squared	24.27562	Probability	0.006901

Ramsey RESET Test:

F-statistic	4.685613	Probability	0.034094
Log likelihood ratio	5.220496	Probability	0.022322

Estimation Command:

LS T9 C IN2 D2 D3 D4 DM91 TREND T9(-4) AR(1)

Estimation Equation:

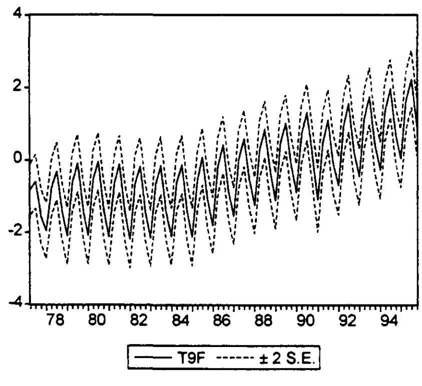
T9 = C(1) + C(2)*IN2 + C(3)*D2 + C(4)*D3 + C(5)*D4 + C(6)*DM91 + C(7)*TREND + C(8)*T9(-4) + [AR(1)=C(9)]

Substituted Coefficients:

T9 = -4.5868062 + 0.68884238*IN2 + 0.90566728*D2 - 2.1571766*D3 + 2.5901325*D4 - 0.3798553*DM91 + 0.019673301*TREND + 0.41496153*T9(-4) + [AR(1)=0.33344434]

Actual: T9 Forecast: T9F
Sample: 1977:2 1995:4
Include observations: 75

Root Mean Squared Error		0.338001
Mean Absolute Error		0.269624
Mean Absolute Percentage Error		72.56135
Theil Inequality Coefficient		0.143696
Bias Proportion	0.000000	
Variance Proportion	0.026828	
Covariance Proportion	0.973172	

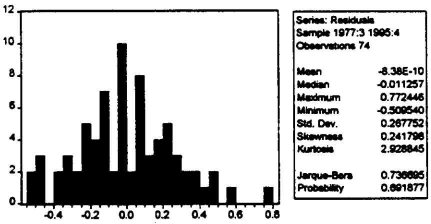


10. SWITZERLAND TO TURKEY:
LS // Dependent Variable is T10
Date: 12/14/97 Time: 21:20
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints
Convergence achieved after 7 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.185165	1.552049	-2.696543	0.0090
IN11	1.031333	0.391782	2.632412	0.0107
EX30	0.541288	0.206674	2.619042	0.0110
S24	-0.851369	0.514018	-1.656303	0.1026
D2	0.848365	0.172283	4.924260	0.0000
D3	-2.085445	0.319681	-6.523519	0.0000
D4	2.695237	0.443911	6.071566	0.0000
DM91	-0.746132	0.175763	-4.245097	0.0001
TREND	0.057884	0.025026	2.312923	0.0240
T10(-4)	0.349878	0.091839	3.809674	0.0003
AR(2)	0.358370	0.104875	3.417119	0.0011

R-squared	0.896079	Mean dependent var	0.275761
Adjusted R-squared	0.879584	S.D. dependent var	0.830581
S.E. of regression	0.288220	Akaike info criterion	-2.351694
Sum squared resid	5.233466	Schwarz criterion	-2.009198
Log likelihood	-6.988767	F-statistic	54.32313
Durbin-Watson stat	1.633643	Prob(F-statistic)	0.000000

Inverted AR Roots .60 -.60



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	5.072435	Probability	0.001397
Obs*R-squared	18.93613	Probability	0.000809

White Heteroskedasticity Test:

F-statistic	1.534772	Probability	0.127031
Obs*R-squared	19.75508	Probability	0.138054

Ramsey RESET Test:

F-statistic	0.144359	Probability	0.705284
Log likelihood ratio	0.172099	Probability	0.678253

Estimation Command:

LS T10 C IN11 EX30 S24 D2 D3 D4 DM91 TREND T10(-4) AR(2)

Estimation Equation:

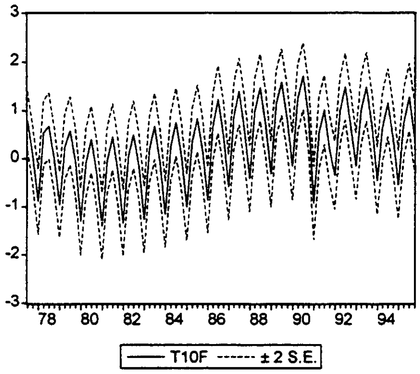
T10 = C(1) + C(2)*IN11 + C(3)*EX30 + C(4)*S24 + C(5)*D2 + C(6)*D3 + C(7)*D4 + C(8)*DM91 + C(9)*TREND + C(10)*T10(-4) + [AR(2)=C(11)]

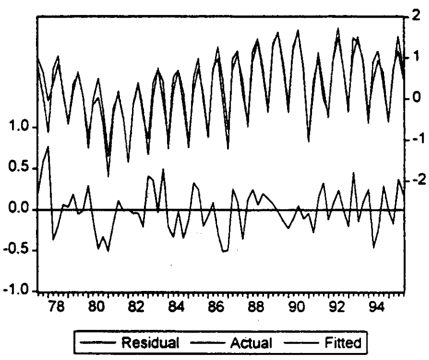
Substituted Coefficients:

T10 = -4.1851653 + 1.0313329*IN11 + 0.54128769*EX30 - 0.85136904*S24 + 0.84836462*D2 - 2.0854445*D3 + 2.6952375*D4 - 0.74613174*DM91 + 0.057883563*TREND + 0.34987818*T10(-4) + [AR(2)=0.35837048]

Actual: T10 Forecast: T10F
Sample: 1977:3 1995:4
Include observations: 74

Root Mean Squared Error		0.267589
Mean Absolute Error		0.213996
Mean Absolute Percentage Error		99.66265
Theil Inequality Coefficient		0.158113
Bias Proportion	0.000820	
Variance Proportion	0.038857	
Covariance Proportion	0.960323	





11. GREECE TO TURKEY:

LS // Dependent Variable is T11
Date: 12/17/97 Time: 13:10
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.082410	1.301581	-3.136502	0.0026
CL25	-0.551029	0.164684	-3.345984	0.0014
D2	0.279037	0.067321	4.144888	0.0001
D3	-0.788241	0.155360	-5.073643	0.0000
D4	1.109451	0.216868	5.115793	0.0000
DM87	-0.476508	0.170801	-2.789842	0.0069
DM91	-0.432325	0.170219	-2.539817	0.0135
TREND	0.053992	0.014786	3.651487	0.0005
T11(-4)	0.313957	0.107225	2.928023	0.0047
AR(1)	0.652516	0.095570	6.827629	0.0000

R-squared	0.886460	Mean dependent var	1.210065
Adjusted R-squared	0.870739	S.D. dependent var	0.618577
S.E. of regression	0.222396	Akaike info criterion	-2.883027
Sum squared resid	3.214895	Schwarz criterion	-2.574028
Log likelihood	11.69312	F-statistic	56.38742
Durbin-Watson stat	2.125929	Prob(F-statistic)	0.000000

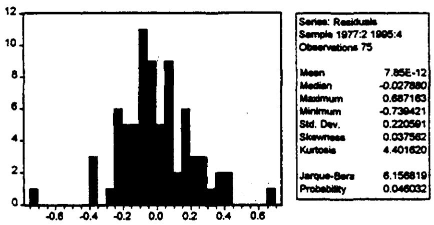
Inverted AR Roots .65

LS // Dependent Variable is T11
Date: 12/17/97 Time: 12:59
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.584233	0.727644	-2.177209	0.0330
CL31	-0.451341	0.175832	-2.566889	0.0125
D2	0.277223	0.071122	3.897839	0.0002
D3	-0.805857	0.166297	-4.845883	0.0000
D4	1.129981	0.231884	4.873035	0.0000
DM91	-0.447425	0.181097	-2.470633	0.0161
TREND	0.027086	0.008939	3.029954	0.0035
T11(-4)	0.295237	0.115898	2.547393	0.0132
AR(1)	0.659567	0.095743	6.888961	0.0000

R-squared	0.869126	Mean dependent var	1.210065
Adjusted R-squared	0.853262	S.D. dependent var	0.618577
S.E. of regression	0.236954	Akaike info criterion	-2.767610
Sum squared resid	3.705721	Schwarz criterion	-2.489512
Log likelihood	6.365002	F-statistic	54.78766
Durbin-Watson stat	1.983654	Prob(F-statistic)	0.000000

Inverted AR Roots .66



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.218332	Probability	0.077215
Obs*R-squared	9.389988	Probability	0.052058

White Heteroskedasticity Test:

F-statistic	1.016347	Probability	0.439922
Obs*R-squared	10.27811	Probability	0.416442

Ramsey RESET Test:

F-statistic	6.633475	Probability	0.012291
Log likelihood ratio	7.288142	Probability	0.006941

Estimation Command:

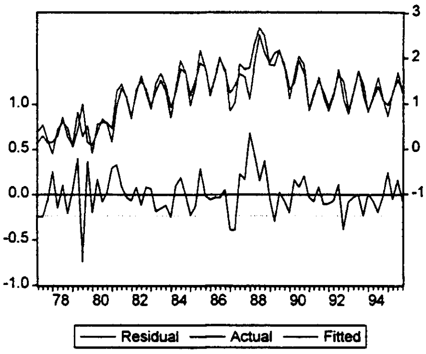
LS T11 C CL25 D2 D3 D4 DM91 TREND T11(-4) SAR(1)

Estimation Equation:

T11 = C(1) + C(2)*CL25 + C(3)*D2 + C(4)*D3 + C(5)*D4 + C(6)*DM91 + C(7)*TREND + C(8)*T11(-4) + [AR(1)=C(9)]

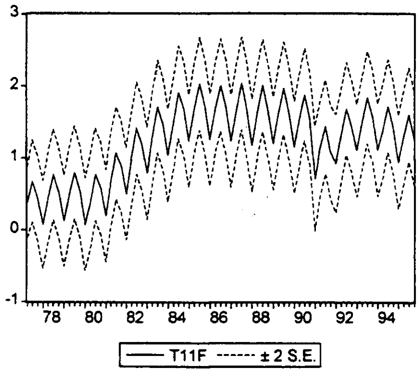
Substituted Coefficients:

T11 = -3.8427226 - 0.51835277*CL25 + 0.28761834*D2 - 0.81339619*D3 + 1.1442889*D4 - 0.4161824*DM91 + 0.05147709*TREND + 0.29181726*T11(-4) + [AR(1)=0.62419424]



Actual: T11 Forecast: T11F
Sample: 1977:2 1995:4
Include observations: 75

Root Mean Squared Error		0.292996
Mean Absolute Error		0.225708
Mean Absolute Percentage Error		31.49351
Theil Inequality Coefficient		0.109529
Bias Proportion	0.000022	
Variance Proportion	0.106155	
Covariance Proportion	0.893823	



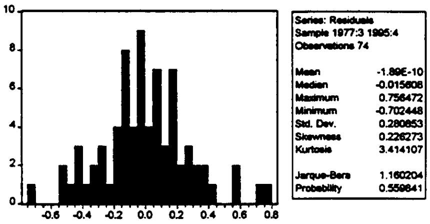
12. BELGIUM TO TURKEY:
LS // Dependent Variable is T12
Date: 12/17/97 Time: 14:53
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.903157	1.193013	-4.948110	0.0000
IN1	0.919127	0.253943	3.619418	0.0006
S26	-0.454678	0.279421	-1.627216	0.1087
D2	1.105970	0.198315	5.576835	0.0000
D3	-2.810637	0.437198	-6.428748	0.0000

D4	3.307439	0.536022	6.170344	0.0000
DM80	-0.337486	0.190308	-1.773369	0.0810
DM91	-0.579882	0.179247	-3.235103	0.0019
TREND	0.017762	0.003548	5.005603	0.0000
T12(-4)	0.207708	0.115865	1.792666	0.0778
AR(2)	0.288835	0.121680	2.373720	0.0207

R-squared	0.929995	Mean dependent var	-0.551893
Adjusted R-squared	0.918884	S.D. dependent var	1.061491
S.E. of regression	0.302323	Akaike info criterion	-2.256154
Sum squared resid	5.758138	Schwarz criterion	-1.913657
Log likelihood	-10.52377	F-statistic	83.69414
Durbin-Watson stat	1.694659	Prob(F-statistic)	0.000000

Inverted AR Roots .54 -.54



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.816068	Probability	0.033080
Obs*R-squared	11.86316	Probability	0.018398

White Heteroskedasticity Test:

F-statistic	1.851827	Probability	0.055225
Obs*R-squared	21.18922	Probability	0.069269

Ramsey RESET Test:

F-statistic	0.000724	Probability	0.978620
Log likelihood ratio	0.000864	Probability	0.976549

Estimation Command:

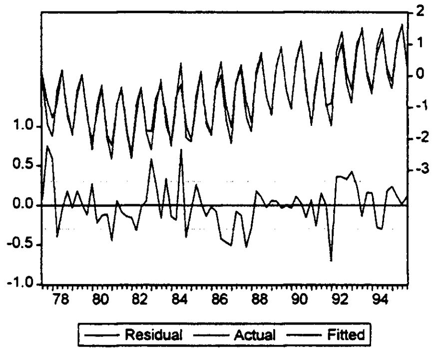
LS T12 C IN1 S26 D2 D3 D4 DM80 DM91 TREND T12(-4) SAR(2)

Estimation Equation:

T12 = C(1) + C(2)*IN1 + C(3)*S26 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM80 + C(8)*DM91 + C(9)*TREND + C(10)*T12(-4) + [AR(2)=C(11)]

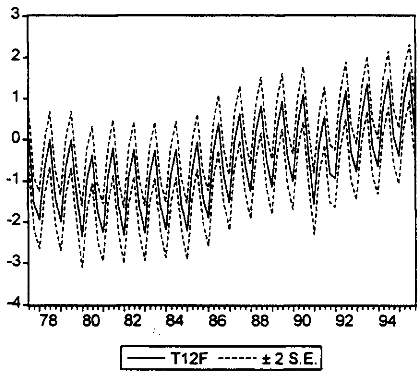
Substituted Coefficients:

T12 = -5.9031575 + 0.91912731*IN1 - 0.4546782*S26 + 1.1059699*D2 - 2.8106369*D3 + 3.3074387*D4 - 0.33748616*DM80 - 0.5798822*DM91 + 0.01776165*TREND + 0.2077081*T12(-4) + [AR(2)=0.28883492]



Actual: T12 Forecast: T12F
Sample: 1977:3 1995:4
Include observations: 74

Root Mean Squared Error		0.290951
Mean Absolute Error		0.223668
Mean Absolute Percentage Error		53.05020
Theil Inequality Coefficient		0.124424
Bias Proportion	0.000140	
Variance Proportion	0.024283	
Covariance Proportion	0.975577	



13. NETHERLANDS TO TURKEY:
LS // Dependent Variable is T13
Date: 12/17/97 Time: 15:34
Sample(adjusted): 1977:4 1995:4
Included observations: 73 after adjusting endpoints
Convergence achieved after 7 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.741502	0.919484	-4.069133	0.0001
IN9	0.615732	0.194350	3.168163	0.0024
EX33	0.233198	0.184480	1.264078	0.2109
S27	-0.476059	0.239248	-1.989812	0.0510
D2	0.719333	0.143880	4.999547	0.0000
D3	-1.721353	0.321192	-5.359262	0.0000
D4	2.138932	0.399684	5.351555	0.0000
DM91	-0.521531	0.136909	-3.809325	0.0003
TREND	0.040982	0.019152	2.139889	0.0363
T13(-4)	0.535476	0.081834	6.543431	0.0000
AR(3)	0.346730	0.102183	3.393247	0.0012

R-squared	0.956933	Mean dependent var	-0.290435
Adjusted R-squared	0.949987	S.D. dependent var	1.117578
S.E. of regression	0.249931	Akaike info criterion	-2.635093
Sum squared resid	3.872875	Schwarz criterion	-2.289955

Log likelihood	3.598367	F-statistic	137.7614
Durbin-Watson stat	1.863784	Prob(F-statistic)	0.000000

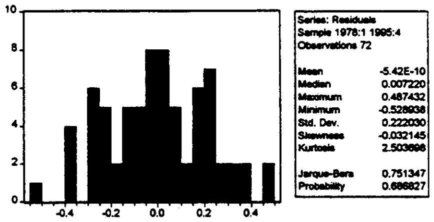
Inverted AR Roots .70 -.35+.61i -.35 -.61i

LS // Dependent Variable is T13
Date: 12/17/97 Time: 15:42
Sample(adjusted): 1978:1 1995:4
Included observations: 72 after adjusting endpoints
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.438712	0.870105	-2.802780	0.0068
IN9	0.312455	0.109387	2.856422	0.0058
EX33	0.357145	0.140520	2.541596	0.0135
D2	0.754853	0.282802	2.669187	0.0097
D3	-1.781669	0.648894	-2.745700	0.0079
D4	2.161802	0.803541	2.690344	0.0092
DM91	-0.501522	0.139679	-3.590520	0.0007
TREND	0.053238	0.013914	3.826122	0.0003
T13(-4)	0.515537	0.175076	2.944648	0.0045
AR(4)	0.156032	0.192856	0.809059	0.4216

R-squared	0.960955	Mean dependent var	-0.283094
Adjusted R-squared	0.955287	S.D. dependent var	1.123646
S.E. of regression	0.237599	Akaike info criterion	-2.746092
Sum squared resid	3.500116	Schwarz criterion	-2.429888
Log likelihood	6.695743	F-statistic	169.5460
Durbin-Watson stat	2.192345	Prob(F-statistic)	0.000000

Inverted AR Roots .63



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.328237	Probability	0.270316
Obs*R-squared	6.041927	Probability	0.196039

White Heteroskedasticity Test:

F-statistic	1.408840	Probability	0.187782
Obs*R-squared	16.03610	Probability	0.189588

Ramsey RESET Test:

F-statistic	9.184430	Probability	0.003578
Log likelihood ratio	10.09819	Probability	0.001484

Estimation Command:

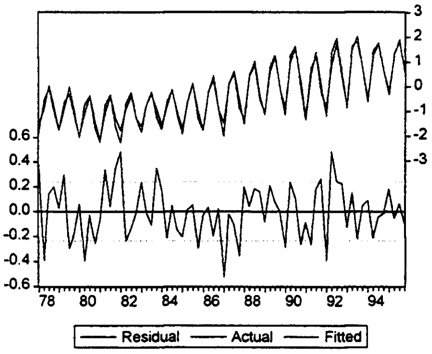
LS T13 C IN9 EX33 D2 D3 D4 DM91 TREND T13(-4) SAR(4)

Estimation Equation:

T13 = C(1) + C(2)*IN9 + C(3)*EX33 + C(4)*D2 + C(5)*D3 + C(6)*D4 + C(7)*DM91 + C(8)*TREND + C(9)*T13(-4) + [AR(4)=C(10)]

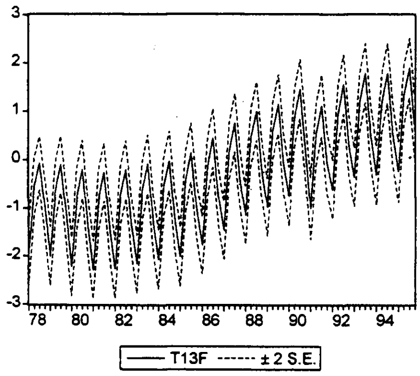
Substituted Coefficients:

T13 = -2.4387125 + 0.31245464*IN9 + 0.35714494*EX33 + 0.75485267*D2 - 1.7816689*D3 + 2.1618017*D4 - 0.50152166*DM91 + 0.053237678*TREND + 0.51553685*T13(-4) + [AR(4)=0.15603215]



Actual: T13 Forecast: T13F
Sample: 1978:1 1995:4
Include observations: 72

Root Mean Squared Error		0.260190
Mean Absolute Error		0.207536
Mean Absolute Percentage Error		80.82644
Theil Inequality Coefficient		0.114739
Bias Proportion	0.000011	
Variance Proportion	0.018695	
Covariance Proportion	0.981294	



2. UROOT TESTS IN *TSP* WITH 4 LAGGED INCLUDING CONSTANT AND TREND VARIABLE: 8 OCT, 1997

2.1 DEPENDENT VARIABLES:

```
LS // Dependent Variable is D(D(A1))
    Date: 10-08-1997 / Time: 14:37
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(A1)
          VARIABLE      COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
        D(D(A1(-1)))     1.8460125     0.6142221     3.0054478     0.0037
        D(D(A1(-2)))     0.8857558     0.4413890     2.0067462     0.0488
        D(D(A1(-3)))    -0.0649822     0.2717333    -0.2391397     0.8117
        D(D(A1(-4)))    -0.0441733     0.1199937    -0.3681299     0.7139
         D(A1(-1))      -3.8808471     0.6955868    -5.5792422     0.0000
             C           0.0564476     0.0290013     1.9463818     0.0558
           TREND        -0.0011694     0.0005947    -1.9665443     0.0534

    R-squared                 0.998445    Mean of dependent var    -0.021043
    Adjusted R-squared        0.998305    S.D. of dependent var     2.494185
    S.E. of regression        0.102675    Sum of squared resid      0.706327
    Log likelihood            67.11303    F-statistic               7168.398
    Durbin-Watson stat        2.013227    Prob(F-statistic)         0.000000


LS // Dependent Variable is D(D(A2))
    Date: 10-08-1997 / Time: 14:40
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(A2)
          VARIABLE      COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
        D(D(A2(-1)))     0.7253971     0.5449770     1.3310599     0.1877
        D(D(A2(-2)))     0.0679812     0.3937740     0.1726402     0.8635
        D(D(A2(-3)))    -0.5697069     0.2459823    -2.3160484     0.0236
        D(D(A2(-4)))    -0.2328874     0.1161872    -2.0044161     0.0491
         D(A2(-1))      -2.6191117     0.6157002    -4.2538751     0.0001
             C           0.0865958     0.0485259     1.7845256     0.0789
           TREND        -0.0015782     0.0009794    -1.6114106     0.1118

    R-squared                 0.994151    Mean of dependent var    -0.033931
    Adjusted R-squared        0.993627    S.D. of dependent var     2.123419
    S.E. of regression        0.169513    Sum of squared resid      1.925219
    Log likelihood            30.01248    F-statistic               1897.973
    Durbin-Watson stat        2.073602    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(A3))
    Date: 10-08-1997 / Time: 14:41
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(A3)
          VARIABLE      COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
        D(D(A3(-1)))     0.2935157     0.3989576     0.7357065     0.4645
        D(D(A3(-2)))    -0.1707796     0.2910917    -0.5866866     0.5594
        D(D(A3(-3)))    -0.6261179     0.1896733    -3.3010335     0.0015
        D(D(A3(-4)))    -0.1189990     0.1114831    -1.0674179     0.2896
         D(A3(-1))      -1.9090669     0.4485646    -4.2559468     0.0001
             C           0.0971454     0.0339077     2.8649966     0.0056
           TREND        -0.0019256     0.0006864    -2.8053504     0.0066

    R-squared                 0.995938    Mean of dependent var    -0.018811
    Adjusted R-squared        0.995574    S.D. of dependent var     1.669528
    S.E. of regression        0.111069    Sum of squared resid      0.826540
    Log likelihood            61.29772    F-statistic               2737.804
    Durbin-Watson stat        2.030736    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(A4))
    Date: 10-08-1997 / Time: 14:42
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(A4)
          VARIABLE      COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
        D(D(A4(-1)))     0.5505329     0.3862476     1.4253368     0.1587
        D(D(A4(-2)))     0.0890315     0.2857326     0.3115904     0.7563
        D(D(A4(-3)))    -0.3559055     0.1909209    -1.8641512     0.0667
```

D(D(A4(-4)))	0.1530152	0.1178970	1.2978719	0.1988
D(A4(-1))	-1.8425622	0.4260162	-4.3250985	0.0001
C	0.0136871	0.0401357	0.3410214	0.7342
TREND	-0.0005587	0.0008358	-0.6684838	0.5061

R-squared	0.982297	Mean of dependent var	-0.025181
Adjusted R-squared	0.980712	S.D. of dependent var	1.088048
S.E. of regression	0.151110	Sum of squared resid	1.529902
Log likelihood	38.51642	F-statistic	619.6148
Durbin-Watson stat	2.050693	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(A5))
Date: 10-08-1997 / Time: 14:42
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(A5)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(A5(-1)))	2.8591203	0.6330200	4.5166352	0.0000
D(D(A5(-2)))	1.6187411	0.4518189	3.5827215	0.0006
D(D(A5(-3)))	0.3936971	0.2742759	1.4354052	0.1558
D(D(A5(-4)))	0.1127899	0.1151035	0.9798999	0.3307
D(A5(-1))	-5.0468282	0.7196006	-7.0133741	0.0000
C	0.1055625	0.0282950	3.7307776	0.0004
TREND	-0.0022559	0.0005853	-3.8541524	0.0003

R-squared	0.998990	Mean of dependent var	-0.014197
Adjusted R-squared	0.998900	S.D. of dependent var	2.654792
S.E. of regression	0.088053	Sum of squared resid	0.519470
Log likelihood	78.48195	F-statistic	11048.62
Durbin-Watson stat	1.917481	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(A6))
Date: 10-08-1997 / Time: 14:43
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(A6)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(A6(-1)))	1.0385856	0.3353398	3.0971140	0.0029
D(D(A6(-2)))	0.4479359	0.2547884	1.7580706	0.0833
D(D(A6(-3)))	0.0164112	0.1684071	0.0974497	0.9227
D(D(A6(-4)))	0.3870796	0.1103126	3.5089319	0.0008
D(A6(-1))	-2.0878364	0.3710415	-5.6269618	0.0000
C	0.0105159	0.0547233	0.1921649	0.8482
TREND	-0.0003429	0.0011303	-0.3034027	0.7625

R-squared	0.968484	Mean of dependent var	-0.027249
Adjusted R-squared	0.965662	S.D. of dependent var	1.116366
S.E. of regression	0.206869	Sum of squared resid	2.867245
Log likelihood	15.27495	F-statistic	343.1524
Durbin-Watson stat	2.096103	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(A7))
Date: 10-08-1997 / Time: 14:43
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(A7)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(A7(-1)))	0.6501425	0.3498672	1.8582552	0.0675
D(D(A7(-2)))	0.2626307	0.2628584	0.9991336	0.3213
D(D(A7(-3)))	-0.1694781	0.1794809	-0.9442681	0.3484
D(D(A7(-4)))	0.2247450	0.1127392	1.9934951	0.0503
D(A7(-1))	-1.8612019	0.3862220	-4.8189955	0.0000
C	-0.0289907	0.0514402	-0.5635815	0.5749
TREND	-7.792E-05	0.0010618	-0.0733870	0.9417

R-squared	0.885857	Mean of dependent var	-0.008066
Adjusted R-squared	0.875635	S.D. of dependent var	0.551424
S.E. of regression	0.194462	Sum of squared resid	2.533625
Log likelihood	19.85187	F-statistic	86.66402
Durbin-Watson stat	1.980694	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(M1))
Date: 10-08-1997 / Time: 14:44
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(M1)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(M1(-1)))	1.2013922	0.5185717	2.3167329	0.0236
D(D(M1(-2)))	0.3535796	0.3801666	0.9300649	0.3557
D(D(M1(-3)))	-0.1832612	0.2336586	-0.7843118	0.4356
D(D(M1(-4)))	-0.0916743	0.1072453	-0.8548093	0.3957

D(M1(-1))	-2.9406511	0.5902024	-4.9824456	0.0000
C	0.0650571	0.0993447	0.6548625	0.5148
TREND	0.0004998	0.0020191	0.2475125	0.8053

R-squared	0.910129	Mean of dependent var	-0.031878
Adjusted R-squared	0.902081	S.D. of dependent var	1.183509
S.E. of regression	0.370344	Sum of squared resid	9.189368
Log likelihood	-27.81879	F-statistic	113.0855
Durbin-Watson stat	2.063992	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(M2))
Date: 10-08-1997 / Time: 14:45
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(M2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(M2(-1)))	0.1520116	0.3688153	0.4121617	0.6815
D(D(M2(-2)))	-0.2964191	0.2815664	-1.0527504	0.2962
D(D(M2(-3)))	-0.5039558	0.1918150	-2.6273005	0.0107
D(D(M2(-4)))	-0.0717010	0.1177889	-0.6087248	0.5448
D(M2(-1))	-1.4512148	0.4102719	-3.5372028	0.0007
C	0.1264476	0.0767269	1.6480209	0.1040
TREND	-0.0022098	0.0015146	-1.4590283	0.1492

R-squared	0.830819	Mean of dependent var	-0.006722
Adjusted R-squared	0.815668	S.D. of dependent var	0.598208
S.E. of regression	0.256834	Sum of squared resid	4.419552
Log likelihood	-0.734460	F-statistic	54.83759
Durbin-Watson stat	1.973048	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(M3))
Date: 10-08-1997 / Time: 14:45
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(M3)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(M3(-1)))	0.5603285	0.4628191	1.2106857	0.2303
D(D(M3(-2)))	-0.0513798	0.3459447	-0.1485202	0.8824
D(D(M3(-3)))	-0.4115436	0.2199958	-1.8706882	0.0658
D(D(M3(-4)))	-0.1399310	0.1202536	-1.1636324	0.2487
D(M3(-1))	-2.1361439	0.5210239	-4.0998965	0.0001
C	0.0654872	0.0520404	1.2583923	0.2126
TREND	-0.0001502	0.0010264	-0.1462974	0.8841

R-squared	0.878858	Mean of dependent var	-0.010357
Adjusted R-squared	0.868010	S.D. of dependent var	0.518576
S.E. of regression	0.188401	Sum of squared resid	2.378162
Log likelihood	22.19482	F-statistic	81.01170
Durbin-Watson stat	1.989606	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(M4))
Date: 10-08-1997 / Time: 14:45
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(M4)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(M4(-1)))	1.4565746	0.5710711	2.5506011	0.0130
D(D(M4(-2)))	0.6029931	0.4148193	1.4536284	0.1507
D(D(M4(-3)))	-0.2026698	0.2564526	-0.7902815	0.4322
D(D(M4(-4)))	-0.0739491	0.1189760	-0.6215461	0.5363
D(M4(-1))	-3.3493276	0.6468297	-5.1780674	0.0000
C	0.0100370	0.0514438	0.1951066	0.8459
TREND	0.0011817	0.0010808	1.0933410	0.2782

R-squared	0.982198	Mean of dependent var	-0.031235
Adjusted R-squared	0.980604	S.D. of dependent var	1.396255
S.E. of regression	0.194457	Sum of squared resid	2.533510
Log likelihood	19.85355	F-statistic	616.1019
Durbin-Watson stat	2.054105	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(M5))
Date: 10-08-1997 / Time: 14:46
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(M5)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(M5(-1)))	0.7462946	0.3765364	1.9819985	0.0516
D(D(M5(-2)))	0.2752864	0.2886164	0.9538141	0.3436
D(D(M5(-3)))	-0.0944396	0.1959844	-0.4818729	0.6315
D(D(M5(-4)))	0.2174921	0.1182061	1.8399400	0.0702
D(M5(-1))	-2.0690568	0.4195819	-4.9312349	0.0000

C	0.0855366	0.0980041	0.8727866	0.3859
TREND	-0.0016010	0.0020186	-0.7931385	0.4305

R-squared	0.832378	Mean of dependent var	-0.011900
Adjusted R-squared	0.817368	S.D. of dependent var	0.865490
S.E. of regression	0.369872	Sum of squared resid	9.165940
Log likelihood	-27.72434	F-statistic	55.45163
Durbin-Watson stat	2.063637	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(M6))
Date: 10-08-1997 / Time: 14:46
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(M6)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(M6(-1)))	0.2754228	0.4255263	0.6472521	0.5197
D(D(M6(-2)))	-0.3326559	0.3211547	-1.0358120	0.3040
D(D(M6(-3)))	-0.5604895	0.2024592	-2.7684080	0.0073
D(D(M6(-4)))	-0.2290803	0.1177688	-1.9451703	0.0560
D(M6(-1))	-1.7558696	0.4805318	-3.6540137	0.0005
C	0.0755284	0.0670857	1.1258484	0.2642
TREND	-0.0012959	0.0013679	-0.9473406	0.3469

R-squared	0.924774	Mean of dependent var	-0.016283
Adjusted R-squared	0.918037	S.D. of dependent var	0.868780
S.E. of regression	0.248725	Sum of squared resid	4.144884
Log likelihood	1.639586	F-statistic	137.2742
Durbin-Watson stat	1.931492	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(M7))
Date: 10-08-1997 / Time: 14:47
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(M7)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(M7(-1)))	0.2845965	0.3536179	0.8048134	0.4238
D(D(M7(-2)))	-0.1932750	0.2679649	-0.7212696	0.4733
D(D(M7(-3)))	-0.4730381	0.1782002	-2.6545312	0.0099
D(D(M7(-4)))	0.0040658	0.1172060	0.0346892	0.9724
D(M7(-1))	-1.5637066	0.3973170	-3.9356646	0.0002
C	-0.0596695	0.0469971	-1.2696416	0.2086
TREND	0.0011711	0.0009730	1.2035205	0.2330

R-squared	0.926036	Mean of dependent var	-0.008994
Adjusted R-squared	0.919413	S.D. of dependent var	0.608396
S.E. of regression	0.172711	Sum of squared resid	1.998549
Log likelihood	28.62936	F-statistic	139.8083
Durbin-Watson stat	1.957352	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(N1,2))
Date: 10-08-1997 / Time: 14:48
SMPL range: 1984.4 - 1995.4
Number of observations: 45
Augmented Dickey-Fuller: UROOT(T,4) D(N1,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(N1(-1),2))	2.5609289	0.8740414	2.9299858	0.0057
D(D(N1(-2),2))	1.2603298	0.6418226	1.9636730	0.0569
D(D(N1(-3),2))	0.3081070	0.3731795	0.8256269	0.4142
D(D(N1(-4),2))	-0.0279045	0.1525525	-0.1829175	0.8558
D(N1(-1),2)	-4.8031123	0.9997387	-4.8043675	0.0000
C	-0.0274952	0.2100309	-0.1309103	0.8965
TREND	0.0006259	0.0035331	0.1771548	0.8603

R-squared	0.901150	Mean of dependent var	-0.016556
Adjusted R-squared	0.885542	S.D. of dependent var	0.906726
S.E. of regression	0.306760	Sum of squared resid	3.575868
Log likelihood	-6.872006	F-statistic	57.73677
Durbin-Watson stat	1.982801	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(N2,2))
Date: 10-08-1997 / Time: 14:49
SMPL range: 1984.4 - 1995.4
Number of observations: 45
Augmented Dickey-Fuller: UROOT(T,4) D(N2,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(N2(-1),2))	2.7199114	0.8546556	3.1824648	0.0029
D(D(N2(-2),2))	1.4890358	0.6205203	2.3996570	0.0214
D(D(N2(-3),2))	0.3257038	0.3777963	0.8621148	0.3940
D(D(N2(-4),2))	0.0654985	0.1646440	0.3978190	0.6930
D(N2(-1),2)	-4.8569733	0.9711394	-5.0013141	0.0000
C	0.0478891	0.2167263	0.2209659	0.8263

TREND	-0.0008478	0.0036469	-0.2324723	0.8174

R-squared	0.965116	Mean of dependent var	-0.014923
Adjusted R-squared	0.959608	S.D. of dependent var	1.572999
S.E. of regression	0.316136	Sum of squared resid	3.797790
Log likelihood	-8.226760	F-statistic	175.2228
Durbin-Watson stat	2.011963	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(N3,2))
Date: 10-08-1997 / Time: 14:49
SMPL range: 1984.4 - 1995.4
Number of observations: 45
Augmented Dickey-Fuller: UROOT(T,4) D(N3,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(N3(-1),2))	2.0614744	0.8425468	2.4467180	0.0192
D(D(N3(-2),2))	1.0086772	0.6031310	1.6724015	0.1027
D(D(N3(-3),2))	0.0138449	0.3632343	0.0381156	0.9698
D(D(N3(-4),2))	-0.0983865	0.1439992	-0.6832430	0.4986
D(N3(-1),2)	-4.2425790	0.9670696	-4.3870463	0.0001
C	0.0104207	0.2242414	0.0464711	0.9632
TREND	-0.0002363	0.0037714	-0.0626576	0.9504

R-squared	0.977022	Mean of dependent var	0.029839
Adjusted R-squared	0.973394	S.D. of dependent var	2.002196
S.E. of regression	0.326585	Sum of squared resid	4.053001
Log likelihood	-9.690122	F-statistic	269.2934
Durbin-Watson stat	1.969095	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(N4,2))
Date: 10-08-1997 / Time: 14:50
SMPL range: 1984.4 - 1995.4
Number of observations: 45
Augmented Dickey-Fuller: UROOT(T,4) D(N4,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(N4(-1),2))	2.8349713	0.8679736	3.2661954	0.0023
D(D(N4(-2),2))	1.6071376	0.6156725	2.6103773	0.0129
D(D(N4(-3),2))	0.4821637	0.3645541	1.3226121	0.1939
D(D(N4(-4),2))	0.0201565	0.1431652	0.1407917	0.8888
D(N4(-1),2)	-5.1974468	1.0014200	-5.1900766	0.0000
C	0.1211077	0.3362315	0.3601915	0.7207
TREND	-0.0020911	0.0056590	-0.3695235	0.7138

R-squared	0.939844	Mean of dependent var	0.027540
Adjusted R-squared	0.930346	S.D. of dependent var	1.836250
S.E. of regression	0.484623	Sum of squared resid	8.924673
Log likelihood	-27.45077	F-statistic	98.94921
Durbin-Watson stat	1.857216	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(N5,2))
Date: 10-08-1997 / Time: 14:51
SMPL range: 1984.4 - 1995.4
Number of observations: 45
Augmented Dickey-Fuller: UROOT(T,4) D(N5,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(N5(-1),2))	2.3386986	0.8624591	2.7116633	0.0100
D(D(N5(-2),2))	1.1595222	0.6583968	1.7611298	0.0863
D(D(N5(-3),2))	0.3323823	0.4078556	0.8149510	0.4202
D(D(N5(-4),2))	-0.0234411	0.1792616	-0.1307648	0.8967
D(N5(-1),2)	-4.5205566	0.9767137	-4.6283332	0.0000
C	-0.2184794	0.6703427	-0.3259219	0.7463
TREND	0.0034227	0.0112896	0.3031694	0.7634

R-squared	0.872789	Mean of dependent var	-0.005238
Adjusted R-squared	0.852704	S.D. of dependent var	2.549405
S.E. of regression	0.978442	Sum of squared resid	36.37922
Log likelihood	-59.06727	F-statistic	43.45290
Durbin-Watson stat	1.977495	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(N5))
Date: 10-08-1997 / Time: 14:52
SMPL range: 1984.3 - 1995.4
Number of observations: 46
Augmented Dickey-Fuller: UROOT(T,4) D(N5)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(N5(-1)))	0.7454217	0.5525577	1.3490386	0.1851
D(D(N5(-2)))	0.2648221	0.4420147	0.5991252	0.5526
D(D(N5(-3)))	0.0246142	0.3075488	0.0800336	0.9366
D(D(N5(-4)))	-0.0082615	0.1784529	-0.0462950	0.9633
D(N5(-1))	-2.2341112	0.6274656	-3.5605320	0.0010
C	0.0937079	0.5569244	0.1682596	0.8672
TREND	-0.0009247	0.0094312	-0.0980446	0.9224

R-squared	0.705729	Mean of dependent var	-0.055467
Adjusted R-squared	0.660456	S.D. of dependent var	1.452320
S.E. of regression	0.846272	Sum of squared resid	27.93088
Log likelihood	-53.79628	F-statistic	15.58847
Durbin-Watson stat	1.999857	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(N6))
Date: 10-08-1997 / Time: 14:52
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(N6)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(N6(-1)))	0.1959017	0.4089506	0.4790351	0.6335
D(D(N6(-2)))	-0.2635910	0.3089397	-0.8532117	0.3966
D(D(N6(-3)))	-0.5514089	0.2031961	-2.7136780	0.0085
D(D(N6(-4)))	-0.1317847	0.1188860	-1.1084966	0.2716
D(N6(-1))	-1.6589719	0.4576205	-3.6252134	0.0006
C	-0.0121533	0.0532481	-0.2282393	0.8202
TREND	0.0007855	0.0011156	0.7041217	0.4838

R-squared	0.860894	Mean of dependent var	-0.003262
Adjusted R-squared	0.848437	S.D. of dependent var	0.516050
S.E. of regression	0.200904	Sum of squared resid	2.704280
Log likelihood	17.44003	F-statistic	69.10809
Durbin-Watson stat	1.801202	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(T1))
Date: 10-08-1997 / Time: 14:55
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(T1)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(T1(-1)))	0.2925397	0.4567818	0.6404364	0.5241
D(D(T1(-2)))	-0.2131511	0.3374785	-0.6315990	0.5298
D(D(T1(-3)))	-0.6408366	0.2163080	-2.9626125	0.0042
D(D(T1(-4)))	-0.1649035	0.1215179	-1.3570313	0.1793
D(T1(-1))	-1.8936262	0.5101628	-3.7118073	0.0004
C	-0.0332142	0.0711701	-0.4666882	0.6422
TREND	0.0017998	0.0014863	1.2109070	0.2302

R-squared	0.970501	Mean of dependent var	-0.027000
Adjusted R-squared	0.967859	S.D. of dependent var	1.502172
S.E. of regression	0.269307	Sum of squared resid	4.859269
Log likelihood	-4.243895	F-statistic	367.3760
Durbin-Watson stat	2.013136	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(T2)
Date: 10-08-1997 / Time: 14:56
SMPL range: 1977.2 - 1995.4
Number of observations: 75
Augmented Dickey-Fuller: UROOT(T,4) T2

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(T2(-1))	0.1218671	0.1585127	0.7688158	0.4447
D(T2(-2))	-0.1599567	0.1367117	-1.1700298	0.2461
D(T2(-3))	-0.1415613	0.1099615	-1.2873713	0.2023
D(T2(-4))	0.5376467	0.0979314	5.4900328	0.0000
T2(-1)	-0.5623537	0.1542381	-3.6460118	0.0005
C	-0.0535842	0.0910607	-0.5884440	0.5582
TREND	0.0117788	0.0036253	3.2490215	0.0018

R-squared	0.902928	Mean of dependent var	0.018193
Adjusted R-squared	0.894363	S.D. of dependent var	1.049538
S.E. of regression	0.341119	Sum of squared resid	7.912624
Log likelihood	-22.08181	F-statistic	105.4189
Durbin-Watson stat	2.315074	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(T3))
Date: 10-08-1997 / Time: 14:56
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(T3)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(T3(-1)))	0.4277044	0.3841417	1.1134025	0.2695
D(D(T3(-2)))	-0.0555043	0.2878002	-0.1928570	0.8477
D(D(T3(-3)))	-0.4221840	0.1899951	-2.2220785	0.0297
D(D(T3(-4)))	0.0570948	0.1191431	0.4792118	0.6333
D(T3(-1))	-1.7577971	0.4264855	-4.1215873	0.0001
C	-0.0508842	0.0918168	-0.5541925	0.5813
TREND	0.0014194	0.0019021	0.7462532	0.4581

R-squared	0.955405	Mean of dependent var	-0.025137
Adjusted R-squared	0.951411	S.D. of dependent var	1.574676
S.E. of regression	0.347103	Sum of squared resid	8.072212
Log likelihood	-23.02286	F-statistic	239.2346
Durbin-Watson stat	2.005948	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(T4))
Date: 10-08-1997 / Time: 14:57
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(T4)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(T4(-1)))	0.1953236	0.3942763	0.4953976	0.6219
D(D(T4(-2)))	-0.2284457	0.2968796	-0.7694894	0.4443
D(D(T4(-3)))	-0.6111990	0.1990746	-3.0702004	0.0031
D(D(T4(-4)))	-0.0103537	0.1293879	-0.0800203	0.9365
D(T4(-1))	-1.5716774	0.4331579	-3.6284168	0.0006
C	-0.0350767	0.0710644	-0.4935900	0.6232
TREND	0.0015567	0.0015045	1.0346695	0.3045

R-squared	0.975852	Mean of dependent var	-0.027449
Adjusted R-squared	0.973690	S.D. of dependent var	1.651476
S.E. of regression	0.267875	Sum of squared resid	4.807726
Log likelihood	-3.849340	F-statistic	451.2688
Durbin-Watson stat	1.993923	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(T5))
Date: 10-08-1997 / Time: 14:58
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(T5)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(T5(-1)))	0.4633969	0.3915899	1.1833729	0.2408
D(D(T5(-2)))	-0.0244962	0.2930642	-0.0835864	0.9336
D(D(T5(-3)))	-0.3992894	0.1944887	-2.0530207	0.0440
D(D(T5(-4)))	0.0794286	0.1210647	0.6560838	0.5140
D(T5(-1))	-1.7694512	0.4325982	-4.0902876	0.0001
C	-0.0110969	0.0852309	-0.1301975	0.8968
TREND	0.0005000	0.0017591	0.2842613	0.7771

R-squared	0.961691	Mean of dependent var	-0.027757
Adjusted R-squared	0.958260	S.D. of dependent var	1.580804
S.E. of regression	0.322964	Sum of squared resid	6.988466
Log likelihood	-17.68870	F-statistic	280.3214
Durbin-Watson stat	2.041990	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(T6)
Date: 10-08-1997 / Time: 14:58
SMPL range: 1977.2 - 1995.4
Number of observations: 75
Augmented Dickey-Fuller: UROOT(T,4) T6

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(T6(-1))	0.1718837	0.1240427	1.3856817	0.1704
D(T6(-2))	0.0358475	0.1053686	0.3402105	0.7347
D(T6(-3))	-0.0719797	0.0887559	-0.8109842	0.4202
D(T6(-4))	0.7676733	0.0796594	9.6369504	0.0000
T6(-1)	-0.4848905	0.1105129	-4.3876367	0.0000
C	-1.0490885	0.2438265	-4.3026028	0.0001
TREND	0.0024338	0.0015279	1.5928903	0.1158

R-squared	0.913229	Mean of dependent var	0.017284
Adjusted R-squared	0.905573	S.D. of dependent var	0.898274
S.E. of regression	0.276030	Sum of squared resid	5.181099
Log likelihood	-6.202727	F-statistic	119.2792
Durbin-Watson stat	1.969258	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(T7,2))
Date: 10-08-1997 / Time: 14:59
SMPL range: 1987.4 - 1995.4
Number of observations: 33
Augmented Dickey-Fuller: UROOT(T,4) D(T7,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(T7(-1),2))	3.0733440	1.0907129	2.8177388	0.0091
D(D(T7(-2),2))	1.7130037	0.7856814	2.1802777	0.0385
D(D(T7(-3),2))	0.3839115	0.4785305	0.8022716	0.4297
D(D(T7(-4),2))	0.0161504	0.1917437	0.0842291	0.9335
D(T7(-1),2)	-5.4239444	1.2427509	-4.3644663	0.0002
C	-0.2243162	0.2191296	-1.0236691	0.3154
TREND	0.0035011	0.0033924	1.0320170	0.3116

R-squared	0.982970	Mean of dependent var	-0.035865

```
Adjusted R-squared         0.979039    S.D. of dependent var      1.256203
S.E. of regression         0.181870    Sum of squared resid       0.859997
Log likelihood             13.35605    F-statistic                250.1122
Durbin-Watson stat         2.014100    Prob(F-statistic)          0.000000

LS // Dependent Variable is D(D(T8,2))
    Date: 10-08-1997 / Time: 14:59
    SMPL range: 1987.4 - 1995.4
    Number of observations: 33
    Augmented Dickey-Fuller: UROOT(T,4) D(T8,2)
          VARIABLE        COEFFICIENT    STD. ERROR      T-STAT.    2-TAIL SIG.
       D(D(T8(-1),2))     3.0973065     1.0884452     2.8456248      0.0085
       D(D(T8(-2),2))     1.6567031     0.7918822     2.0921081      0.0463
       D(D(T8(-3),2))     0.4315637     0.4684891     0.9211819      0.3654
       D(D(T8(-4),2))    -0.0513460     0.1874535    -0.2739134      0.7863
        D(T8(-1),2)      -5.4664778     1.2485464    -4.3782736      0.0002
             C           -0.1200632     0.7569323    -0.1586181      0.8752
           TREND          0.0012711     0.0117000     0.1086401      0.9143

R-squared                  0.957954    Mean of dependent var     -0.052732
Adjusted R-squared         0.948251    S.D. of dependent var      2.799565
S.E. of regression         0.636859    Sum of squared resid       10.54533
Log likelihood            -28.00136    F-statistic                98.72741
Durbin-Watson stat         2.001546    Prob(F-statistic)          0.000000

LS // Dependent Variable is D(D(T9))
    Date: 10-08-1997 / Time: 15:00
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(T9)
          VARIABLE        COEFFICIENT    STD. ERROR      T-STAT.    2-TAIL SIG.
        D(D(T9(-1)))      0.9874370     0.4428523     2.2297210      0.0291
        D(D(T9(-2)))      0.2855143     0.3322921     0.8592269      0.3933
        D(D(T9(-3)))     -0.2165965     0.2119658    -1.0218465      0.3105
        D(D(T9(-4)))      0.0617914     0.1225657     0.5041489      0.6158
         D(T9(-1))       -2.4405159     0.4982912    -4.8977701      0.0000
             C           -0.0278517     0.1061622    -0.2623506      0.7939
           TREND          0.0024476     0.0022125     1.1062418      0.2726

R-squared                  0.948222    Mean of dependent var     -0.028219
Adjusted R-squared         0.943586    S.D. of dependent var      1.692375
S.E. of regression         0.401968    Sum of squared resid       10.82577
Log likelihood            -33.88241    F-statistic                204.4991
Durbin-Watson stat         2.017438    Prob(F-statistic)          0.000000

LS // Dependent Variable is D(D(T10))
    Date: 10-08-1997 / Time: 15:01
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(T10)
          VARIABLE        COEFFICIENT    STD. ERROR      T-STAT.    2-TAIL SIG.
       D(D(T10(-1)))      0.2239177     0.3517157     0.6366441      0.5265
       D(D(T10(-2)))     -0.2145886     0.2648492    -0.8102295      0.4207
       D(D(T10(-3)))     -0.5708233     0.1790830    -3.1874786      0.0022
       D(D(T10(-4)))     -0.0461669     0.1176213    -0.3925044      0.6959
         D(T10(-1))      -1.6295372     0.3904017    -4.1740012      0.0001
             C           -0.0404578     0.1025575    -0.3944890      0.6945
           TREND          0.0009614     0.0021046     0.4568283      0.6493

R-squared                  0.941235    Mean of dependent var     -0.028241
Adjusted R-squared         0.935972    S.D. of dependent var      1.509334
S.E. of regression         0.381917    Sum of squared resid       9.772659
Log likelihood            -30.09582    F-statistic                178.8555
Durbin-Watson stat         2.013470    Prob(F-statistic)          0.000000

LS // Dependent Variable is D(D(T11))
    Date: 10-08-1997 / Time: 15:01
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(T11)
          VARIABLE        COEFFICIENT    STD. ERROR      T-STAT.    2-TAIL SIG.
       D(D(T11(-1)))      0.2205094     0.3734828     0.5904139      0.5569
       D(D(T11(-2)))     -0.2127531     0.2864426    -0.7427424      0.4602
       D(D(T11(-3)))     -0.4535475     0.1940722    -2.3370044      0.0224
       D(D(T11(-4)))     -0.0252339     0.1240440    -0.2034273      0.8394
         D(T11(-1))      -1.5024603     0.4124999    -3.6423291      0.0005
             C            0.0840435     0.0808425     1.0395960      0.3023
           TREND         -0.0014397     0.0016427    -0.8764301      0.3839

R-squared                  0.835884    Mean of dependent var     -0.006558
Adjusted R-squared         0.821187    S.D. of dependent var      0.681585
```

S.E. of regression	0.288217	Sum of squared resid	5.565638
Log likelihood	-9.265673	F-statistic	56.87454
Durbin-Watson stat	1.977447	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(T12))
Date: 10-08-1997 / Time: 15:02
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(T12)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(T12(-1)))	0.1100251	0.3706241	0.2968644	0.7675
D(D(T12(-2)))	-0.5360077	0.2826020	-1.8966872	0.0622
D(D(T12(-3)))	-0.6334058	0.1728871	-3.6636969	0.0005
D(D(T12(-4)))	-0.3070555	0.1039173	-2.9548046	0.0043
D(T12(-1))	-1.5248848	0.4277148	-3.5651907	0.0007
C	-0.0478291	0.0955416	-0.5006103	0.6183
TREND	0.0019145	0.0019778	0.9679958	0.3365

R-squared	0.955591	Mean of dependent var	-0.029685
Adjusted R-squared	0.951614	S.D. of dependent var	1.637369
S.E. of regression	0.360170	Sum of squared resid	8.691410
Log likelihood	-25.75744	F-statistic	240.2820
Durbin-Watson stat	1.871890	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(T13))
Date: 10-08-1997 / Time: 15:02
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(T13)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(T13(-1)))	0.5605086	0.4279678	1.3096979	0.1948
D(D(T13(-2)))	-0.0436979	0.3168171	-0.1379278	0.8907
D(D(T13(-3)))	-0.4970743	0.2011938	-2.4706248	0.0160
D(D(T13(-4)))	-0.1255669	0.1142816	-1.0987501	0.2758
D(T13(-1))	-2.1368758	0.4862514	-4.3945905	0.0000
C	-0.0010173	0.0877679	-0.0115912	0.9908
TREND	0.0012824	0.0017962	0.7139178	0.4778

R-squared	0.964754	Mean of dependent var	-0.033152
Adjusted R-squared	0.961598	S.D. of dependent var	1.678074
S.E. of regression	0.328843	Sum of squared resid	7.245243
Log likelihood	-19.02381	F-statistic	305.6557
Durbin-Watson stat	2.006152	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(U1))
Date: 10-08-1997 / Time: 15:03
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(U1)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(U1(-1)))	0.5025230	0.3822979	1.3144803	0.1932
D(D(U1(-2)))	-0.0517547	0.2916305	-0.1774665	0.8597
D(D(U1(-3)))	-0.3521476	0.1882707	-1.8704327	0.0658
D(D(U1(-4)))	0.0509321	0.1228833	0.4144756	0.6798
D(U1(-1))	-1.7582691	0.4249304	-4.1377815	0.0001
C	0.0130320	0.0387471	0.3363349	0.7377
TREND	-2.059E-05	0.0007934	-0.0259571	0.9794

R-squared	0.960685	Mean of dependent var	-0.016365
Adjusted R-squared	0.957164	S.D. of dependent var	0.702943
S.E. of regression	0.145487	Sum of squared resid	1.418153
Log likelihood	41.32282	F-statistic	272.8634
Durbin-Watson stat	2.036119	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(U2))
Date: 10-08-1997 / Time: 15:03
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(U2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(U2(-1)))	1.3866566	0.5503973	2.5193739	0.0141
D(D(U2(-2)))	0.4688650	0.4036031	1.1616983	0.2495
D(D(U2(-3)))	-0.2703488	0.2442930	-1.1066581	0.2724
D(D(U2(-4)))	-0.2057675	0.1141158	-1.8031464	0.0759
D(U2(-1))	-3.3499025	0.6272017	-5.3410288	0.0000
C	0.0244805	0.0300287	0.8152347	0.4178
TREND	-8.647E-05	0.0005986	-0.1444672	0.8856

R-squared	0.972620	Mean of dependent var	-0.014371
Adjusted R-squared	0.970168	S.D. of dependent var	0.628300
S.E. of regression	0.108520	Sum of squared resid	0.789025

Log likelihood	63.01638	F-statistic	396.6734
Durbin-Watson stat	2.220042	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(U3))
Date: 10-08-1997 / Time: 15:03
SMPL range: 1978.3 - 1995.4
Number of observations: 70
Augmented Dickey-Fuller: UROOT(T,4) D(U3)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(U3(-1)))	1.7059358	0.6527960	2.6132755	0.0112
D(D(U3(-2)))	0.7165652	0.4730064	1.5149166	0.1348
D(D(U3(-3)))	-0.1592059	0.2878625	-0.5530623	0.5822
D(D(U3(-4)))	-0.1677749	0.1224719	-1.3699055	0.1756
D(U3(-1))	-3.7964015	0.7436956	-5.1047791	0.0000
C	-0.0457261	0.0624289	-0.7324497	0.4666
TREND	0.0021326	0.0013236	1.6112843	0.1121

R-squared	0.961534	Mean of dependent var	-0.016958
Adjusted R-squared	0.957871	S.D. of dependent var	1.007236
S.E. of regression	0.206739	Sum of squared resid	2.692672
Log likelihood	14.70295	F-statistic	262.4718
Durbin-Watson stat	1.934845	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(U4))
Date: 10-08-1997 / Time: 15:04
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(U4)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(U4(-1)))	2.4040428	0.6266278	3.8364766	0.0003
D(D(U4(-2)))	1.2243469	0.4575621	2.6758049	0.0094
D(D(U4(-3)))	0.2105694	0.2736347	0.7695273	0.4443
D(D(U4(-4)))	0.0066201	0.1191408	0.0555656	0.9559
D(U4(-1))	-4.4654174	0.7157900	-6.2384459	0.0000
C	0.0145237	0.0390049	0.3723555	0.7108
TREND	0.0008812	0.0007946	1.1090051	0.2714

R-squared	0.959352	Mean of dependent var	-0.008734
Adjusted R-squared	0.955712	S.D. of dependent var	0.692370
S.E. of regression	0.145707	Sum of squared resid	1.422439
Log likelihood	41.21117	F-statistic	263.5528
Durbin-Watson stat	1.983326	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(U5))
Date: 10-08-1997 / Time: 15:05
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(U5)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(U5(-1)))	1.0425649	0.4521648	2.3057188	0.0242
D(D(U5(-2)))	0.5495294	0.3370119	1.6305935	0.1077
D(D(U5(-3)))	-0.0294405	0.2297925	-0.1281177	0.8984
D(D(U5(-4)))	0.1019904	0.1196159	0.8526495	0.3969
D(U5(-1))	-2.6542954	0.5114304	-5.1899444	0.0000
C	0.0433845	0.0536840	0.8081461	0.4219
TREND	0.0003188	0.0010966	0.2907139	0.7722

R-squared	0.929985	Mean of dependent var	-0.004281
Adjusted R-squared	0.923716	S.D. of dependent var	0.727531
S.E. of regression	0.200941	Sum of squared resid	2.705288
Log likelihood	17.42625	F-statistic	148.3240
Durbin-Watson stat	2.016100	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(U6))
Date: 10-08-1997 / Time: 15:05
SMPL range: 1978.3 - 1995.4
Number of observations: 70
Augmented Dickey-Fuller: UROOT(T,4) D(U6)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(U6(-1)))	1.0535445	0.5148502	2.0463127	0.0449
D(D(U6(-2)))	0.3626839	0.3818653	0.9497691	0.3459
D(D(U6(-3)))	-0.2067120	0.2409373	-0.8579491	0.3942
D(D(U6(-4)))	-0.0328197	0.1249800	-0.2625992	0.7937
D(U6(-1))	-2.7293973	0.5818628	-4.6907916	0.0000
C	0.0111590	0.0908288	0.1228570	0.9026
TREND	0.0004290	0.0018180	0.2359924	0.8142

R-squared	0.883730	Mean of dependent var	-0.009167
Adjusted R-squared	0.872656	S.D. of dependent var	0.860989
S.E. of regression	0.307246	Sum of squared resid	5.947214
Log likelihood	-13.03067	F-statistic	79.80678

Durbin-Watson stat	1.982829	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(U7))
Date: 10-08-1997 / Time: 15:05
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(U7)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(U7(-1)))	0.7518302	0.5153223	1.4589514	0.1493
D(D(U7(-2)))	0.1252307	0.3765208	0.3325997	0.7405
D(D(U7(-3)))	-0.4755983	0.2397532	-1.9836991	0.0514
D(D(U7(-4)))	-0.1448199	0.1215114	-1.1918216	0.2375
D(U7(-1))	-2.5238486	0.5775567	-4.3698719	0.0000
C	-0.0032060	0.0395228	-0.0811169	0.9356
TREND	0.0008344	0.0008219	1.0152809	0.3136

R-squared	0.960396	Mean of dependent var	-0.005674
Adjusted R-squared	0.956849	S.D. of dependent var	0.719316
S.E. of regression	0.149422	Sum of squared resid	1.495899
Log likelihood	39.34805	F-statistic	270.7910
Durbin-Watson stat	2.005358	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(U8,2))
Date: 10-08-1997 / Time: 15:06
SMPL range: 1986.4 - 1995.4
Number of observations: 37
Augmented Dickey-Fuller: UROOT(T,4) D(U8,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(U8(-1),2))	5.8572385	0.9898940	5.9170362	0.0000
D(D(U8(-2),2))	3.7308686	0.7218289	5.1686333	0.0000
D(D(U8(-3),2))	1.6555686	0.4339622	3.8150062	0.0006
D(D(U8(-4),2))	0.4799815	0.1645258	2.9173623	0.0066
D(U8(-1),2)	-8.5490735	1.1203604	-7.6306460	0.0000
C	-0.0285987	0.1743573	-0.1640237	0.8708
TREND	0.0004390	0.0027716	0.1583817	0.8752

R-squared	0.971533	Mean of dependent var	0.009988
Adjusted R-squared	0.965839	S.D. of dependent var	0.972151
S.E. of regression	0.179679	Sum of squared resid	0.968536
Log likelihood	14.89270	F-statistic	170.6403
Durbin-Watson stat	1.725223	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(I1,2))
Date: 10-08-1997 / Time: 15:07
SMPL range: 1986.4 - 1995.4
Number of observations: 37
Augmented Dickey-Fuller: UROOT(T,4) D(I1,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(I1(-1),2))	4.4916343	1.0527476	4.2665822	0.0002
D(D(I1(-2),2))	2.6233027	0.7748159	3.3857111	0.0020
D(D(I1(-3),2))	1.0224065	0.4483845	2.2802003	0.0299
D(D(I1(-4),2))	0.1567454	0.1792460	0.8744710	0.3888
D(I1(-1),2)	-6.9761539	1.2116986	-5.7573341	0.0000
C	-0.0676826	0.6825253	-0.0991649	0.9217
TREND	0.0012473	0.0108486	0.1149701	0.9092

R-squared	0.968571	Mean of dependent var	-0.012302
Adjusted R-squared	0.962285	S.D. of dependent var	3.622010
S.E. of regression	0.703405	Sum of squared resid	14.84337
Log likelihood	-35.60348	F-statistic	154.0886
Durbin-Watson stat	2.043802	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(I2))
Date: 10-08-1997 / Time: 15:07
SMPL range: 1986.3 - 1995.4
Observations excluded because of missing data.
Number of observations: 27
Augmented Dickey-Fuller: UROOT(T,4) D(I2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(I2(-1)))	3.2924456	1.1594777	2.8395937	0.0101
D(D(I2(-2)))	1.7473425	0.8498675	2.0560177	0.0531
D(D(I2(-3)))	0.5104799	0.5005969	1.0197425	0.3200
D(D(I2(-4)))	-0.0023324	0.2043478	-0.0114140	0.9910
D(I2(-1))	-5.5738539	1.3310145	-4.1876733	0.0005
C	0.1841649	0.6017212	0.3060634	0.7627
TREND	-0.0042138	0.0091651	-0.4597679	0.6506

R-squared	0.979488	Mean of dependent var	-0.451666
Adjusted R-squared	0.973334	S.D. of dependent var	3.334122
S.E. of regression	0.544455	Sum of squared resid	5.928629

Log likelihood	-17.84475	F-statistic	159.1694
Durbin-Watson stat	2.190674	Prob(F-statistic)	0.000000

2.2 EXPLANATORY VARIABLES:

2.2.1 INCOME PER CAPITA: (GDP per head, IN)

LS // Dependent Variable is D(D(IN1,2))
Date: 10-08-1997 / Time: 15:19
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(IN1,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN1(-1),2))	1.8134566	0.5533687	3.2771219	0.0017
D(D(IN1(-2),2))	0.9337036	0.4120986	2.2657285	0.0268
D(D(IN1(-3),2))	0.1412723	0.2649546	0.5331944	0.5957
D(D(IN1(-4),2))	0.0894258	0.1223216	0.7310715	0.4673
D(IN1(-1),2)	-3.7418895	0.6235515	-6.0009311	0.0000
C	0.0044519	0.0252860	0.1760633	0.8608
TREND	-8.319E-05	0.0005187	-0.1603727	0.8731

R-squared	0.924043	Mean of dependent var	0.004287
Adjusted R-squared	0.917138	S.D. of dependent var	0.322153
S.E. of regression	0.092734	Sum of squared resid	0.567575
Log likelihood	73.69222	F-statistic	133.8194
Durbin-Watson stat	1.969523	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN2))
Date: 10-08-1997 / Time: 15:17
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(IN2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN2(-1)))	0.1420106	0.2551001	0.5566859	0.5796
D(D(IN2(-2)))	0.0677163	0.2083471	0.3250170	0.7462
D(D(IN2(-3)))	-0.0490186	0.1643100	-0.2983298	0.7664
D(D(IN2(-4)))	0.3049902	0.1120301	2.7223939	0.0083
D(IN2(-1))	-1.1712510	0.2793244	-4.1931567	0.0001
C	-0.0167461	0.0212481	-0.7881212	0.4334
TREND	0.0005108	0.0004484	1.1392212	0.2587

R-squared	0.714738	Mean of dependent var	0.001771
Adjusted R-squared	0.689193	S.D. of dependent var	0.139816
S.E. of regression	0.077948	Sum of squared resid	0.407083
Log likelihood	87.50227	F-statistic	27.97869
Durbin-Watson stat	2.008500	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN3,2))
Date: 10-08-1997 / Time: 15:21
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(IN3,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN3(-1),2))	1.5780798	0.5598169	2.8189215	0.0064
D(D(IN3(-2),2))	0.7737689	0.4154285	1.8625802	0.0670
D(D(IN3(-3),2))	0.0261681	0.2660598	0.0983544	0.9219
D(D(IN3(-4),2))	0.0673702	0.1237746	0.5442977	0.5881
D(IN3(-1),2)	-3.4534594	0.6284709	-5.4950184	0.0000
C	0.0028705	0.0230588	0.1244881	0.9013
TREND	-3.971E-05	0.0004731	-0.0839440	0.9334

R-squared	0.944759	Mean of dependent var	0.005961
Adjusted R-squared	0.939737	S.D. of dependent var	0.346078
S.E. of regression	0.084957	Sum of squared resid	0.476366
Log likelihood	80.08656	F-statistic	188.1285
Durbin-Watson stat	1.978798	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN4,2))
Date: 10-08-1997 / Time: 15:21
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(IN4,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN4(-1),2))	1.6921504	0.6134109	2.7585920	0.0075
D(D(IN4(-2),2))	0.7805996	0.4558150	1.7125360	0.0915
D(D(IN4(-3),2))	0.0240750	0.2852180	0.0844090	0.9330
D(D(IN4(-4),2))	-0.0414380	0.1232098	-0.3363210	0.7377
D(IN4(-1),2)	-3.7689123	0.6922445	-5.4444816	0.0000

C	-0.0009773	0.0250820	-0.0389658	0.9690
TREND	3.522E-05	0.0005145	0.0684533	0.9456

R-squared	0.908952	Mean of dependent var	0.002986
Adjusted R-squared	0.900675	S.D. of dependent var	0.292982
S.E. of regression	0.092336	Sum of squared resid	0.562709
Log likelihood	74.00650	F-statistic	109.8156
Durbin-Watson stat	1.935815	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN5))
Date: 10-08-1997 / Time: 15:22
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(IN5)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN5(-1)))	0.7774456	0.4925830	1.5783037	0.1192
D(D(IN5(-2)))	0.2148471	0.3665868	0.5860741	0.5598
D(D(IN5(-3)))	-0.2659113	0.2393846	-1.1108121	0.2706
D(D(IN5(-4)))	-0.1431327	0.1162295	-1.2314658	0.2225
D(IN5(-1))	-2.5858376	0.5606538	-4.6121827	0.0000
C	-0.0905970	0.0530077	-1.7091300	0.0921
TREND	0.0005035	0.0010454	0.4816563	0.6316

R-squared	0.856386	Mean of dependent var	-0.001671
Adjusted R-squared	0.843525	S.D. of dependent var	0.484705
S.E. of regression	0.191734	Sum of squared resid	2.463052
Log likelihood	20.89712	F-statistic	66.58814
Durbin-Watson stat	2.014586	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN6))
Date: 10-08-1997 / Time: 15:23
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(IN6)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN6(-1)))	-0.0698815	0.2090237	-0.3343235	0.7392
D(D(IN6(-2)))	-0.0069905	0.1748344	-0.0399834	0.9682
D(D(IN6(-3)))	-0.1163969	0.1482007	-0.7854005	0.4350
D(D(IN6(-4)))	0.2796746	0.1095464	2.5530247	0.0130
D(IN6(-1))	-0.8007233	0.2206416	-3.6290676	0.0006
C	-0.0035196	0.0211279	-0.1665873	0.8682
TREND	0.0002448	0.0004402	0.5561747	0.5799

R-squared	0.667800	Mean of dependent var	0.001602
Adjusted R-squared	0.638051	S.D. of dependent var	0.131997
S.E. of regression	0.079412	Sum of squared resid	0.422523
Log likelihood	86.12488	F-statistic	22.44765
Durbin-Watson stat	1.874588	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN7))
Date: 10-08-1997 / Time: 15:24
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(IN7)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN7(-1)))	-0.1280507	0.1669267	-0.7671072	0.4457
D(D(IN7(-2)))	-0.0687354	0.1478419	-0.4649246	0.6435
D(D(IN7(-3)))	0.2023709	0.1223249	1.6543714	0.1027
D(D(IN7(-4)))	0.1236254	0.1033882	1.1957401	0.2360
D(IN7(-1))	-0.6380547	0.1741570	-3.6636747	0.0005
C	0.0133728	0.0177871	0.7518286	0.4548
TREND	-0.0003471	0.0003676	-0.9441348	0.3485

R-squared	0.419709	Mean of dependent var	0.000618
Adjusted R-squared	0.367743	S.D. of dependent var	0.082059
S.E. of regression	0.065249	Sum of squared resid	0.285246
Log likelihood	100.6619	F-statistic	8.076556
Durbin-Watson stat	2.000084	Prob(F-statistic)	0.000001

LS // Dependent Variable is D(D(IN8))
Date: 10-08-1997 / Time: 15:24
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(IN8)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN8(-1)))	-0.0885877	0.2214378	-0.4000570	0.6904
D(D(IN8(-2)))	0.0072298	0.1748241	0.0413545	0.9671
D(D(IN8(-3)))	-0.0543716	0.1360015	-0.3997866	0.6906
D(D(IN8(-4)))	0.1224423	0.0911872	1.3427569	0.1839
D(IN8(-1))	-0.9573116	0.2493239	-3.8396307	0.0003
C	0.0012242	0.0178994	0.0683936	0.9457

```
        TREND          0.0001198     0.0003694     0.3244469      0.7466

    R-squared                 0.594834    Mean of dependent var     0.001629
    Adjusted R-squared        0.558550    S.D. of dependent var     0.100717
    S.E. of regression        0.066918    Sum of squared resid      0.300030
    Log likelihood            98.79220    F-statistic               16.39404
    Durbin-Watson stat        1.939006    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(IN9))
    Date: 10-08-1997 / Time: 15:25
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(IN9)
          VARIABLE      COEFFICIENT    STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(IN9(-1)))    0.1343019     0.2043773     0.6571274      0.5134
       D(D(IN9(-2)))   -0.0326598     0.1748851    -0.1867502      0.8524
       D(D(IN9(-3)))   -0.0348179     0.1435661    -0.2425217      0.8091
       D(D(IN9(-4)))    0.2896234     0.1159065     2.4987676      0.0149
         D(IN9(-1))    -0.8312835     0.2139818    -3.8848331      0.0002
             C          0.0062669     0.0318195     0.1969511      0.8445
           TREND        0.0002789     0.0006548     0.4258504      0.6716

    R-squared                 0.518948    Mean of dependent var     0.000955
    Adjusted R-squared        0.475868    S.D. of dependent var     0.165287
    S.E. of regression        0.119662    Sum of squared resid      0.959380
    Log likelihood            55.78329    F-statistic               12.04634
    Durbin-Watson stat        1.992301    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(IN10))
    Date: 10-08-1997 / Time: 15:26
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(IN10)
          VARIABLE      COEFFICIENT    STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(IN10(-1)))  -0.1051797     0.2823923    -0.3724594      0.7107
       D(D(IN10(-2)))  -0.1258877     0.2270147    -0.5545354      0.5811
       D(D(IN10(-3)))  -0.3118809     0.1788535    -1.7437783      0.0858
       D(D(IN10(-4)))   0.1066267     0.1204816     0.8850041      0.3793
         D(IN10(-1))   -1.0763419     0.3086227    -3.4875656      0.0009
             C         -0.0312605     0.0301299    -1.0375241      0.3032
           TREND        0.0006409     0.0006191     1.0352679      0.3043

    R-squared                 0.819078    Mean of dependent var     0.004103
    Adjusted R-squared        0.802876    S.D. of dependent var     0.248093
    S.E. of regression        0.110150    Sum of squared resid      0.812910
    Log likelihood            61.91297    F-statistic               50.55423
    Durbin-Watson stat        1.948529    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(IN11))
    Date: 10-08-1997 / Time: 15:26
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(IN11)
          VARIABLE      COEFFICIENT    STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(IN11(-1)))  -0.0589043     0.2664916    -0.2210361      0.8257
       D(D(IN11(-2)))  -0.0979715     0.2190195    -0.4473186      0.6561
       D(D(IN11(-3)))  -0.2333941     0.1745403    -1.3371929      0.1857
       D(D(IN11(-4)))   0.2176927     0.1180752     1.8436790      0.0697
         D(IN11(-1))   -1.0057952     0.2831933    -3.5516212      0.0007
             C          0.0197679     0.0245828     0.8041358      0.4242
           TREND       -0.0001195     0.0004981    -0.2399930      0.8111

    R-squared                 0.818775    Mean of dependent var     0.000449
    Adjusted R-squared        0.802546    S.D. of dependent var     0.205589
    S.E. of regression        0.091355    Sum of squared resid      0.559164
    Log likelihood            75.75752    F-statistic               50.45115
    Durbin-Watson stat        1.957448    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(IN12))
    Date: 10-08-1997 / Time: 15:27
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(IN12)
          VARIABLE      COEFFICIENT    STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(IN12(-1)))   0.3211210     0.2156800     1.4888770      0.1412
       D(D(IN12(-2)))   0.0724536     0.1852508     0.3911109      0.6970
       D(D(IN12(-3)))   0.2674130     0.1377285     1.9415944      0.0564
       D(D(IN12(-4)))   0.0936831     0.1076439     0.8703056      0.3872
         D(IN12(-1))   -1.1707187     0.2496598    -4.6892552      0.0000
             C         -0.0891728     0.0389739    -2.2880126      0.0253
           TREND       -0.0008086     0.0007401    -1.0925217      0.2785
```

R-squared	0.526608	Mean of dependent var	-0.002108
Adjusted R-squared	0.484215	S.D. of dependent var	0.181109
S.E. of regression	0.130069	Sum of squared resid	1.133509
Log likelihood	49.61218	F-statistic	12.42196
Durbin-Watson stat	2.029732	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN13))
Date: 10-08-1997 / Time: 15:27
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(IN13)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN13(-1)))	0.0443509	0.2341408	0.1894196	0.8503
D(D(IN13(-2)))	0.0514177	0.2021360	0.2543718	0.8000
D(D(IN13(-3)))	0.0248851	0.1669200	0.1490841	0.8819
D(D(IN13(-4)))	-0.1100056	0.1203100	-0.9143517	0.3638
D(IN13(-1))	-1.0197165	0.2712341	-3.7595445	0.0004
C	0.0689492	0.0456868	1.5091705	0.1360
TREND	-0.0011725	0.0009228	-1.2705979	0.2083

R-squared	0.508948	Mean of dependent var	-0.000410
Adjusted R-squared	0.464973	S.D. of dependent var	0.222333
S.E. of regression	0.162626	Sum of squared resid	1.771973
Log likelihood	33.08150	F-statistic	11.57362
Durbin-Watson stat	2.000711	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN14,2))
Date: 10-08-1997 / Time: 15:28
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(IN14,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN14(-1),2))	1.4965986	0.5635317	2.6557486	0.0099
D(D(IN14(-2),2))	0.6528961	0.4130797	1.5805573	0.1188
D(D(IN14(-3),2))	-0.0702030	0.2569395	-0.2732276	0.7855
D(D(IN14(-4),2))	-0.0031225	0.1198929	-0.0260439	0.9793
D(IN14(-1),2)	-3.3770040	0.6358730	-5.3108152	0.0000
C	-0.0020627	0.0218124	-0.0945638	0.9249
TREND	5.473E-05	0.0004472	0.1223676	0.9030

R-squared	0.915954	Mean of dependent var	0.001251
Adjusted R-squared	0.908313	S.D. of dependent var	0.265169
S.E. of regression	0.080293	Sum of squared resid	0.425496
Log likelihood	84.20847	F-statistic	119.8806
Durbin-Watson stat	1.947148	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN15,2))
Date: 10-08-1997 / Time: 15:29
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(IN15,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN15(-1),2))	1.3537048	0.5192156	2.6072113	0.0113
D(D(IN15(-2),2))	0.6101795	0.4003657	1.5240552	0.1323
D(D(IN15(-3),2))	0.2398147	0.2536662	0.9453947	0.3479
D(D(IN15(-4),2))	0.1442854	0.1186618	1.2159384	0.2283
D(IN15(-1),2)	-3.2458290	0.5829571	-5.5678695	0.0000
C	0.0021464	0.0075055	0.2859699	0.7758
TREND	-2.677E-05	0.0001537	-0.1742038	0.8622

R-squared	0.832389	Mean of dependent var	-0.000186
Adjusted R-squared	0.817152	S.D. of dependent var	0.064453
S.E. of regression	0.027561	Sum of squared resid	0.050133
Log likelihood	162.2666	F-statistic	54.62815
Durbin-Watson stat	2.037030	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(IN16)
Date: 10-08-1997 / Time: 15:29
SMPL range: 1977.2 - 1995.4
Number of observations: 75
Augmented Dickey-Fuller: UROOT(T,4) IN16

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(IN16(-1))	0.0627240	0.0833513	0.7525257	0.4543
D(IN16(-2))	0.0555560	0.0804663	0.6904260	0.4923
D(IN16(-3))	-0.0012238	0.0798587	-0.0153250	0.9878
D(IN16(-4))	0.7409365	0.0786577	9.4197603	0.0000
IN16(-1)	-0.1611373	0.0433335	-3.7185390	0.0004
C	0.6416853	0.1736512	3.6952539	0.0004
TREND	0.0006700	0.0003814	1.7565791	0.0835

```
    R-squared                 0.624240    Mean of dependent var     0.005090
    Adjusted R-squared        0.591085    S.D. of dependent var     0.102275
    S.E. of regression        0.065401    Sum of squared resid      0.290858
    Log likelihood            101.7950    F-statistic               18.82778
    Durbin-Watson stat        1.646193    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(IN17,2))
    Date: 10-08-1997 / Time: 15:30
    SMPL range: 1977.4 - 1995.4
    Number of observations: 73
    Augmented Dickey-Fuller: UROOT(T,4) D(IN17,2)
          VARIABLE       COEFFICIENT    STD. ERROR      T-STAT.   2-TAIL SIG.
      D(D(IN17(-1),2))   0.6822620     0.3514973      1.9410164     0.0565
      D(D(IN17(-2),2))   0.4270670     0.2845062      1.5010816     0.1381
      D(D(IN17(-3),2))   0.2832395     0.2052919      1.3796917     0.1723
      D(D(IN17(-4),2))   0.1668838     0.1192469      1.3994821     0.1664
       D(IN17(-1),2)    -2.0845660     0.4028050     -5.1751242     0.0000
             C          -0.0112279     0.0298552     -0.3760770     0.7081
           TREND         0.0002954     0.0006139      0.4812628     0.6319

    R-squared                 0.687179    Mean of dependent var     0.002250
    Adjusted R-squared        0.658740    S.D. of dependent var     0.187278
    S.E. of regression        0.109403    Sum of squared resid      0.789954
    Log likelihood            61.62527    F-statistic               24.16383
    Durbin-Watson stat        1.964350    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(IN18,2))
    Date: 10-08-1997 / Time: 15:31
    SMPL range: 1977.4 - 1995.4
    Number of observations: 73
    Augmented Dickey-Fuller: UROOT(T,4) D(IN18,2)
          VARIABLE       COEFFICIENT    STD. ERROR      T-STAT.   2-TAIL SIG.
      D(D(IN18(-1),2))   1.0680717     0.4618312      2.3126884     0.0239
      D(D(IN18(-2),2))   0.4633921     0.3603742      1.2858635     0.2030
      D(D(IN18(-3),2))   0.1311313     0.2373609      0.5524552     0.5825
      D(D(IN18(-4),2))   0.0761084     0.1241561      0.6130055     0.5420
       D(IN18(-1),2)    -2.6971762     0.5236092     -5.1511250     0.0000
             C          -0.0011278     0.0180919     -0.0623345     0.9505
           TREND         4.364E-05     0.0003709      0.1176642     0.9067

    R-squared                 0.759418    Mean of dependent var    -0.000319
    Adjusted R-squared        0.737547    S.D. of dependent var     0.130306
    S.E. of regression        0.066756    Sum of squared resid      0.294121
    Log likelihood            97.68670    F-statistic               34.72245
    Durbin-Watson stat        2.025892    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(IN19))
    Date: 10-08-1997 / Time: 15:31
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(IN19)
          VARIABLE       COEFFICIENT    STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(IN19(-1)))    0.1069043     0.2261672      0.4726779     0.6380
       D(D(IN19(-2)))   -0.0395106     0.2014227     -0.1961576     0.8451
       D(D(IN19(-3)))    0.1026387     0.1647206      0.6231077     0.5353
       D(D(IN19(-4)))    0.2465905     0.1248027      1.9758437     0.0523
         D(IN19(-1))    -0.9301686     0.2418389     -3.8462329     0.0003
             C           0.0183438     0.0176434      1.0397001     0.3022
           TREND        -8.618E-06     0.0003554     -0.0242520     0.9807

    R-squared                 0.500983    Mean of dependent var    -0.000980
    Adjusted R-squared        0.456295    S.D. of dependent var     0.088249
    S.E. of regression        0.065071    Sum of squared resid      0.283697
    Log likelihood            100.8634    F-statistic               11.21065
    Durbin-Watson stat        2.066198    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(IN20,2))
    Date: 10-08-1997 / Time: 15:32
    SMPL range: 1977.4 - 1995.4
    Number of observations: 73
    Augmented Dickey-Fuller: UROOT(T,4) D(IN20,2)
          VARIABLE       COEFFICIENT    STD. ERROR      T-STAT.   2-TAIL SIG.
      D(D(IN20(-1),2))   1.1901590     0.5096207      2.3353820     0.0226
      D(D(IN20(-2),2))   0.5426081     0.3896069      1.3927066     0.1684
      D(D(IN20(-3),2))   0.0807787     0.2544166      0.3175055     0.7519
      D(D(IN20(-4),2))   0.0361063     0.1223532      0.2950987     0.7688
       D(IN20(-1),2)    -3.0086412     0.5760080     -5.2232628     0.0000
             C          -0.0004783     0.0039593     -0.1207989     0.9042
           TREND         5.853E-06     8.115E-05      0.0721271     0.9427

    R-squared                 0.820200    Mean of dependent var    -0.000202
```

Adjusted R-squared	0.803855	S.D. of dependent var	0.032988
S.E. of regression	0.014610	Sum of squared resid	0.014088
Log likelihood	208.5989	F-statistic	50.17911
Durbin-Watson stat	2.004993	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN21))
Date: 10-08-1997 / Time: 15:32
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(IN21)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN21(-1)))	0.1056613	0.2130052	0.4960502	0.6215
D(D(IN21(-2)))	-0.0861478	0.1919931	-0.4487027	0.6551
D(D(IN21(-3)))	0.1143045	0.1508226	0.7578741	0.4512
D(D(IN21(-4)))	0.1262123	0.1197918	1.0535973	0.2959
D(IN21(-1))	-0.8832555	0.2319946	-3.8072252	0.0003
C	0.0077534	0.0160435	0.4832733	0.6305
TREND	-0.0001107	0.0003299	-0.3357311	0.7381

R-squared	0.479235	Mean of dependent var	-5.27E-05
Adjusted R-squared	0.432599	S.D. of dependent var	0.080294
S.E. of regression	0.060482	Sum of squared resid	0.245093
Log likelihood	106.2754	F-statistic	10.27614
Durbin-Watson stat	1.977286	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(IN22))
Date: 10-08-1997 / Time: 15:33
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(IN22)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(IN22(-1)))	0.0934205	0.1671173	0.5590119	0.5780
D(D(IN22(-2)))	-0.1560197	0.1439185	-1.0840834	0.2822
D(D(IN22(-3)))	0.1345340	0.1185560	1.1347715	0.2605
D(D(IN22(-4)))	0.0288866	0.0939926	0.3073287	0.7595
D(IN22(-1))	-0.6641432	0.1827742	-3.6336824	0.0005
C	6.010E-05	0.0170879	0.0035173	0.9972
TREND	5.250E-05	0.0003529	0.1487628	0.8822

R-squared	0.409716	Mean of dependent var	0.001630
Adjusted R-squared	0.356855	S.D. of dependent var	0.079171
S.E. of regression	0.063493	Sum of squared resid	0.270097
Log likelihood	102.6810	F-statistic	7.750791
Durbin-Watson stat	1.977024	Prob(F-statistic)	0.000002

LS // Dependent Variable is D(IN23)
Date: 10-08-1997 / Time: 15:33
SMPL range: 1979.2 - 1995.4
Number of observations: 67
Augmented Dickey-Fuller: UROOT(T,4) IN23

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(IN23(-1))	0.2006498	0.1897550	1.0574152	0.2946
D(IN23(-2))	0.0489294	0.1584278	0.3088435	0.7585
D(IN23(-3))	-0.0594934	0.1314503	-0.4525922	0.6525
D(IN23(-4))	0.5067957	0.1129875	4.4854130	0.0000
IN23(-1)	-0.7616089	0.1909790	-3.9879187	0.0002
C	-0.5090906	0.2253646	-2.2589641	0.0275
TREND	0.0047732	0.0038936	1.2258862	0.2250

R-squared	0.665451	Mean of dependent var	-0.008443
Adjusted R-squared	0.631996	S.D. of dependent var	0.989130
S.E. of regression	0.600039	Sum of squared resid	21.60280
Log likelihood	-57.15125	F-statistic	19.89098
Durbin-Watson stat	2.220346	Prob(F-statistic)	0.000000

2.2.2 COST OF LIVING: (CL)

LS // Dependent Variable is D(D(CL1,2))
Date: 10-08-1997 / Time: 15:42
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL1,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL1(-1),2))	1.2889434	0.5046288	2.5542405	0.0130
D(D(CL1(-2),2))	0.5714205	0.3916461	1.4590226	0.1493
D(D(CL1(-3),2))	0.1781617	0.2510034	0.7097979	0.4803
D(D(CL1(-4),2))	0.0719119	0.1247288	0.5765462	0.5662
D(CL1(-1),2)	-3.0533657	0.5717252	-5.3406178	0.0000
C	0.0028952	0.0186177	0.1555051	0.8769

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
TREND	-3.453E-05	0.0003822	-0.0903581	0.9283

R-squared	0.791864	Mean of dependent var	-0.000459
Adjusted R-squared	0.772943	S.D. of dependent var	0.144000
S.E. of regression	0.068617	Sum of squared resid	0.310743
Log likelihood	95.68008	F-statistic	41.85016
Durbin-Watson stat	1.994592	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL2,2))
Date: 10-08-1997 / Time: 15:43
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL2,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL2(-1),2))	1.0981898	0.5063021	2.1690406	0.0337
D(D(CL2(-2),2))	0.4184965	0.3912755	1.0695698	0.2887
D(D(CL2(-3),2))	0.0409039	0.2517820	0.1624574	0.8714
D(D(CL2(-4),2))	0.0058820	0.1257570	0.0467727	0.9628
D(CL2(-1),2)	-2.8603492	0.5729021	-4.9927367	0.0000
C	-0.0008997	0.0185218	-0.0485769	0.9614
TREND	3.431E-05	0.0003800	0.0903067	0.9283

R-squared	0.792308	Mean of dependent var	-0.000199
Adjusted R-squared	0.773427	S.D. of dependent var	0.143558
S.E. of regression	0.068333	Sum of squared resid	0.308180
Log likelihood	95.98230	F-statistic	41.96311
Durbin-Watson stat	1.996728	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL3))
Date: 10-08-1997 / Time: 15:43
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL3)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL3(-1)))	0.1152131	0.2092194	0.5506809	0.5837
D(D(CL3(-2)))	0.0038615	0.1873734	0.0206085	0.9836
D(D(CL3(-3)))	0.1473444	0.1500146	0.9822002	0.3295
D(D(CL3(-4)))	0.2291697	0.1168345	1.9614898	0.0540
D(CL3(-1))	-0.9177368	0.2255659	-4.0685974	0.0001
C	-0.0153122	0.0166514	-0.9195747	0.3611
TREND	0.0002338	0.0003376	0.6923108	0.4911

R-squared	0.482164	Mean of dependent var	0.000514
Adjusted R-squared	0.435791	S.D. of dependent var	0.080919
S.E. of regression	0.060782	Sum of squared resid	0.247524
Log likelihood	105.9101	F-statistic	10.39743
Durbin-Watson stat	1.890168	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL4,2))
Date: 10-08-1997 / Time: 15:44
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL4,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL4(-1),2))	2.6400451	0.5801435	4.5506763	0.0000
D(D(CL4(-2),2))	1.5109176	0.4451919	3.3938571	0.0012
D(D(CL4(-3),2))	0.7246419	0.2710914	2.6730539	0.0095
D(D(CL4(-4),2))	0.2864262	0.1228214	2.3320556	0.0228
D(CL4(-1),2)	-4.7505551	0.6529201	-7.2758603	0.0000
C	0.0031561	0.0061570	0.5126009	0.6099
TREND	-2.819E-05	0.0001261	-0.2236719	0.8237

R-squared	0.866231	Mean of dependent var	-0.000715
Adjusted R-squared	0.854070	S.D. of dependent var	0.059221
S.E. of regression	0.022623	Sum of squared resid	0.033779
Log likelihood	176.6783	F-statistic	71.23127
Durbin-Watson stat	1.954313	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL5))
Date: 10-08-1997 / Time: 15:44
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL5)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL5(-1)))	0.0466766	0.1896702	0.2460934	0.8064
D(D(CL5(-2)))	-0.1199689	0.1745443	-0.6873263	0.4942
D(D(CL5(-3)))	0.0770418	0.1450755	0.5310465	0.5971
D(D(CL5(-4)))	0.1667155	0.1214305	1.3729302	0.1744
D(CL5(-1))	-0.7008408	0.1970210	-3.5571886	0.0007
C	0.0042963	0.0265001	0.1621241	0.8717
TREND	0.0002219	0.0005468	0.4057667	0.6862

```
    R-squared                  0.424476    Mean of dependent var    -0.000563
    Adjusted R-squared         0.372936    S.D. of dependent var     0.126197
    S.E. of regression         0.099932    Sum of squared resid      0.669087
    Log likelihood             69.11710    F-statistic               8.235929
    Durbin-Watson stat         2.019568    Prob(F-statistic)         0.000001

LS // Dependent Variable is D(D(CL6,2))
    Date: 10-08-1997 / Time: 15:45
    SMPL range: 1977.4 - 1995.4
    Number of observations: 73
    Augmented Dickey-Fuller: UROOT(T,4) D(CL6,2)
          VARIABLE        COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
      D(D(CL6(-1),2))      1.0523047    0.5757988     1.8275562     0.0721
      D(D(CL6(-2),2))      0.3577871    0.4286571     0.8346696     0.4069
      D(D(CL6(-3),2))     -0.2538292    0.2753024    -0.9220015     0.3599
      D(D(CL6(-4),2))     -0.1073183    0.1243561    -0.8629919     0.3913
        D(CL6(-1),2)      -3.0471810    0.6491827    -4.6938726     0.0000
             C             0.0008010    0.0015782     0.5075697     0.6134
           TREND          -1.227E-05    3.237E-05    -0.3789419     0.7059

    R-squared                  0.955931    Mean of dependent var    -0.000492
    Adjusted R-squared         0.951924    S.D. of dependent var     0.026545
    S.E. of regression         0.005820    Sum of squared resid      0.002236
    Log likelihood             275.7843    F-statistic               238.6059
    Durbin-Watson stat         1.964621    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(CL7))
    Date: 10-08-1997 / Time: 15:46
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(CL7)
          VARIABLE        COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(CL7(-1)))       0.0697822    0.2045351     0.3411745     0.7340
       D(D(CL7(-2)))      -0.0899743    0.1882669    -0.4779082     0.6343
       D(D(CL7(-3)))       0.1586940    0.1520283     1.0438453     0.3003
       D(D(CL7(-4)))       0.0406777    0.1222258     0.3328077     0.7403
         D(CL7(-1))       -0.8505412    0.2253331    -3.7745956     0.0003
             C            -0.1277675    0.0470038    -2.7182355     0.0083
           TREND          -0.0013022    0.0008548    -1.5234432     0.1324

    R-squared                  0.469551    Mean of dependent var    -0.004563
    Adjusted R-squared         0.422048    S.D. of dependent var     0.182038
    S.E. of regression         0.138391    Sum of squared resid      1.283197
    Log likelihood             45.02285    F-statistic               9.884663
    Durbin-Watson stat         1.994834    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(CL8,2))
    Date: 10-08-1997 / Time: 15:46
    SMPL range: 1977.4 - 1995.4
    Number of observations: 73
    Augmented Dickey-Fuller: UROOT(T,4) D(CL8,2)
          VARIABLE        COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
      D(D(CL8(-1),2))      0.8832199    0.5174713     1.7067999     0.0926
      D(D(CL8(-2),2))      0.1409489    0.4025955     0.3501007     0.7274
      D(D(CL8(-3),2))     -0.1168893    0.2534511    -0.4611910     0.6462
      D(D(CL8(-4),2))     -0.1058005    0.1256092    -0.8422982     0.4027
        D(CL8(-1),2)      -2.6403585    0.5855178    -4.5094417     0.0000
             C            -0.0031505    0.0185645    -0.1697050     0.8658
           TREND           5.612E-05    0.0003810     0.1473105     0.8833

    R-squared                  0.805529    Mean of dependent var     0.001205
    Adjusted R-squared         0.787850    S.D. of dependent var     0.148320
    S.E. of regression         0.068316    Sum of squared resid      0.308025
    Log likelihood             96.00074    F-statistic               45.56374
    Durbin-Watson stat         1.931159    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(CL9,2))
    Date: 10-08-1997 / Time: 15:47
    SMPL range: 1977.4 - 1995.4
    Number of observations: 73
    Augmented Dickey-Fuller: UROOT(T,4) D(CL9,2)
          VARIABLE        COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
      D(D(CL9(-1),2))      1.0896014    0.5048090     2.1584431     0.0345
      D(D(CL9(-2),2))      0.3685610    0.3937538     0.9360189     0.3527
      D(D(CL9(-3),2))      0.0710742    0.2502145     0.2840530     0.7773
      D(D(CL9(-4),2))     -0.0120673    0.1247459    -0.0967352     0.9232
        D(CL9(-1),2)      -2.8262802    0.5728410    -4.9337947     0.0000
             C            -9.421E-05    0.0181380    -0.0051939     0.9959
           TREND           2.105E-05    0.0003725     0.0565295     0.9551
```

R-squared	0.792379	Mean of dependent var	0.000414
Adjusted R-squared	0.773504	S.D. of dependent var	0.140393
S.E. of regression	0.066815	Sum of squared resid	0.294643
Log likelihood	97.62188	F-statistic	41.98106
Durbin-Watson stat	1.983366	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL10,2))
Date: 10-08-1997 / Time: 15:48
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL10,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL10(-1),2))	0.9530899	0.5177208	1.8409339	0.0701
D(D(CL10(-2),2))	0.2372963	0.4008470	0.5919874	0.5559
D(D(CL10(-3),2))	-0.0813309	0.2542500	-0.3198857	0.7501
D(D(CL10(-4),2))	-0.0637540	0.1256348	-0.5074551	0.6135
D(CL10(-1),2)	-2.7144901	0.5848302	-4.6415011	0.0000
C	-0.0038536	0.0189827	-0.2030047	0.8398
TREND	6.700E-05	0.0003895	0.1719935	0.8640

R-squared	0.799717	Mean of dependent var	0.000948
Adjusted R-squared	0.781509	S.D. of dependent var	0.149434
S.E. of regression	0.069850	Sum of squared resid	0.322016
Log likelihood	94.37944	F-statistic	43.92216
Durbin-Watson stat	1.950591	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL11,2))
Date: 10-08-1997 / Time: 15:49
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL11,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL11(-1),2))	0.9666622	0.4560904	2.1194531	0.0378
D(D(CL11(-2),2))	0.3104261	0.3572482	0.8689368	0.3880
D(D(CL11(-3),2))	0.0551731	0.2310776	0.2387645	0.8120
D(D(CL11(-4),2))	-0.0178980	0.1231489	-0.1453362	0.8849
D(CL11(-1),2)	-2.5618926	0.5211400	-4.9159389	0.0000
C	-0.0044697	0.0169908	-0.2630692	0.7933
TREND	0.0001215	0.0003482	0.3488179	0.7283

R-squared	0.758016	Mean of dependent var	0.000397
Adjusted R-squared	0.736018	S.D. of dependent var	0.121909
S.E. of regression	0.062636	Sum of squared resid	0.258933
Log likelihood	102.3375	F-statistic	34.45758
Durbin-Watson stat	1.988604	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL12,2))
Date: 10-08-1997 / Time: 15:49
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL12,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL12(-1),2))	1.8686980	0.6008251	3.1102196	0.0028
D(D(CL12(-2),2))	0.8739179	0.4610218	1.8956109	0.0624
D(D(CL12(-3),2))	0.2388467	0.2897822	0.8242283	0.4128
D(D(CL12(-4),2))	0.0174259	0.1447031	0.1204253	0.9045
D(CL12(-1),2)	-3.8198184	0.6789585	-5.6259971	0.0000
C	-0.0050741	0.0108228	-0.4688378	0.6407
TREND	0.0001063	0.0002225	0.4774952	0.6346

R-squared	0.837403	Mean of dependent var	0.000249
Adjusted R-squared	0.822621	S.D. of dependent var	0.094431
S.E. of regression	0.039771	Sum of squared resid	0.104393
Log likelihood	135.4943	F-statistic	56.65193
Durbin-Watson stat	1.991707	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL13))
Date: 10-08-1997 / Time: 15:50
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL13)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL13(-1)))	0.2260535	0.2174209	1.0397046	0.3022
D(D(CL13(-2)))	0.0106497	0.1931024	0.0551504	0.9562
D(D(CL13(-3)))	0.1437588	0.1501383	0.9575089	0.3418
D(D(CL13(-4)))	0.2042826	0.1186592	1.7215908	0.0898
D(CL13(-1))	-0.9957162	0.2381345	-4.1813184	0.0001
C	-0.0136368	0.0161478	-0.8444953	0.4014
TREND	0.0001860	0.0003289	0.5653744	0.5737

R-squared	0.492915	Mean of dependent var	0.000477

Adjusted R-squared	0.447504	S.D. of dependent var	0.080758
S.E. of regression	0.060028	Sum of squared resid	0.241423
Log likelihood	106.8336	F-statistic	10.85461
Durbin-Watson stat	1.912134	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL14,2))
Date: 10-08-1997 / Time: 15:51
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL14,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL14(-1),2))	1.0065530	0.4669079	2.1557850	0.0348
D(D(CL14(-2),2))	0.3247069	0.3456342	0.9394524	0.3509
D(D(CL14(-3),2))	-0.1057215	0.2196042	-0.4814184	0.6318
D(D(CL14(-4),2))	-0.0898287	0.1109915	-0.8093291	0.4212
D(CL14(-1),2)	-2.7347920	0.5395113	-5.0690174	0.0000
C	-0.0026738	0.0032585	-0.8205529	0.4149
TREND	5.713E-05	6.681E-05	0.8550323	0.3956

R-squared	0.804550	Mean of dependent var	0.000381
Adjusted R-squared	0.786781	S.D. of dependent var	0.025890
S.E. of regression	0.011955	Sum of squared resid	0.009432
Log likelihood	223.2408	F-statistic	45.28024
Durbin-Watson stat	1.945718	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL15))
Date: 10-08-1997 / Time: 15:51
SMPL range: 1979.3 - 1995.4
Number of observations: 66
Augmented Dickey-Fuller: UROOT(T,4) D(CL15)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL15(-1)))	0.3625030	0.4516772	0.8025710	0.4254
D(D(CL15(-2)))	-0.0984293	0.3395370	-0.2898928	0.7729
D(D(CL15(-3)))	-0.4710442	0.2282146	-2.0640404	0.0434
D(D(CL15(-4)))	-0.0705217	0.1294304	-0.5448618	0.5879
D(CL15(-1))	-1.8809045	0.5053845	-3.7217296	0.0004
C	-0.3438410	0.2221198	-1.5479982	0.1270
TREND	-0.0018572	0.0041033	-0.4526193	0.6525

R-squared	0.865932	Mean of dependent var	-0.010349
Adjusted R-squared	0.852298	S.D. of dependent var	1.636018
S.E. of regression	0.628754	Sum of squared resid	23.32456
Log likelihood	-59.32506	F-statistic	63.51274
Durbin-Watson stat	1.990296	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL16))
Date: 10-08-1997 / Time: 15:52
SMPL range: 1979.3 - 1995.4
Number of observations: 66
Augmented Dickey-Fuller: UROOT(T,4) D(CL16)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL16(-1)))	0.5405563	0.4641007	1.1647391	0.2488
D(D(CL16(-2)))	0.0634813	0.3508188	0.1809518	0.8570
D(D(CL16(-3)))	-0.3400992	0.2374096	-1.4325419	0.1573
D(D(CL16(-4)))	-0.0121028	0.1328703	-0.0910872	0.9277
D(CL16(-1))	-2.0340557	0.5179913	-3.9268143	0.0002
C	-0.0498835	0.2170322	-0.2298437	0.8190
TREND	0.0007604	0.0042464	0.1790640	0.8585

R-squared	0.843582	Mean of dependent var	-0.010726
Adjusted R-squared	0.827675	S.D. of dependent var	1.579499
S.E. of regression	0.655682	Sum of squared resid	25.36524
Log likelihood	-62.09287	F-statistic	53.03240
Durbin-Watson stat	2.000285	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL17))
Date: 10-08-1997 / Time: 15:52
SMPL range: 1979.3 - 1995.4
Number of observations: 66
Augmented Dickey-Fuller: UROOT(T,4) D(CL17)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL17(-1)))	0.4563436	0.4310835	1.0585967	0.2941
D(D(CL17(-2)))	0.0237840	0.3267589	0.0727875	0.9422
D(D(CL17(-3)))	-0.3461781	0.2238134	-1.5467265	0.1273
D(D(CL17(-4)))	0.0143210	0.1306270	0.1096325	0.9131
D(CL17(-1))	-1.8822344	0.4800949	-3.9205461	0.0002
C	-0.0798940	0.2255169	-0.3542708	0.7244
TREND	0.0017051	0.0044178	0.3859618	0.7009

R-squared	0.837281	Mean of dependent var	-0.012313
Adjusted R-squared	0.820733	S.D. of dependent var	1.608876

S.E. of regression	0.681196	Sum of squared resid	27.37768
Log likelihood	-64.61236	F-statistic	50.59810
Durbin-Watson stat	2.011168	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL18))
Date: 10-08-1997 / Time: 15:53
SMPL range: 1979.3 - 1995.4
Number of observations: 66
Augmented Dickey-Fuller: UROOT(T,4) D(CL18)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL18(-1)))	0.4931104	0.4478805	1.1009866	0.2754
D(D(CL18(-2)))	0.0397198	0.3391024	0.1171322	0.9072
D(D(CL18(-3)))	-0.3473854	0.2310254	-1.5036678	0.1380
D(D(CL18(-4)))	0.0014819	0.1319791	0.0112283	0.9911
D(CL18(-1))	-1.9540489	0.4991531	-3.9147284	0.0002
C	-0.0671756	0.2190446	-0.3066756	0.7602
TREND	0.0010781	0.0042856	0.2515674	0.8022

R-squared	0.843027	Mean of dependent var	-0.011905
Adjusted R-squared	0.827063	S.D. of dependent var	1.591060
S.E. of regression	0.661653	Sum of squared resid	25.82930
Log likelihood	-62.69115	F-statistic	52.80999
Durbin-Watson stat	2.005038	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL19))
Date: 10-08-1997 / Time: 15:53
SMPL range: 1979.3 - 1995.4
Number of observations: 66
Augmented Dickey-Fuller: UROOT(T,4) D(CL19)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL19(-1)))	0.4421314	0.4473888	0.9882487	0.3271
D(D(CL19(-2)))	-0.0019791	0.3388731	-0.0058403	0.9954
D(D(CL19(-3)))	-0.3772972	0.2308781	-1.6341835	0.1075
D(D(CL19(-4)))	-0.0142474	0.1319537	-0.1079726	0.9144
D(CL19(-1))	-1.9083806	0.4980583	-3.8316413	0.0003
C	-0.0389115	0.2149018	-0.1810662	0.8569
TREND	0.0005892	0.0042019	0.1402269	0.8890

R-squared	0.844799	Mean of dependent var	-0.011737
Adjusted R-squared	0.829016	S.D. of dependent var	1.570975
S.E. of regression	0.649602	Sum of squared resid	24.89697
Log likelihood	-61.47795	F-statistic	53.52538
Durbin-Watson stat	2.003298	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL20))
Date: 10-08-1997 / Time: 15:54
SMPL range: 1979.3 - 1995.4
Number of observations: 66
Augmented Dickey-Fuller: UROOT(T,4) D(CL20)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL20(-1)))	0.3625030	0.4516772	0.8025710	0.4254
D(D(CL20(-2)))	-0.0984293	0.3395370	-0.2898928	0.7729
D(D(CL20(-3)))	-0.4710442	0.2282146	-2.0640404	0.0434
D(D(CL20(-4)))	-0.0705217	0.1294304	-0.5448618	0.5879
D(CL20(-1))	-1.8809045	0.5053845	-3.7217296	0.0004
C	-0.3438410	0.2221198	-1.5479982	0.1270
TREND	-0.0018572	0.0041033	-0.4526193	0.6525

R-squared	0.865932	Mean of dependent var	-0.010349
Adjusted R-squared	0.852298	S.D. of dependent var	1.636018
S.E. of regression	0.628754	Sum of squared resid	23.32456
Log likelihood	-59.32506	F-statistic	63.51274
Durbin-Watson stat	1.990296	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL21))
Date: 10-08-1997 / Time: 15:54
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL21)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL21(-1)))	0.0095534	0.2060948	0.0463544	0.9632
D(D(CL21(-2)))	-0.0877314	0.1882286	-0.4660898	0.6427
D(D(CL21(-3)))	0.0697825	0.1578891	0.4419717	0.6599
D(D(CL21(-4)))	0.1581544	0.1234219	1.2814124	0.2045
D(CL21(-1))	-0.7871774	0.2189773	-3.5947903	0.0006
C	0.0567340	0.0259781	2.1839142	0.0325
TREND	0.0007700	0.0005006	1.5381867	0.1287

R-squared	0.445332	Mean of dependent var	0.001366
Adjusted R-squared	0.395660	S.D. of dependent var	0.105397
S.E. of regression	0.081935	Sum of squared resid	0.449794

Log likelihood	83.81072	F-statistic	8.965482
Durbin-Watson stat	2.024880	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL22))
Date: 10-08-1997 / Time: 15:55
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL22)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL22(-1)))	-0.0021476	0.2083637	-0.0103072	0.9918
D(D(CL22(-2)))	-0.0958394	0.1905783	-0.5028871	0.6167
D(D(CL22(-3)))	0.0788305	0.1595250	0.4941578	0.6228
D(D(CL22(-4)))	0.1648128	0.1236246	1.3331715	0.1870
D(CL22(-1))	-0.7971080	0.2213808	-3.6006196	0.0006
C	0.0552812	0.0260040	2.1258697	0.0372
TREND	0.0008070	0.0005105	1.5807497	0.1186

R-squared	0.459489	Mean of dependent var	0.001504
Adjusted R-squared	0.411085	S.D. of dependent var	0.108326
S.E. of regression	0.083130	Sum of squared resid	0.463012
Log likelihood	82.73904	F-statistic	9.492801
Durbin-Watson stat	2.025640	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL23,2))
Date: 10-08-1997 / Time: 15:56
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL23,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL23(-1),2))	0.8611931	0.4317661	1.9945824	0.0502
D(D(CL23(-2),2))	0.3447382	0.3416267	1.0091078	0.3166
D(D(CL23(-3),2))	0.0951980	0.2307963	0.4124764	0.6813
D(D(CL23(-4),2))	0.0557610	0.1238427	0.4502566	0.6540
D(CL23(-1),2)	-2.4326245	0.4896887	-4.9676963	0.0000
C	0.0017846	0.0237372	0.0751795	0.9403
TREND	3.691E-05	0.0004859	0.0759734	0.9397

R-squared	0.737887	Mean of dependent var	0.000566
Adjusted R-squared	0.714058	S.D. of dependent var	0.163497
S.E. of regression	0.087428	Sum of squared resid	0.504477
Log likelihood	77.99374	F-statistic	30.96660
Durbin-Watson stat	2.038211	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL24))
Date: 10-08-1997 / Time: 15:56
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL24)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL24(-1)))	0.1768889	0.2415843	0.7322036	0.4666
D(D(CL24(-2)))	0.0141269	0.2089257	0.0676169	0.9463
D(D(CL24(-3)))	0.0656767	0.1632712	0.4022552	0.6888
D(D(CL24(-4)))	0.1633458	0.1204941	1.3556334	0.1798
D(CL24(-1))	-1.1095499	0.2673644	-4.1499537	0.0001
C	0.0550544	0.0231357	2.3796264	0.0202
TREND	0.0012917	0.0005387	2.3976847	0.0193

R-squared	0.518738	Mean of dependent var	0.002421
Adjusted R-squared	0.475639	S.D. of dependent var	0.106750
S.E. of regression	0.077300	Sum of squared resid	0.400347
Log likelihood	88.11963	F-statistic	12.03620
Durbin-Watson stat	1.942726	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL25))
Date: 10-08-1997 / Time: 15:56
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL25)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL25(-1)))	0.0483318	0.1845877	0.2618363	0.7943
D(D(CL25(-2)))	0.0085033	0.1646154	0.0516557	0.9590
D(D(CL25(-3)))	-0.0037181	0.1416931	-0.0262408	0.9791
D(D(CL25(-4)))	0.2201057	0.1191777	1.8468694	0.0692
D(CL25(-1))	-0.6985009	0.1908661	-3.6596378	0.0005
C	0.0146622	0.0199570	0.7346893	0.4651
TREND	0.0010360	0.0004988	2.0769126	0.0416

R-squared	0.389889	Mean of dependent var	0.002145
Adjusted R-squared	0.335252	S.D. of dependent var	0.091718
S.E. of regression	0.074780	Sum of squared resid	0.374667
Log likelihood	90.57250	F-statistic	7.136011

Durbin-Watson stat	1.963886	Prob(F-statistic)	0.000007

LS // Dependent Variable is D(D(CL26))
Date: 10-08-1997 / Time: 15:58
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL26)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL26(-1)))	-0.0302691	0.1942823	-0.1557997	0.8767
D(D(CL26(-2)))	0.0130306	0.1770740	0.0735882	0.9416
D(D(CL26(-3)))	0.0800108	0.1531352	0.5224846	0.6031
D(D(CL26(-4)))	0.2512677	0.1190644	2.1103519	0.0386
D(CL26(-1))	-0.7824059	0.2038936	-3.8373247	0.0003
C	0.0448841	0.0169603	2.6464276	0.0101
TREND	0.0008096	0.0003650	2.2181289	0.0299

R-squared	0.459294	Mean of dependent var	0.001882
Adjusted R-squared	0.410873	S.D. of dependent var	0.067637
S.E. of regression	0.051915	Sum of squared resid	0.180573
Log likelihood	117.5789	F-statistic	9.485348
Durbin-Watson stat	1.998451	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(CL27)
Date: 10-08-1997 / Time: 15:59
SMPL range: 1979.2 - 1995.4
Number of observations: 67
Augmented Dickey-Fuller: UROOT(T,4) CL27

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(CL27(-1))	0.1665602	0.1947930	0.8550624	0.3959
D(CL27(-2))	0.0184520	0.1635582	0.1128159	0.9106
D(CL27(-3))	-0.0763846	0.1359513	-0.5618525	0.5763
D(CL27(-4))	0.4678900	0.1163076	4.0228657	0.0002
CL27(-1)	-0.7485073	0.1957744	-3.8233152	0.0003
C	-3.2074126	0.8451232	-3.7952013	0.0003
TREND	-0.0042778	0.0041872	-1.0216401	0.3111

R-squared	0.640106	Mean of dependent var	-0.023298
Adjusted R-squared	0.604117	S.D. of dependent var	0.987283
S.E. of regression	0.621191	Sum of squared resid	23.15267
Log likelihood	-59.47237	F-statistic	17.78600
Durbin-Watson stat	2.174479	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL28,2))
Date: 10-08-1997 / Time: 16:00
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL28,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL28(-1),2))	0.1484334	0.3133114	0.4737566	0.6372
D(D(CL28(-2),2))	0.0432496	0.2657858	0.1627234	0.8712
D(D(CL28(-3),2))	0.0997391	0.2012488	0.4956008	0.6218
D(D(CL28(-4),2))	0.2028515	0.1210983	1.6750975	0.0986
D(CL28(-1),2)	-1.4531337	0.3448949	-4.2132650	0.0001
C	-0.0171280	0.0385586	-0.4442067	0.6583
TREND	0.0004515	0.0007946	0.5682439	0.5718

R-squared	0.679422	Mean of dependent var	0.001227
Adjusted R-squared	0.650278	S.D. of dependent var	0.239144
S.E. of regression	0.141423	Sum of squared resid	1.320037
Log likelihood	42.88468	F-statistic	23.31299
Durbin-Watson stat	1.899401	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL29,2))
Date: 10-08-1997 / Time: 16:01
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL29,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL29(-1),2))	1.1192838	0.4549868	2.4600360	0.0165
D(D(CL29(-2),2))	0.4841664	0.3595984	1.3464086	0.1828
D(D(CL29(-3),2))	0.2013980	0.2358333	0.8539847	0.3962
D(D(CL29(-4),2))	0.0518791	0.1255948	0.4130677	0.6809
D(CL29(-1),2)	-2.7121000	0.5193929	-5.2216732	0.0000
C	0.0059287	0.0231461	0.2561413	0.7986
TREND	-3.022E-05	0.0004742	-0.0637236	0.9494

R-squared	0.750165	Mean of dependent var	0.000306
Adjusted R-squared	0.727452	S.D. of dependent var	0.163383
S.E. of regression	0.085296	Sum of squared resid	0.480177
Log likelihood	79.79564	F-statistic	33.02902
Durbin-Watson stat	2.008834	Prob(F-statistic)	0.000000

```
LS // Dependent Variable is D(D(CL30))
    Date: 10-08-1997 / Time: 16:02
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(CL30)
          VARIABLE        COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(CL30(-1)))      0.0644374     0.2025969     0.3180570     0.7514
       D(D(CL30(-2)))     -0.0508271     0.1844548    -0.2755532     0.7837
       D(D(CL30(-3)))      0.1243325     0.1538257     0.8082689     0.4218
       D(D(CL30(-4)))      0.1680397     0.1218141     1.3794757     0.1723
        D(CL30(-1))       -0.8272172     0.2178445    -3.7972828     0.0003
             C             0.0679377     0.0279618     2.4296639     0.0178
           TREND           0.0006702     0.0005029     1.3325606     0.1872

    R-squared                0.446569    Mean of dependent var     0.001114
    Adjusted R-squared       0.397008    S.D. of dependent var     0.110208
    S.E. of regression       0.085579    Sum of squared resid      0.490694
    Log likelihood           80.59052    F-statistic               9.010488
    Durbin-Watson stat       1.989877    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(CL31,2))
    Date: 10-08-1997 / Time: 16:02
    SMPL range: 1977.4 - 1995.4
    Number of observations: 73
    Augmented Dickey-Fuller: UROOT(T,4) D(CL31,2)
          VARIABLE        COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
      D(D(CL31(-1),2))     1.0377186     0.4425287     2.3449747     0.0220
      D(D(CL31(-2),2))     0.4872962     0.3483679     1.3987976     0.1666
      D(D(CL31(-3),2))     0.1775965     0.2333372     0.7611151     0.4493
      D(D(CL31(-4),2))     0.1003532     0.1232867     0.8139821     0.4186
       D(CL31(-1),2)      -2.6492275     0.5013335    -5.2843620     0.0000
             C            -0.0075399     0.0206471    -0.3651798     0.7161
           TREND           0.0002293     0.0004246     0.5401078     0.5909

    R-squared                0.754631    Mean of dependent var    -0.000622
    Adjusted R-squared       0.732325    S.D. of dependent var     0.147186
    S.E. of regression       0.076150    Sum of squared resid      0.382723
    Log likelihood           88.07550    F-statistic               33.83042
    Durbin-Watson stat       2.077684    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(CL32,2))
    Date: 10-08-1997 / Time: 16:03
    SMPL range: 1977.4 - 1995.4
    Number of observations: 73
    Augmented Dickey-Fuller: UROOT(T,4) D(CL32,2)
          VARIABLE        COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
      D(D(CL32(-1),2))     1.0116000     0.4476412     2.2598457     0.0271
      D(D(CL32(-2),2))     0.4372421     0.3537625     1.2359766     0.2208
      D(D(CL32(-3),2))     0.1567614     0.2355197     0.6655978     0.5080
      D(D(CL32(-4),2))     0.0756016     0.1252095     0.6038011     0.5480
       D(CL32(-1),2)      -2.5974687     0.5078283    -5.1148561     0.0000
             C             0.0021101     0.0243790     0.0865528     0.9313
           TREND           2.374E-05     0.0004999     0.0474877     0.9623

    R-squared                0.744288    Mean of dependent var     0.000734
    Adjusted R-squared       0.721042    S.D. of dependent var     0.170193
    S.E. of regression       0.089890    Sum of squared resid      0.533295
    Log likelihood           75.96608    F-statistic               32.01719
    Durbin-Watson stat       2.002185    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(CL33))
    Date: 10-08-1997 / Time: 16:04
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(CL33)
          VARIABLE        COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(CL33(-1)))      0.1404124     0.1831048     0.7668418     0.4459
       D(D(CL33(-2)))     -0.0725074     0.1689865    -0.4290721     0.6692
       D(D(CL33(-3)))      0.0968907     0.1406943     0.6886611     0.4934
       D(D(CL33(-4)))      0.1912749     0.1212741     1.5772121     0.1195
        D(CL33(-1))       -0.7096352     0.1908269    -3.7187376     0.0004
             C             0.0520388     0.0319541     1.6285511     0.1081
           TREND           0.0008710     0.0006352     1.3711811     0.1749

    R-squared                0.403318    Mean of dependent var     0.001344
    Adjusted R-squared       0.349883    S.D. of dependent var     0.135338
    S.E. of regression       0.109123    Sum of squared resid      0.797821
    Log likelihood           62.60618    F-statistic               7.547928
    Durbin-Watson stat       1.995802    Prob(F-statistic)         0.000003
```

LS // Dependent Variable is D(D(CL34))
Date: 10-08-1997 / Time: 16:04
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL34)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL34(-1)))	0.0204091	0.2041446	0.0999740	0.9207
D(D(CL34(-2)))	-0.0009818	0.1779580	-0.0055168	0.9956
D(D(CL34(-3)))	-0.0332469	0.1484956	-0.2238915	0.8235
D(D(CL34(-4)))	0.2718396	0.1104546	2.4610970	0.0164
D(CL34(-1))	-0.9870143	0.2190163	-4.5065798	0.0000
C	0.0052223	0.0027698	1.8853989	0.0637
TREND	-4.755E-05	4.909E-05	-0.9685340	0.3363

R-squared	0.618318	Mean of dependent var	-0.000280
Adjusted R-squared	0.584137	S.D. of dependent var	0.012797
S.E. of regression	0.008252	Sum of squared resid	0.004563
Log likelihood	253.6722	F-statistic	18.08979
Durbin-Watson stat	1.997101	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL35,2))
Date: 10-08-1997 / Time: 16:05
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL35,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL35(-1),2))	1.0846350	0.5129200	2.1146281	0.0382
D(D(CL35(-2),2))	0.3679883	0.3964148	0.9282911	0.3566
D(D(CL35(-3),2))	0.0040410	0.2525536	0.0160006	0.9873
D(D(CL35(-4),2))	0.0118602	0.1250206	0.0948657	0.9247
D(CL35(-1),2)	-2.8353737	0.5779534	-4.9058859	0.0000
C	-0.0029764	0.0192008	-0.1550133	0.8773
TREND	4.240E-05	0.0003938	0.1076793	0.9146

R-squared	0.800149	Mean of dependent var	0.000832
Adjusted R-squared	0.781980	S.D. of dependent var	0.151152
S.E. of regression	0.070577	Sum of squared resid	0.328751
Log likelihood	93.62388	F-statistic	44.04094
Durbin-Watson stat	1.969860	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL36,2))
Date: 10-08-1997 / Time: 16:05
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL36,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL36(-1),2))	1.0609049	0.5184432	2.0463283	0.0447
D(D(CL36(-2),2))	0.3170319	0.4016740	0.7892768	0.4328
D(D(CL36(-3),2))	-0.0195277	0.2543777	-0.0767666	0.9390
D(D(CL36(-4),2))	-0.0141517	0.1252320	-0.1130038	0.9104
D(CL36(-1),2)	-2.8304189	0.5843822	-4.8434377	0.0000
C	-0.0023336	0.0191130	-0.1220966	0.9032
TREND	3.469E-05	0.0003920	0.0884981	0.9297

R-squared	0.805562	Mean of dependent var	0.001088
Adjusted R-squared	0.787885	S.D. of dependent var	0.152563
S.E. of regression	0.070264	Sum of squared resid	0.325847
Log likelihood	93.94770	F-statistic	45.57317
Durbin-Watson stat	1.954216	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL37,2))
Date: 10-08-1997 / Time: 16:06
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL37,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL37(-1),2))	1.0319723	0.4921476	2.0968755	0.0398
D(D(CL37(-2),2))	0.3583511	0.3819061	0.9383226	0.3515
D(D(CL37(-3),2))	0.0329917	0.2455934	0.1343348	0.8935
D(D(CL37(-4),2))	0.0032988	0.1245931	0.0264769	0.9790
D(CL37(-1),2)	-2.7460245	0.5574648	-4.9259152	0.0000
C	-0.0028882	0.0184313	-0.1567021	0.8760
TREND	6.387E-05	0.0003781	0.1689228	0.8664

R-squared	0.783271	Mean of dependent var	0.000557
Adjusted R-squared	0.763568	S.D. of dependent var	0.139736
S.E. of regression	0.067946	Sum of squared resid	0.304697
Log likelihood	96.39727	F-statistic	39.75463
Durbin-Watson stat	1.994760	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL38))

Date: 10-08-1997 / Time: 16:06
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL38)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL38(-1)))	0.1126821	0.2401175	0.4692791	0.6404
D(D(CL38(-2)))	-0.0367227	0.2131090	-0.1723187	0.8637
D(D(CL38(-3)))	0.0821881	0.1730162	0.4750313	0.6363
D(D(CL38(-4)))	0.2501616	0.1266642	1.9749986	0.0524
D(CL38(-1))	-1.0040899	0.2582073	-3.8886972	0.0002
C	0.0292359	0.0182830	1.5990764	0.1145
TREND	-0.0001278	0.0003462	-0.3692436	0.7131

R-squared	0.530475	Mean of dependent var	-0.001249
Adjusted R-squared	0.488427	S.D. of dependent var	0.088777
S.E. of regression	0.063497	Sum of squared resid	0.270137
Log likelihood	102.6755	F-statistic	12.61621
Durbin-Watson stat	2.067848	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL39))
Date: 10-08-1997 / Time: 16:07
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL39)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL39(-1)))	0.0289812	0.1845976	0.1569968	0.8757
D(D(CL39(-2)))	-0.0830935	0.1722761	-0.4823275	0.6311
D(D(CL39(-3)))	0.1344653	0.1442441	0.9322069	0.3546
D(D(CL39(-4)))	0.2882083	0.1189266	2.4234136	0.0181
D(CL39(-1))	-0.6886831	0.1862234	-3.6981547	0.0004
C	-0.0037853	0.0139129	-0.2720729	0.7864
TREND	9.958E-05	0.0002880	0.3457984	0.7306

R-squared	0.477275	Mean of dependent var	0.000403
Adjusted R-squared	0.430464	S.D. of dependent var	0.069378
S.E. of regression	0.052358	Sum of squared resid	0.183668
Log likelihood	116.9500	F-statistic	10.19574
Durbin-Watson stat	1.961704	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL40,2))
Date: 10-08-1997 / Time: 16:08
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(CL40,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL40(-1),2))	1.1145840	0.4234333	2.6322544	0.0106
D(D(CL40(-2),2))	0.5285730	0.3333435	1.5856704	0.1176
D(D(CL40(-3),2))	0.2372485	0.2208873	1.0740704	0.2867
D(D(CL40(-4),2))	0.0952581	0.1114303	0.8548669	0.3957
D(CL40(-1),2)	-2.8452938	0.4810995	-5.9141483	0.0000
C	0.0135174	0.0174404	0.7750642	0.4411
TREND	-0.0002047	0.0003577	-0.5722630	0.5691

R-squared	0.813796	Mean of dependent var	0.003692
Adjusted R-squared	0.796869	S.D. of dependent var	0.142743
S.E. of regression	0.064334	Sum of squared resid	0.273167
Log likelihood	100.3842	F-statistic	48.07509
Durbin-Watson stat	1.842282	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL41))
Date: 10-08-1997 / Time: 16:08
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL41)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL41(-1)))	0.1991981	0.2155094	0.9243125	0.3586
D(D(CL41(-2)))	-0.0184564	0.1942178	-0.0950296	0.9246
D(D(CL41(-3)))	0.1985270	0.1501651	1.3220581	0.1906
D(D(CL41(-4)))	0.1409083	0.1197356	1.1768284	0.2434
D(CL41(-1))	-0.9915494	0.2395895	-4.1385347	0.0001
C	-0.0021161	0.0149389	-0.1416524	0.8878
TREND	7.556E-05	0.0003082	0.2451395	0.8071

R-squared	0.502669	Mean of dependent var	0.000211
Adjusted R-squared	0.458132	S.D. of dependent var	0.076835
S.E. of regression	0.056560	Sum of squared resid	0.214333
Log likelihood	111.2372	F-statistic	11.28652
Durbin-Watson stat	1.972374	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL42))
Date: 10-08-1997 / Time: 16:09

SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL42)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL42(-1)))	0.2332327	0.2132010	1.0939567	0.2779
D(D(CL42(-2)))	-0.0042128	0.1914642	-0.0220030	0.9825
D(D(CL42(-3)))	0.1852542	0.1478770	1.2527592	0.2146
D(D(CL42(-4)))	0.1533064	0.1193605	1.2843981	0.2034
D(CL42(-1))	-0.9856529	0.2363143	-4.1709409	0.0001
C	0.0006107	0.0152485	0.0400502	0.9682
TREND	3.706E-05	0.0003147	0.1177589	0.9066

R-squared	0.485482	Mean of dependent var	0.000308
Adjusted R-squared	0.439405	S.D. of dependent var	0.077176
S.E. of regression	0.057784	Sum of squared resid	0.223713
Log likelihood	109.6525	F-statistic	10.53648
Durbin-Watson stat	1.939154	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(CL43))
Date: 10-08-1997 / Time: 16:09
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(CL43)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(CL43(-1)))	0.0989991	0.2407245	0.4112550	0.6822
D(D(CL43(-2)))	-0.1117908	0.2118427	-0.5277067	0.5994
D(D(CL43(-3)))	0.0626582	0.1626155	0.3853149	0.7012
D(D(CL43(-4)))	0.0795970	0.1208875	0.6584388	0.5125
D(CL43(-1))	-1.0014821	0.2658724	-3.7667777	0.0004
C	0.0021436	0.0163097	0.1314285	0.8958
TREND	-2.925E-05	0.0003364	-0.0869462	0.9310

R-squared	0.523096	Mean of dependent var	7.93E-05
Adjusted R-squared	0.480388	S.D. of dependent var	0.085704
S.E. of regression	0.061779	Sum of squared resid	0.255713
Log likelihood	104.7058	F-statistic	12.24826
Durbin-Watson stat	2.041168	Prob(F-statistic)	0.000000

2.2.3 EXCHANGE RATES: (EX)

LS // Dependent Variable is D(D(EX1,2))
Date: 10-08-1997 / Time: 16:18
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX1,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX1(-1),2))	1.2511070	0.4924982	2.5403283	0.0134
D(D(EX1(-2),2))	0.4455886	0.3732805	1.1937098	0.2369
D(D(EX1(-3),2))	0.0805867	0.2312049	0.3485509	0.7285
D(D(EX1(-4),2))	-0.0585691	0.1070631	-0.5470516	0.5862
D(EX1(-1),2)	-3.1935944	0.5690443	-5.6122067	0.0000
C	0.0007112	0.0051568	0.1379088	0.8907
TREND	-3.052E-05	0.0001052	-0.2901667	0.7726

R-squared	0.842875	Mean of dependent var	5.32E-05
Adjusted R-squared	0.828591	S.D. of dependent var	0.045106
S.E. of regression	0.018675	Sum of squared resid	0.023017
Log likelihood	190.6802	F-statistic	59.00808
Durbin-Watson stat	1.885351	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX2,2))
Date: 10-08-1997 / Time: 16:19
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX2,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX2(-1),2))	1.2511070	0.4924982	2.5403283	0.0134
D(D(EX2(-2),2))	0.4455886	0.3732805	1.1937098	0.2369
D(D(EX2(-3),2))	0.0805867	0.2312049	0.3485509	0.7285
D(D(EX2(-4),2))	-0.0585691	0.1070631	-0.5470516	0.5862
D(EX2(-1),2)	-3.1935944	0.5690443	-5.6122067	0.0000
C	0.0007112	0.0051568	0.1379088	0.8907
TREND	-3.052E-05	0.0001052	-0.2901667	0.7726

R-squared	0.842875	Mean of dependent var	5.32E-05
Adjusted R-squared	0.828591	S.D. of dependent var	0.045106
S.E. of regression	0.018675	Sum of squared resid	0.023017
Log likelihood	190.6802	F-statistic	59.00808
Durbin-Watson stat	1.885351	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX3))
Date: 10-08-1997 / Time: 16:19
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX3)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX3(-1)))	0.0081577	0.2194976	0.0371654	0.9705
D(D(EX3(-2)))	-0.1741776	0.1984652	-0.8776230	0.3833
D(D(EX3(-3)))	0.0487097	0.1580506	0.3081905	0.7589
D(D(EX3(-4)))	0.1334996	0.1228457	1.0867258	0.2811
D(EX3(-1))	-0.8248971	0.2341787	-3.5225106	0.0008
C	0.0013126	0.0294008	0.0446465	0.9645
TREND	6.008E-05	0.0006069	0.0989954	0.9214

R-squared	0.508886	Mean of dependent var	-0.000663
Adjusted R-squared	0.464905	S.D. of dependent var	0.152324
S.E. of regression	0.111425	Sum of squared resid	0.831845
Log likelihood	61.06102	F-statistic	11.57074
Durbin-Watson stat	2.009551	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX4,2))
Date: 10-08-1997 / Time: 16:20
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX4,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX4(-1),2))	1.0957293	0.5198493	2.1077827	0.0389
D(D(EX4(-2),2))	0.3656576	0.4021028	0.9093635	0.3665
D(D(EX4(-3),2))	0.0056785	0.2555779	0.0222182	0.9823
D(D(EX4(-4),2))	-0.0054112	0.1252781	-0.0431939	0.9657
D(EX4(-1),2)	-2.8640975	0.5863240	-4.8848372	0.0000
C	-0.0025646	0.0195359	-0.1312769	0.8960
TREND	3.101E-05	0.0004007	0.0773935	0.9385

R-squared	0.800789	Mean of dependent var	0.000714
Adjusted R-squared	0.782679	S.D. of dependent var	0.154063
S.E. of regression	0.071821	Sum of squared resid	0.340441
Log likelihood	92.34853	F-statistic	44.21775
Durbin-Watson stat	1.966916	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX5))
Date: 10-08-1997 / Time: 16:20
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX5)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX5(-1)))	1.0972335	0.3814783	2.8762669	0.0054
D(D(EX5(-2)))	0.6357801	0.3037998	2.0927603	0.0402
D(D(EX5(-3)))	0.3765726	0.2091890	1.8001543	0.0763
D(D(EX5(-4)))	0.1169630	0.1227030	0.9532205	0.3439
D(EX5(-1))	-2.5511783	0.4452646	-5.7295783	0.0000
C	0.0087869	0.0028687	3.0630860	0.0032
TREND	-0.0001462	5.608E-05	-2.6063427	0.0113

R-squared	0.698630	Mean of dependent var	-0.000209
Adjusted R-squared	0.671642	S.D. of dependent var	0.015964
S.E. of regression	0.009148	Sum of squared resid	0.005607
Log likelihood	246.0488	F-statistic	25.88637
Durbin-Watson stat	2.036021	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX6,2))
Date: 10-08-1997 / Time: 16:21
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX6,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX6(-1),2))	1.0972343	0.5265592	2.0837815	0.0411
D(D(EX6(-2),2))	0.3355979	0.4072791	0.8239999	0.4129
D(D(EX6(-3),2))	-0.0202492	0.2564704	-0.0789535	0.9373
D(D(EX6(-4),2))	-0.0392355	0.1265328	-0.3100817	0.7575
D(EX6(-1),2)	-2.8790624	0.5952280	-4.8369067	0.0000
C	-0.0002014	0.0187134	-0.0107624	0.9914
TREND	2.619E-07	0.0003840	0.0006821	0.9995

R-squared	0.804827	Mean of dependent var	0.000332
Adjusted R-squared	0.787084	S.D. of dependent var	0.149349
S.E. of regression	0.068914	Sum of squared resid	0.313440
Log likelihood	95.36462	F-statistic	45.36034
Durbin-Watson stat	1.946695	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX7))

Date: 10-08-1997 / Time: 16:21
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX7)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX7(-1)))	0.3340715	0.2224286	1.5019267	0.1378
D(D(EX7(-2)))	0.1009354	0.2005458	0.5033033	0.6164
D(D(EX7(-3)))	0.3040092	0.1543082	1.9701431	0.0530
D(D(EX7(-4)))	0.0519405	0.1227541	0.4231265	0.6736
D(EX7(-1))	-1.1623623	0.2587693	-4.4918869	0.0000
C	0.0947287	0.0316787	2.9902912	0.0039
TREND	0.0009086	0.0005815	1.5624002	0.1229

R-squared	0.524442	Mean of dependent var	0.002253
Adjusted R-squared	0.481855	S.D. of dependent var	0.134698
S.E. of regression	0.096958	Sum of squared resid	0.629862
Log likelihood	71.35237	F-statistic	12.31453
Durbin-Watson stat	2.009312	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX8,2))
Date: 10-08-1997 / Time: 16:22
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX8,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX8(-1),2))	1.1340726	0.5117305	2.2161520	0.0301
D(D(EX8(-2),2))	0.3939658	0.3968822	0.9926517	0.3245
D(D(EX8(-3),2))	0.0444303	0.2516008	0.1765903	0.8604
D(D(EX8(-4),2))	0.0184421	0.1255148	0.1469315	0.8836
D(EX8(-1),2)	-2.8838659	0.5775865	-4.9929593	0.0000
C	0.0008311	0.0314023	0.0264668	0.9790
TREND	-1.436E-05	0.0006441	-0.0222950	0.9823

R-squared	0.799331	Mean of dependent var	-0.000447
Adjusted R-squared	0.781089	S.D. of dependent var	0.247425
S.E. of regression	0.115765	Sum of squared resid	0.884501
Log likelihood	57.49898	F-statistic	43.81677
Durbin-Watson stat	1.969962	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX9,2))
Date: 10-08-1997 / Time: 16:22
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX9,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX9(-1),2))	1.2133991	0.5021051	2.4166235	0.0184
D(D(EX9(-2),2))	0.4680971	0.3907765	1.1978641	0.2353
D(D(EX9(-3),2))	0.1235436	0.2478079	0.4985457	0.6198
D(D(EX9(-4),2))	0.0503217	0.1246352	0.4037515	0.6877
D(EX9(-1),2)	-2.9413720	0.5679185	-5.1792153	0.0000
C	-0.0015436	0.0307318	-0.0502273	0.9601
TREND	1.370E-05	0.0006305	0.0217277	0.9827

R-squared	0.794368	Mean of dependent var	-0.000143
Adjusted R-squared	0.775674	S.D. of dependent var	0.239246
S.E. of regression	0.113314	Sum of squared resid	0.847450
Log likelihood	59.06086	F-statistic	42.49351
Durbin-Watson stat	1.980744	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX10,2))
Date: 10-08-1997 / Time: 16:23
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX10,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX10(-1),2))	1.1461002	0.5088527	2.2523223	0.0276
D(D(EX10(-2),2))	0.4220452	0.3941299	1.0708277	0.2881
D(D(EX10(-3),2))	0.0592813	0.2509467	0.2362305	0.8140
D(D(EX10(-4),2))	0.0380146	0.1248735	0.3044251	0.7618
D(EX10(-1),2)	-2.8935747	0.5736936	-5.0437631	0.0000
C	0.0012285	0.0314954	0.0390048	0.9690
TREND	-2.190E-05	0.0006460	-0.0338972	0.9731

R-squared	0.798515	Mean of dependent var	-0.000522
Adjusted R-squared	0.780198	S.D. of dependent var	0.247686
S.E. of regression	0.116123	Sum of squared resid	0.889978
Log likelihood	57.27363	F-statistic	43.59468
Durbin-Watson stat	1.981499	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX11,2))
Date: 10-08-1997 / Time: 16:24

SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX11,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX11(-1),2))	1.2068349	0.4565810	2.6432002	0.0102
D(D(EX11(-2),2))	0.5147264	0.3568589	1.4423809	0.1539
D(D(EX11(-3),2))	0.1830308	0.2297401	0.7966864	0.4285
D(D(EX11(-4),2))	0.1113246	0.1227145	0.9071834	0.3676
D(EX11(-1),2)	-2.7929373	0.5183936	-5.3876772	0.0000
C	0.0034680	0.0288505	0.1202049	0.9047
TREND	-9.572E-05	0.0005914	-0.1618462	0.8719

R-squared	0.769043	Mean of dependent var	-0.000110
Adjusted R-squared	0.748046	S.D. of dependent var	0.212090
S.E. of regression	0.106458	Sum of squared resid	0.748003
Log likelihood	63.61698	F-statistic	36.62781
Durbin-Watson stat	2.037541	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX12,2))
Date: 10-08-1997 / Time: 16:25
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX12,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX12(-1),2))	1.1720849	0.4789487	2.4472037	0.0171
D(D(EX12(-2),2))	0.6815403	0.3735562	1.8244652	0.0726
D(D(EX12(-3),2))	0.2529037	0.2601488	0.9721500	0.3345
D(D(EX12(-4),2))	-0.0038989	0.1388959	-0.0280704	0.9777
D(EX12(-1),2)	-2.8936293	0.5507665	-5.2538221	0.0000
C	0.0019571	0.0119042	0.1644078	0.8699
TREND	-5.971E-05	0.0002448	-0.2439125	0.8081

R-squared	0.782728	Mean of dependent var	0.000194
Adjusted R-squared	0.762976	S.D. of dependent var	0.090075
S.E. of regression	0.043853	Sum of squared resid	0.126926
Log likelihood	128.3609	F-statistic	39.62781
Durbin-Watson stat	1.971405	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX13))
Date: 10-08-1997 / Time: 16:25
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX13)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX13(-1)))	0.4388410	0.2407988	1.8224383	0.0729
D(D(EX13(-2)))	0.2945728	0.2052742	1.4350213	0.1559
D(D(EX13(-3)))	0.2772657	0.1589037	1.7448658	0.0856
D(D(EX13(-4)))	0.1758555	0.1174421	1.4973806	0.1390
D(EX13(-1))	-1.3900494	0.2787079	-4.9874769	0.0000
C	-0.0072822	0.0082827	-0.8792050	0.3824
TREND	3.984E-05	0.0001678	0.2373628	0.8131

R-squared	0.501799	Mean of dependent var	-0.000101
Adjusted R-squared	0.457184	S.D. of dependent var	0.041590
S.E. of regression	0.030642	Sum of squared resid	0.062907
Log likelihood	156.5944	F-statistic	11.24731
Durbin-Watson stat	1.942449	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX14))
Date: 10-08-1997 / Time: 16:26
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX14)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX14(-1)))	0.0018418	0.2247513	0.0081950	0.9935
D(D(EX14(-2)))	-0.1285939	0.2015322	-0.6380810	0.5256
D(D(EX14(-3)))	0.0487507	0.1612415	0.3023460	0.7633
D(D(EX14(-4)))	0.1737983	0.1209848	1.4365301	0.1555
D(EX14(-1))	-0.8689034	0.2397024	-3.6249257	0.0006
C	-0.0049433	0.0121493	-0.4068801	0.6854
TREND	6.501E-05	0.0002497	0.2603661	0.7954

R-squared	0.516080	Mean of dependent var	0.000159
Adjusted R-squared	0.472744	S.D. of dependent var	0.062961
S.E. of regression	0.045717	Sum of squared resid	0.140035
Log likelihood	126.9858	F-statistic	11.90877
Durbin-Watson stat	2.019156	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(E9))
Date: 10-08-1997 / Time: 16:27
SMPL range: 1977.3 - 1995.4

Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(E9) Renamed as ex15

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(E9(-1)))	0.0596655	0.2332717	0.2557767	0.7989
D(D(E9(-2)))	-0.1198269	0.2097356	-0.5713234	0.5697
D(D(E9(-3)))	0.1017534	0.1643505	0.6191245	0.5379
D(D(E9(-4)))	-0.0532013	0.1219918	-0.4361053	0.6642
D(E9(-1))	-0.9689712	0.2624165	-3.6924937	0.0004
C	0.0808477	0.0329025	2.4571883	0.0166
TREND	0.0005877	0.0006048	0.9717515	0.3347

R-squared	0.534282	Mean of dependent var	0.002656
Adjusted R-squared	0.492576	S.D. of dependent var	0.145145
S.E. of regression	0.103392	Sum of squared resid	0.716227
Log likelihood	66.59799	F-statistic	12.81064
Durbin-Watson stat	1.965434	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX16,2))
Date: 10-08-1997 / Time: 16:27
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX16,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX16(-1),2))	1.6055341	0.5084786	3.1575252	0.0024
D(D(EX16(-2),2))	0.7865838	0.3969794	1.9814219	0.0517
D(D(EX16(-3),2))	0.3713351	0.2497075	1.4870802	0.1418
D(D(EX16(-4),2))	0.0456981	0.1238249	0.3690542	0.7133
D(EX16(-1),2)	-3.3928733	0.5859426	-5.7904534	0.0000
C	-0.0118186	0.0381736	-0.3096003	0.7578
TREND	0.0001831	0.0007824	0.2339994	0.8157

R-squared	0.809988	Mean of dependent var	-0.000232
Adjusted R-squared	0.792715	S.D. of dependent var	0.308458
S.E. of regression	0.140437	Sum of squared resid	1.301685
Log likelihood	43.39568	F-statistic	46.89117
Durbin-Watson stat	1.977811	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX17))
Date: 10-08-1997 / Time: 16:28
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX17)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX17(-1)))	0.3304112	0.2266524	1.4577882	0.1496
D(D(EX17(-2)))	0.0999533	0.2034529	0.4912848	0.6248
D(D(EX17(-3)))	0.2912968	0.1563411	1.8632132	0.0668
D(D(EX17(-4)))	0.0463666	0.1225455	0.3783620	0.7064
D(EX17(-1))	-1.1784542	0.2635265	-4.4718629	0.0000
C	-0.0955662	0.0320063	-2.9858529	0.0039
TREND	-0.0009308	0.0005875	-1.5842591	0.1178

R-squared	0.527282	Mean of dependent var	-0.002276
Adjusted R-squared	0.484949	S.D. of dependent var	0.136148
S.E. of regression	0.097710	Sum of squared resid	0.639660
Log likelihood	70.78126	F-statistic	12.45557
Durbin-Watson stat	2.008540	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX18))
Date: 10-08-1997 / Time: 16:28
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX18)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX18(-1)))	0.0596656	0.2332717	0.2557774	0.7989
D(D(EX18(-2)))	-0.1198267	0.2097356	-0.5713227	0.5697
D(D(EX18(-3)))	0.1017534	0.1643505	0.6191243	0.5379
D(D(EX18(-4)))	-0.0532013	0.1219918	-0.4361057	0.6642
D(EX18(-1))	-0.9689713	0.2624165	-3.6924940	0.0004
C	-0.0808477	0.0329025	-2.4571887	0.0166
TREND	-0.0005877	0.0006048	-0.9717516	0.3347

R-squared	0.534282	Mean of dependent var	-0.002656
Adjusted R-squared	0.492576	S.D. of dependent var	0.145145
S.E. of regression	0.103392	Sum of squared resid	0.716227
Log likelihood	66.59799	F-statistic	12.81064
Durbin-Watson stat	1.965434	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX19,2))
Date: 10-08-1997 / Time: 16:29
SMPL range: 1977.4 - 1995.4
Number of observations: 73

Augmented Dickey-Fuller: UROOT(T,4) D(EX19,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX19(-1),2))	1.4903527	0.5380072	2.7701352	0.0073
D(D(EX19(-2),2))	0.6205119	0.4181022	1.4841153	0.1425
D(D(EX19(-3),2))	0.2326446	0.2588781	0.8986650	0.3721
D(D(EX19(-4),2))	-0.0319195	0.1230802	-0.2593388	0.7962
D(EX19(-1),2)	-3.3523369	0.6166769	-5.4361318	0.0000
C	-0.0116794	0.0325637	-0.3586619	0.7210
TREND	0.0002039	0.0006675	0.3054931	0.7610

R-squared	0.833963	Mean of dependent var	-0.000684
Adjusted R-squared	0.818868	S.D. of dependent var	0.281389
S.E. of regression	0.119758	Sum of squared resid	0.946570
Log likelihood	55.02347	F-statistic	55.25020
Durbin-Watson stat	1.964295	Prob(F-statistic)	0.000000

E9 E9 E9 E9 E9

LS // Dependent Variable is D(D(E20))
Date: 10-08-1997 / Time: 16:30
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(E20) Renamed as ex15

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(E20(-1)))	0.2165158	0.2132347	1.0153873	0.3136
D(D(E20(-2)))	-0.0247320	0.1923827	-0.1285564	0.8981
D(D(E20(-3)))	0.1935690	0.1482856	1.3053796	0.1962
D(D(E20(-4)))	0.1356402	0.1198076	1.1321497	0.2616
D(E20(-1))	-0.9753808	0.2368591	-4.1179786	0.0001
C	0.0007477	0.0149608	0.0499749	0.9603
TREND	-5.595E-05	0.0003087	-0.1812143	0.8567

R-squared	0.494349	Mean of dependent var	-0.000260
Adjusted R-squared	0.449066	S.D. of dependent var	0.076354
S.E. of regression	0.056674	Sum of squared resid	0.215199
Log likelihood	111.0880	F-statistic	10.91706
Durbin-Watson stat	1.961407	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX21))
Date: 10-08-1997 / Time: 16:31
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX21)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX21(-1)))	0.3304112	0.2266524	1.4577882	0.1496
D(D(EX21(-2)))	0.0999533	0.2034529	0.4912848	0.6248
D(D(EX21(-3)))	0.2912968	0.1563411	1.8632132	0.0668
D(D(EX21(-4)))	0.0463666	0.1225455	0.3783620	0.7064
D(EX21(-1))	-1.1784542	0.2635265	-4.4718629	0.0000
C	-0.0955662	0.0320063	-2.9858529	0.0039
TREND	-0.0009308	0.0005875	-1.5842591	0.1178

R-squared	0.527282	Mean of dependent var	-0.002276
Adjusted R-squared	0.484949	S.D. of dependent var	0.136148
S.E. of regression	0.097710	Sum of squared resid	0.639660
Log likelihood	70.78126	F-statistic	12.45557
Durbin-Watson stat	2.008540	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX22))
Date: 10-08-1997 / Time: 16:32
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX22)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX22(-1)))	0.3340716	0.2224286	1.5019276	0.1378
D(D(EX22(-2)))	0.1009353	0.2005458	0.5033027	0.6164
D(D(EX22(-3)))	0.3040091	0.1543081	1.9701430	0.0530
D(D(EX22(-4)))	0.0519406	0.1227541	0.4231273	0.6736
D(EX22(-1))	-1.1623623	0.2587693	-4.4918871	0.0000
C	-0.0947287	0.0316787	-2.9902916	0.0039
TREND	-0.0009086	0.0005815	-1.5624003	0.1229

R-squared	0.524442	Mean of dependent var	-0.002253
Adjusted R-squared	0.481855	S.D. of dependent var	0.134697
S.E. of regression	0.096958	Sum of squared resid	0.629862
Log likelihood	71.35238	F-statistic	12.31452
Durbin-Watson stat	2.009312	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX23))

```
    Date: 10-08-1997 / Time: 16:33
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(EX23)
          VARIABLE       COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(EX23(-1)))     0.2840078     0.2162903     1.3130861     0.1936
       D(D(EX23(-2)))     0.0507159     0.1955008     0.2594153     0.7961
       D(D(EX23(-3)))     0.2559545     0.1514834     1.6896534     0.0957
       D(D(EX23(-4)))     0.0154545     0.1222070     0.1264621     0.8997
        D(EX23(-1))      -1.0727564     0.2505843    -4.2810208     0.0001
             C           -0.0687975     0.0293064    -2.3475280     0.0219
           TREND         -0.0011016     0.0006135    -1.7955631     0.0771

    R-squared                  0.499815   Mean of dependent var    -0.002547
    Adjusted R-squared         0.455022   S.D. of dependent var     0.133348
    S.E. of regression         0.098441   Sum of squared resid      0.649271
    Log likelihood             70.22942   F-statistic               11.15839
    Durbin-Watson stat         2.000002   Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(EX24,2))
    Date: 10-08-1997 / Time: 16:33
    SMPL range: 1977.4 - 1995.4
    Number of observations: 73
    Augmented Dickey-Fuller: UROOT(T,4) D(EX24,2)
          VARIABLE       COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
      D(D(EX24(-1),2))    1.6055341     0.5084786     3.1575252     0.0024
      D(D(EX24(-2),2))    0.7865838     0.3969794     1.9814219     0.0517
      D(D(EX24(-3),2))    0.3713351     0.2497075     1.4870802     0.1418
      D(D(EX24(-4),2))    0.0456981     0.1238249     0.3690542     0.7133
       D(EX24(-1),2)     -3.3928733     0.5859426    -5.7904534     0.0000
             C           -0.0118186     0.0381736    -0.3096003     0.7578
           TREND          0.0001831     0.0007824     0.2339994     0.8157

    R-squared                  0.809988   Mean of dependent var    -0.000232
    Adjusted R-squared         0.792715   S.D. of dependent var     0.308458
    S.E. of regression         0.140437   Sum of squared resid      1.301685
    Log likelihood             43.39568   F-statistic               46.89117
    Durbin-Watson stat         1.977811   Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(EX25))
    Date: 10-08-1997 / Time: 16:34
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(EX25)
          VARIABLE       COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(EX25(-1)))     0.4242495     0.2233777     1.8992474     0.0618
       D(D(EX25(-2)))     0.1624958     0.2005241     0.8103551     0.4206
       D(D(EX25(-3)))     0.3119114     0.1534853     2.0321910     0.0461
       D(D(EX25(-4)))     0.0362719     0.1225182     0.2960536     0.7681
        D(EX25(-1))      -1.2396977     0.2640263    -4.6953564     0.0000
             C           -0.0776838     0.0303148    -2.5625716     0.0126
           TREND         -0.0010825     0.0006049    -1.7896331     0.0780

    R-squared                  0.512975   Mean of dependent var    -0.002846
    Adjusted R-squared         0.469361   S.D. of dependent var     0.138027
    S.E. of regression         0.100546   Sum of squared resid      0.677337
    Log likelihood             68.66365   F-statistic               11.76166
    Durbin-Watson stat         2.005639   Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(EX26))
    Date: 10-08-1997 / Time: 16:34
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(EX26)
          VARIABLE       COEFFICIENT   STD. ERROR      T-STAT.   2-TAIL SIG.
       D(D(EX26(-1)))     0.0596656     0.2332717     0.2557774     0.7989
       D(D(EX26(-2)))    -0.1198267     0.2097356    -0.5713227     0.5697
       D(D(EX26(-3)))     0.1017534     0.1643505     0.6191243     0.5379
       D(D(EX26(-4)))    -0.0532013     0.1219918    -0.4361057     0.6642
        D(EX26(-1))      -0.9689713     0.2624165    -3.6924940     0.0004
             C           -0.0808477     0.0329025    -2.4571887     0.0166
           TREND         -0.0005877     0.0006048    -0.9717516     0.3347

    R-squared                  0.534282   Mean of dependent var    -0.002656
    Adjusted R-squared         0.492576   S.D. of dependent var     0.145145
    S.E. of regression         0.103392   Sum of squared resid      0.716227
    Log likelihood             66.59799   F-statistic               12.81064
    Durbin-Watson stat         1.965434   Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(EX28,2))
    Date: 10-08-1997 / Time: 16:35
```

```
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX28,2)
      VARIABLE        COEFFICIENT    STD. ERROR      T-STAT.    2-TAIL SIG.
  D(D(EX28(-1),2))    0.6088101     0.4498201      1.3534523     0.1805
  D(D(EX28(-2),2))    0.1274221     0.3600336      0.3539173     0.7245
  D(D(EX28(-3),2))    0.0211791     0.2419023      0.0875521     0.9305
  D(D(EX28(-4),2))   -0.0297022     0.1232113     -0.2410669     0.8103
   D(EX28(-1),2)     -2.2980395     0.5086925     -4.5175413     0.0000
         C            0.0090661     0.0399869      0.2267258     0.8213
       TREND         -0.0002884     0.0008206     -0.3514564     0.7264

R-squared                  0.779672    Mean of dependent var    -0.000609
Adjusted R-squared         0.759642    S.D. of dependent var     0.300829
S.E. of regression         0.147485    Sum of squared resid      1.435627
Log likelihood             39.82080    F-statistic               38.92551
Durbin-Watson stat         1.872664    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(EX29))
    Date: 10-08-1997 / Time: 16:35
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(EX29)
      VARIABLE        COEFFICIENT    STD. ERROR      T-STAT.    2-TAIL SIG.
   D(D(EX29(-1)))     0.3247674     0.2329519      1.3941393     0.1679
   D(D(EX29(-2)))     0.0578241     0.2070447      0.2792833     0.7809
   D(D(EX29(-3)))     0.2328982     0.1572327      1.4812323     0.1432
   D(D(EX29(-4)))    -0.0001163     0.1219413     -0.0009538     0.9992
    D(EX29(-1))      -1.1728705     0.2711006     -4.3263302     0.0001
         C           -0.0762378     0.0295851     -2.5768959     0.0122
       TREND         -0.0012116     0.0006248     -1.9390441     0.0567

R-squared                  0.527470    Mean of dependent var    -0.002968
Adjusted R-squared         0.485154    S.D. of dependent var     0.135998
S.E. of regression         0.097582    Sum of squared resid      0.637990
Log likelihood             70.87794    F-statistic               12.46500
Durbin-Watson stat         1.995879    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(EX30))
    Date: 10-08-1997 / Time: 16:36
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(EX30)
      VARIABLE        COEFFICIENT    STD. ERROR      T-STAT.    2-TAIL SIG.
   D(D(EX30(-1)))     0.3949830     0.2241210      1.7623648     0.0826
   D(D(EX30(-2)))     0.2303705     0.1997794      1.1531245     0.2530
   D(D(EX30(-3)))     0.3644090     0.1557991      2.3389675     0.0223
   D(D(EX30(-4)))     0.1764694     0.1205781      1.4635274     0.1480
    D(EX30(-1))      -1.3097204     0.2599557     -5.0382450     0.0000
         C           -0.1163944     0.0340888     -3.4144479     0.0011
       TREND         -0.0008853     0.0005972     -1.4824870     0.1429

R-squared                  0.531170    Mean of dependent var    -0.002142
Adjusted R-squared         0.489185    S.D. of dependent var     0.143101
S.E. of regression         0.102276    Sum of squared resid      0.700849
Log likelihood             67.40108    F-statistic               12.65150
Durbin-Watson stat         1.975227    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(EX31))
    Date: 10-08-1997 / Time: 16:36
    SMPL range: 1977.3 - 1995.4
    Number of observations: 74
    Augmented Dickey-Fuller: UROOT(T,4) D(EX31)
      VARIABLE        COEFFICIENT    STD. ERROR      T-STAT.    2-TAIL SIG.
   D(D(EX31(-1)))     0.1219152     0.2310136      0.5277402     0.5994
   D(D(EX31(-2)))    -0.0020476     0.2077007     -0.0098584     0.9922
   D(D(EX31(-3)))     0.2024498     0.1642132      1.2328469     0.2219
   D(D(EX31(-4)))     0.0378981     0.1223408      0.3097747     0.7577
    D(EX31(-1))      -1.0413615     0.2610199     -3.9895859     0.0002
         C           -0.0442651     0.0286130     -1.5470307     0.1266
       TREND         -0.0009961     0.0006192     -1.6087958     0.1124

R-squared                  0.525477    Mean of dependent var    -0.002191
Adjusted R-squared         0.482983    S.D. of dependent var     0.142360
S.E. of regression         0.102362    Sum of squared resid      0.702026
Log likelihood             67.33901    F-statistic               12.36576
Durbin-Watson stat         1.998778    Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(EX32))
    Date: 10-08-1997 / Time: 16:37
    SMPL range: 1977.3 - 1995.4
```

Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX32)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX32(-1)))	0.2638425	0.2207755	1.1950714	0.2363
D(D(EX32(-2)))	0.0140645	0.1996357	0.0704510	0.9440
D(D(EX32(-3)))	0.2385886	0.1537776	1.5515177	0.1255
D(D(EX32(-4)))	-0.0211564	0.1229035	-0.1721385	0.8638
D(EX32(-1))	-1.0556728	0.2562113	-4.1203206	0.0001
C	-0.0748128	0.0307035	-2.4366225	0.0175
TREND	-0.0009949	0.0006125	-1.6242561	0.1090

R-squared	0.513864	Mean of dependent var	-0.002294
Adjusted R-squared	0.470329	S.D. of dependent var	0.137339
S.E. of regression	0.099953	Sum of squared resid	0.669370
Log likelihood	69.10143	F-statistic	11.80358
Durbin-Watson stat	1.988432	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX33))
Date: 10-08-1997 / Time: 16:38
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX33)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX33(-1)))	0.3390336	0.2266789	1.4956559	0.1394
D(D(EX33(-2)))	0.1146492	0.2030628	0.5646000	0.5742
D(D(EX33(-3)))	0.2899605	0.1564003	1.8539638	0.0681
D(D(EX33(-4)))	0.0372144	0.1225264	0.3037259	0.7623
D(EX33(-1))	-1.1852768	0.2644432	-4.4821609	0.0000
C	-0.0925069	0.0317020	-2.9180120	0.0048
TREND	-0.0009977	0.0005973	-1.6702737	0.0995

R-squared	0.521262	Mean of dependent var	-0.002461
Adjusted R-squared	0.478390	S.D. of dependent var	0.136270
S.E. of regression	0.098418	Sum of squared resid	0.648969
Log likelihood	70.24667	F-statistic	12.15856
Durbin-Watson stat	2.005810	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX34))
Date: 10-08-1997 / Time: 16:38
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX34)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX34(-1)))	0.2165158	0.2132347	1.0153874	0.3136
D(D(EX34(-2)))	-0.0247320	0.1923827	-0.1285564	0.8981
D(D(EX34(-3)))	0.1935690	0.1482856	1.3053799	0.1962
D(D(EX34(-4)))	0.1356400	0.1198076	1.1321487	0.2616
D(EX34(-1))	-0.9753808	0.2368591	-4.1179786	0.0001
C	-0.0007477	0.0149608	-0.0499752	0.9603
TREND	5.595E-05	0.0003087	0.1812146	0.8567

R-squared	0.494349	Mean of dependent var	0.000260
Adjusted R-squared	0.449066	S.D. of dependent var	0.076354
S.E. of regression	0.056674	Sum of squared resid	0.215199
Log likelihood	111.0880	F-statistic	10.91706
Durbin-Watson stat	1.961407	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX35))
Date: 10-08-1997 / Time: 17:05
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX35)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX35(-1)))	0.0116985	0.2184030	0.0535639	0.9574
D(D(EX35(-2)))	-0.1544555	0.1969959	-0.7840545	0.4358
D(D(EX35(-3)))	0.0485220	0.1575197	0.3080378	0.7590
D(D(EX35(-4)))	0.1508146	0.1218897	1.2373034	0.2203
D(EX35(-1))	-0.8278115	0.2325997	-3.5589530	0.0007
C	-0.0010613	0.0295608	-0.0359024	0.9715
TREND	-6.438E-05	0.0006103	-0.1054910	0.9163

R-squared	0.503410	Mean of dependent var	0.000640
Adjusted R-squared	0.458939	S.D. of dependent var	0.152324
S.E. of regression	0.112045	Sum of squared resid	0.841123
Log likelihood	60.65058	F-statistic	11.32002
Durbin-Watson stat	2.005017	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX36))
Date: 10-08-1997 / Time: 17:06
SMPL range: 1977.3 - 1995.4
Number of observations: 74

Augmented Dickey-Fuller: UROOT(T,4) D(EX36)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX36(-1)))	0.0081577	0.2194976	0.0371651	0.9705
D(D(EX36(-2)))	-0.1741776	0.1984652	-0.8776228	0.3833
D(D(EX36(-3)))	0.0487100	0.1580507	0.3081920	0.7589
D(D(EX36(-4)))	0.1334996	0.1228457	1.0867262	0.2811
D(EX36(-1))	-0.8248971	0.2341787	-3.5225109	0.0008
C	-0.0013126	0.0294008	-0.0446466	0.9645
TREND	-6.008E-05	0.0006069	-0.0989954	0.9214

R-squared	0.508886	Mean of dependent var	0.000663
Adjusted R-squared	0.464905	S.D. of dependent var	0.152324
S.E. of regression	0.111425	Sum of squared resid	0.831845
Log likelihood	61.06102	F-statistic	11.57074
Durbin-Watson stat	2.009551	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX37))
Date: 10-08-1997 / Time: 17:06
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX37)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX37(-1)))	-0.0104048	0.2101566	-0.0495097	0.9607
D(D(EX37(-2)))	-0.1658482	0.1910287	-0.8681851	0.3884
D(D(EX37(-3)))	0.0569657	0.1538655	0.3702303	0.7124
D(D(EX37(-4)))	0.1360932	0.1216343	1.1188716	0.2672
D(EX37(-1))	-0.7751474	0.2227588	-3.4797612	0.0009
C	0.0120126	0.0293683	0.4090329	0.6838
TREND	-0.0002423	0.0006058	-0.4000321	0.6904

R-squared	0.483423	Mean of dependent var	0.000369
Adjusted R-squared	0.437162	S.D. of dependent var	0.147295
S.E. of regression	0.110504	Sum of squared resid	0.818153
Log likelihood	61.67507	F-statistic	10.44997
Durbin-Watson stat	2.004838	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX38))
Date: 10-08-1997 / Time: 17:07
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX38)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX38(-1)))	0.1164546	0.2264399	0.5142846	0.6087
D(D(EX38(-2)))	-0.0323390	0.2011061	-0.1608058	0.8727
D(D(EX38(-3)))	0.1134687	0.1605908	0.7065706	0.4823
D(D(EX38(-4)))	0.2494831	0.1208485	2.0644278	0.0429
D(EX38(-1))	-0.9640943	0.2432519	-3.9633574	0.0002
C	-0.0119597	0.0281805	-0.4243941	0.6726
TREND	2.126E-05	0.0005798	0.0366715	0.9709

R-squared	0.526145	Mean of dependent var	0.001355
Adjusted R-squared	0.483710	S.D. of dependent var	0.148110
S.E. of regression	0.106422	Sum of squared resid	0.758818
Log likelihood	64.46071	F-statistic	12.39891
Durbin-Watson stat	1.990483	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX39))
Date: 10-08-1997 / Time: 17:07
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX39)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX39(-1)))	0.1439613	0.1972163	0.7299666	0.4680
D(D(EX39(-2)))	-0.0970499	0.1825870	-0.5315268	0.5968
D(D(EX39(-3)))	0.1796445	0.1446319	1.2420807	0.2185
D(D(EX39(-4)))	0.1777105	0.1213518	1.4644244	0.1478
D(EX39(-1))	-0.8109081	0.2099646	-3.8621175	0.0003
C	0.0060055	0.0262221	0.2290256	0.8195
TREND	-7.817E-05	0.0005403	-0.1446932	0.8854

R-squared	0.492618	Mean of dependent var	-0.000244
Adjusted R-squared	0.447180	S.D. of dependent var	0.133137
S.E. of regression	0.098990	Sum of squared resid	0.656535
Log likelihood	69.81780	F-statistic	10.84172
Durbin-Watson stat	1.943530	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX40,2))
Date: 10-08-1997 / Time: 17:08
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(EX40,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX40(-1),2))	1.3187143	0.4498361	2.9315442	0.0046
D(D(EX40(-2),2))	0.6375133	0.3551404	1.7951019	0.0772
D(D(EX40(-3),2))	0.3446666	0.2285844	1.5078304	0.1364
D(D(EX40(-4),2))	0.1635333	0.1197842	1.3652330	0.1768
D(EX40(-1),2)	-2.9645985	0.5119925	-5.7903159	0.0000
C	-0.0096816	0.0313083	-0.3092354	0.7581
TREND	0.0001465	0.0006418	0.2283137	0.8201

R-squared	0.785872	Mean of dependent var	-0.002612
Adjusted R-squared	0.766405	S.D. of dependent var	0.238996
S.E. of regression	0.115510	Sum of squared resid	0.880616
Log likelihood	57.65963	F-statistic	40.37103
Durbin-Watson stat	1.954936	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(EX43))
Date: 10-08-1997 / Time: 17:08
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(EX43)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(EX43(-1)))	0.4591121	0.2675723	1.7158430	0.0908
D(D(EX43(-2)))	0.1559715	0.2250057	0.6931894	0.4906
D(D(EX43(-3)))	0.1287946	0.1670976	0.7707748	0.4436
D(D(EX43(-4)))	-0.0064631	0.1222409	-0.0528718	0.9580
D(EX43(-1))	-1.4059420	0.3142023	-4.4746394	0.0000
C	-0.0148400	0.0104297	-1.4228569	0.1594
TREND	0.0003540	0.0002177	1.6259027	0.1087

R-squared	0.521684	Mean of dependent var	0.000167
Adjusted R-squared	0.478850	S.D. of dependent var	0.052325
S.E. of regression	0.037773	Sum of squared resid	0.095598
Log likelihood	141.1103	F-statistic	12.17914
Durbin-Watson stat	2.000002	Prob(F-statistic)	0.000000

2.2.4 AIR TARIFF: (FF)

FF ADF STATISTICS (UNIT ROOT TESTS)

ADF Test Statistic	-3.608434	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF1,2)
Date: 02/15/98 Time: 10:03
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF1(-1))	-1.099110	0.304595	-3.608434	0.0006
D(FF1(-1),2)	-0.049517	0.276668	-0.178975	0.8585
D(FF1(-2),2)	-0.068711	0.233871	-0.293797	0.7698
D(FF1(-3),2)	-0.093291	0.185611	-0.502614	0.6169
D(FF1(-4),2)	0.055363	0.119743	0.462352	0.6453
C	-0.014220	0.008135	-1.747942	0.0851
@TREND(1976:1)	0.000287	0.000167	1.715498	0.0909

R-squared	0.602475	Mean dependent var	0.000588
Adjusted R-squared	0.566876	S.D. dependent var	0.039430
S.E. of regression	0.025950	Akaike info criterion	-7.213373
Sum squared resid	0.045117	Schwarz criterion	-6.995421
Log likelihood	168.8934	F-statistic	16.92381
Durbin-Watson stat	1.998824	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.127642	1% Critical Value*	-4.0871
		5% Critical Value	-3.4713
		10% Critical Value	-3.1624

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF2,3)
Date: 02/15/98 Time: 10:06
Sample(adjusted): 1977:4 1995:4
Included observations: 73 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF2(-1),2)	-2.878722	0.561412	-5.127642	0.0000
D(FF2(-1),3)	0.979705	0.499036	1.963193	0.0538
D(FF2(-2),3)	0.462766	0.382412	1.210124	0.2305
D(FF2(-3),3)	0.093603	0.253676	0.368986	0.7133
D(FF2(-4),3)	0.065758	0.118728	0.553858	0.5815
C	0.000733	0.007069	0.103682	0.9177
@TREND(1976:1)	7.80E-06	0.000147	0.052959	0.9579

R-squared	0.871107	Mean dependent var	-0.000573
Adjusted R-squared	0.859390	S.D. dependent var	0.070573
S.E. of regression	0.026463	Akaike info criterion	-7.173003
Sum squared resid	0.046221	Schwarz criterion	-6.953370
Log likelihood	165.2321	F-statistic	74.34236
Durbin-Watson stat	1.994034	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.793824	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF3,2)
Date: 02/15/98 Time: 10:08
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF3(-1))	-1.353672	0.282378	-4.793824	0.0000
D(FF3(-1),2)	0.319197	0.254462	1.254402	0.2141
D(FF3(-2),2)	0.242232	0.215107	1.126100	0.2641
D(FF3(-3),2)	0.187102	0.170313	1.098582	0.2759
D(FF3(-4),2)	0.289505	0.116506	2.484887	0.0155
C	0.000126	0.001317	0.095327	0.9243
@TREND(1976:1)	-2.13E-06	2.77E-05	-0.077002	0.9389

R-squared	0.583257	Mean dependent var	6.03E-05
Adjusted R-squared	0.545937	S.D. dependent var	0.007547
S.E. of regression	0.005085	Akaike info criterion	-10.47304
Sum squared resid	0.001733	Schwarz criterion	-10.25509
Log likelihood	289.5010	F-statistic	15.62841
Durbin-Watson stat	1.870811	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.607650	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF4,2)
Date: 02/15/98 Time: 10:09
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF4(-1))	-1.482808	0.321814	-4.607650	0.0000
D(FF4(-1),2)	0.445748	0.276454	1.612379	0.1116
D(FF4(-2),2)	0.188593	0.234361	0.804712	0.4238
D(FF4(-3),2)	0.198156	0.174380	1.136348	0.2599
D(FF4(-4),2)	0.052693	0.123056	0.428204	0.6699
C	-0.001046	0.002220	-0.471076	0.6391
@TREND(1976:1)	3.21E-05	4.70E-05	0.683294	0.4968

R-squared	0.552060	Mean dependent var	-4.69E-06
Adjusted R-squared	0.511946	S.D. dependent var	0.012141
S.E. of regression	0.008482	Akaike info criterion	-9.449814
Sum squared resid	0.004820	Schwarz criterion	-9.231862
Log likelihood	251.6417	F-statistic	13.76229
Durbin-Watson stat	2.002911	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.008562	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF5,2)
Date: 02/15/98 Time: 10:10
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF5(-1))	-0.899081	0.224290	-4.008562	0.0002
D(FF5(-1),2)	0.104408	0.211609	0.493402	0.6233
D(FF5(-2),2)	-0.048477	0.192862	-0.251357	0.8023
D(FF5(-3),2)	0.152547	0.156566	0.974332	0.3334
D(FF5(-4),2)	0.278670	0.121936	2.285369	0.0255
C	0.000397	0.003985	0.099614	0.9209
@TREND(1976:1)	5.64E-05	8.48E-05	0.665342	0.5081

R-squared	0.532930	Mean dependent var	-4.70E-05
Adjusted R-squared	0.491103	S.D. dependent var	0.021534
S.E. of regression	0.015361	Akaike info criterion	-8.261976
Sum squared resid	0.015810	Schwarz criterion	-8.044023
Log likelihood	207.6916	F-statistic	12.74126
Durbin-Watson stat	2.061152	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.817210	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF6,2)
Date: 02/15/98 Time: 10:11
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF6(-1))	-1.105340	0.289568	-3.817210	0.0003
D(FF6(-1),2)	0.065164	0.265922	0.245050	0.8072
D(FF6(-2),2)	-0.097126	0.230095	-0.422112	0.6743
D(FF6(-3),2)	0.002618	0.177669	0.014736	0.9883
D(FF6(-4),2)	0.161684	0.123240	1.311945	0.1940
C	-0.001091	0.001312	-0.831766	0.4085
@TREND(1976:1)	2.70E-05	2.78E-05	0.968918	0.3361

R-squared	0.582194	Mean dependent var	3.07E-06
Adjusted R-squared	0.544779	S.D. dependent var	0.007299
S.E. of regression	0.004924	Akaike info criterion	-10.53729
Sum squared resid	0.001625	Schwarz criterion	-10.31934
Log likelihood	291.8784	F-statistic	15.56027
Durbin-Watson stat	1.998393	Prob(F-statistic)	0.000000

ADF Test Statistic	-6.171673	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF7,2)

Date: 02/15/98 Time: 10:12
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	CoefficientStd. Errort-StatisticProb.			
D(FF7(-1))-2.418773	0.391915 -6.171673	0.0000		
D(FF7(-1),2)	1.022969	0.342705	2.984983	0.0040
D(FF7(-2),2)	0.711281	0.271713	2.617766	0.0109
D(FF7(-3),2)	0.391679	0.198794	1.970281	0.0529
D(FF7(-4),2)	0.302944	0.115555	2.621652	0.0108
C	-0.012367	0.002937	-4.210501	0.0001
@TREND(1976:1)	5.16E-05	4.77E-05	1.081747	0.2832

R-squared	0.723498	Mean dependent var	5.09E-05
Adjusted R-squared	0.698736	S.D. dependent var	0.015829
S.E. of regression	0.008688	Akaike info criterion	-9.401774
Sum squared resid	0.005057	Schwarz criterion	-9.183822
Log likelihood	249.8642	F-statistic	29.21876
Durbin-Watson stat	1.890097	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.370276	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF8,2)
Date: 02/15/98 Time: 10:13
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	CoefficientStd. Errort-StatisticProb.			
D(FF8(-1))-1.328277	0.303934 -4.370276	0.0000		
D(FF8(-1),2)	0.223252	0.269753	0.827616	0.4108
D(FF8(-2),2)	0.182278	0.225473	0.808425	0.4217
D(FF8(-3),2)	0.094109	0.178439	0.527402	0.5997
D(FF8(-4),2)	0.134998	0.119136	1.133144	0.2612
C	-0.000825	0.002405	-0.343132	0.7326
@TREND(1976:1)	1.30E-05	5.05E-05	0.257232	0.7978

R-squared	0.570835	Mean dependent var	6.00E-05
Adjusted R-squared	0.532403	S.D. dependent var	0.013546
S.E. of regression	0.009263	Akaike info criterion	-9.273693
Sum squared resid	0.005748	Schwarz criterion	-9.055741
Log likelihood	245.1252	F-statistic	14.85286
Durbin-Watson stat	1.948301	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.805188	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF9,2)
Date: 02/15/98 Time: 10:14
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	CoefficientStd. Errort-StatisticProb.			
D(FF9(-1))-1.123543	0.295266 -3.805188	0.0003		
D(FF9(-1),2)	-0.011610	0.267307	-0.043433	0.9655
D(FF9(-2),2)	0.019520	0.225107	0.086715	0.9312
D(FF9(-3),2)	-0.064173	0.181221	-0.354111	0.7244
D(FF9(-4),2)	0.121548	0.116537	1.043001	0.3007
C	-0.008226	0.003592	-2.290242	0.0252
@TREND(1976:1)	0.000140	6.98E-05	2.009241	0.0485

R-squared	0.661985	Mean dependent var	0.000284
Adjusted R-squared	0.631715	S.D. dependent var	0.017762

S.E. of regression	0.010779	Akaike info criterion	-8.970507
Sum squared resid	0.007784	Schwarz criterion	-8.752555
Log likelihood	233.9073	F-statistic	21.86931
Durbin-Watson stat	1.985723	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.712797	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF10,2)
Date: 02/15/98 Time: 10:15
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF10(-1))	-1.450763	0.307835	-4.712797	0.0000
D(FF10(-1),2)	0.328936	0.272507	1.207074	0.2316
D(FF10(-2),2)	0.246454	0.227189	1.084799	0.2819
D(FF10(-3),2)	0.168603	0.176257	0.956577	0.3422
D(FF10(-4),2)	0.196692	0.117190	1.678404	0.0979
C	-0.001759	0.002392	-0.735390	0.4647
@TREND(1976:1)	5.60E-05	5.11E-05	1.094930	0.2775

R-squared	0.584579	Mean dependent var	2.62E-05
Adjusted R-squared	0.547378	S.D. dependent var	0.013571
S.E. of regression	0.009131	Akaike info criterion	-9.302448
Sum squared resid	0.005586	Schwarz criterion	-9.084496
Log likelihood	246.1891	F-statistic	15.71373
Durbin-Watson stat	1.945563	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.860406	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF11,2)
Date: 02/15/98 Time: 10:15
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF11(-1))	-0.931934	0.241408	-3.860406	0.0003
D(FF11(-1),2)	0.044906	0.226499	0.198260	0.8434
D(FF11(-2),2)	0.025258	0.191233	0.132078	0.8953
D(FF11(-3),2)	-0.023193	0.157196	-0.147543	0.8831
D(FF11(-4),2)	0.232921	0.114689	2.030901	0.0462
C	-0.002475	0.003400	-0.728001	0.4691
@TREND(1976:1)	3.13E-05	7.04E-05	0.445010	0.6577

R-squared	0.545741	Mean dependent var	0.000133
Adjusted R-squared	0.505061	S.D. dependent var	0.018255
S.E. of regression	0.012843	Akaike info criterion	-8.620131
Sum squared resid	0.011051	Schwarz criterion	-8.402179
Log likelihood	220.9434	F-statistic	13.41550
Durbin-Watson stat	1.919088	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.605420	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF13,2)
Date: 02/15/98 Time: 10:21
Sample(adjusted): 1977:3 1995:4

Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF13(-1))	-1.152577	0.250265	-4.605420	0.0000
D(FF13(-1),2)	0.225443	0.227212	0.992213	0.3247
D(FF13(-2),2)	0.242326	0.192241	1.260533	0.2118
D(FF13(-3),2)	0.129710	0.160095	0.810207	0.4207
D(FF13(-4),2)	0.275380	0.115484	2.384574	0.0199
C	0.001609	0.003499	0.459911	0.6471
@TREND(1976:1)	-3.61E-05	7.37E-05	-0.490445	0.6254

R-squared	0.555191	Mean dependent var	0.000179
Adjusted R-squared	0.515358	S.D. dependent var	0.019372
S.E. of regression	0.013486	Akaike info criterion	-8.522330
Sum squared resid	0.012186	Schwarz criterion	-8.304378
Log likelihood	217.3248	F-statistic	13.93777
Durbin-Watson stat	1.778261	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.006560	1% Critical Value*	-4.0836
		5% Critical Value	-3.4696
		10% Critical Value	-3.1615

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF14)
Date: 02/15/98 Time: 10:22
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FF14(-1)	-0.162928	0.040665	-4.006560	0.0002
D(FF14(-1))	0.033985	0.109337	0.310831	0.7569
D(FF14(-2))	0.526276	0.107159	4.911169	0.0000
D(FF14(-3))	-0.100771	0.109937	-0.916628	0.3626
D(FF14(-4))	0.055720	0.110195	0.505651	0.6147
C	-0.009112	0.002204	-4.135051	0.0001
@TREND(1976:1)	-1.45E-05	2.65E-05	-0.546712	0.5864

R-squared	0.517759	Mean dependent var	-0.000692
Adjusted R-squared	0.475208	S.D. dependent var	0.005740
S.E. of regression	0.004158	Akaike info criterion	-10.87669
Sum squared resid	0.001176	Schwarz criterion	-10.66039
Log likelihood	308.4555	F-statistic	12.16804
Durbin-Watson stat	2.054118	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.006560	1% Critical Value*	-4.0836
		5% Critical Value	-3.4696
		10% Critical Value	-3.1615

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF20)
Date: 02/15/98 Time: 10:23
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FF20(-1)	-0.162928	0.040665	-4.006560	0.0002
D(FF20(-1))	0.033985	0.109337	0.310831	0.7569
D(FF20(-2))	0.526276	0.107159	4.911169	0.0000
D(FF20(-3))	-0.100771	0.109937	-0.916628	0.3626
D(FF20(-4))	0.055720	0.110195	0.505651	0.6147
C	-0.009112	0.002204	-4.135051	0.0001
@TREND(1976:1)	-1.45E-05	2.65E-05	-0.546712	0.5864

R-squared	0.517759	Mean dependent var	-0.000692
Adjusted R-squared	0.475208	S.D. dependent var	0.005740
S.E. of regression	0.004158	Akaike info criterion	-10.87669
Sum squared resid	0.001176	Schwarz criterion	-10.66039

Log likelihood	308.4555	F-statistic	12.16804
Durbin-Watson stat	2.054118	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.546320	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF21,2)
Date: 02/15/98 Time: 10:26
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF21(-1))	-1.158634	0.254851	-4.546320	0.0000
D(FF21(-1),2)	0.190711	0.234493	0.813290	0.4189
D(FF21(-2),2)	0.128992	0.207069	0.622944	0.5354
D(FF21(-3),2)	0.233280	0.166894	1.397776	0.1668
D(FF21(-4),2)	0.336565	0.119749	2.810596	0.0065
C	0.030863	0.022996	1.342115	0.1841
@TREND(1976:1)	0.000821	0.000511	1.607183	0.1127

R-squared	0.571288	Mean dependent var	0.001056
Adjusted R-squared	0.532896	S.D. dependent var	0.126096
S.E. of regression	0.086180	Akaike info criterion	-4.812812
Sum squared resid	0.497611	Schwarz criterion	-4.594860
Log likelihood	80.07258	F-statistic	14.88035
Durbin-Watson stat	2.047009	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.613662	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF22,2)
Date: 02/15/98 Time: 10:27
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF22(-1))	-1.155212	0.250389	-4.613662	0.0000
D(FF22(-1),2)	0.270042	0.230134	1.173411	0.2448
D(FF22(-2),2)	0.097925	0.204470	0.478922	0.6336
D(FF22(-3),2)	0.238298	0.163005	1.461909	0.1484
D(FF22(-4),2)	0.349400	0.124061	2.816347	0.0064
C	0.032925	0.022464	1.465679	0.1474
@TREND(1976:1)	0.000491	0.000470	1.043905	0.3003

R-squared	0.581390	Mean dependent var	0.001167
Adjusted R-squared	0.543902	S.D. dependent var	0.123441
S.E. of regression	0.083366	Akaike info criterion	-4.879216
Sum squared resid	0.465641	Schwarz criterion	-4.661264
Log likelihood	82.52956	F-statistic	15.50890
Durbin-Watson stat	2.061453	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.674401	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF23,2)
Date: 02/15/98 Time: 10:27
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF23(-1))	-1.124552	0.240577	-4.674401	0.0000
D(FF23(-1),2)	0.192883	0.220430	0.875031	0.3847
D(FF23(-2),2)	0.213944	0.193328	1.106638	0.2724
D(FF23(-3),2)	0.235240	0.161218	1.459144	0.1492
D(FF23(-4),2)	0.332055	0.118077	2.812179	0.0064
C	0.002408	0.025660	0.093861	0.9255
@TREND(1976:1)	0.000947	0.000582	1.626652	0.1085

R-squared	0.534661	Mean dependent var	0.001028
Adjusted R-squared	0.492989	S.D. dependent var	0.139115
S.E. of regression	0.099056	Akaike info criterion	-4.534322
Sum squared resid	0.657411	Schwarz criterion	-4.316369
Log likelihood	69.76845	F-statistic	12.83020
Durbin-Watson stat	2.084610	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.672486	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF24,2)
Date: 02/15/98 Time: 10:28
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF24(-1))	-1.316397	0.281734	-4.672486	0.0000
D(FF24(-1),2)	0.336538	0.250616	1.342841	0.1839
D(FF24(-2),2)	0.199284	0.215092	0.926508	0.3575
D(FF24(-3),2)	0.211878	0.168248	1.259321	0.2123
D(FF24(-4),2)	0.218878	0.120076	1.822828	0.0728
C	0.012058	0.020812	0.579399	0.5643
@TREND(1976:1)	-0.000238	0.000438	-0.542272	0.5894

R-squared	0.528067	Mean dependent var	0.000858
Adjusted R-squared	0.485804	S.D. dependent var	0.111408
S.E. of regression	0.079888	Akaike info criterion	-4.964449
Sum squared resid	0.427597	Schwarz criterion	-4.746497
Log likelihood	85.68317	F-statistic	12.49488
Durbin-Watson stat	1.893291	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.311861	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF25,2)
Date: 02/15/98 Time: 10:29
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF25(-1))	-1.068085	0.247708	-4.311861	0.0001
D(FF25(-1),2)	0.208274	0.227114	0.917049	0.3624
D(FF25(-2),2)	0.127218	0.194430	0.654314	0.5151
D(FF25(-3),2)	0.088718	0.159208	0.557245	0.5792
D(FF25(-4),2)	0.245160	0.119475	2.051976	0.0441
C	0.004724	0.019365	0.243952	0.8080
@TREND(1976:1)	1.43E-06	0.000407	0.003517	0.9972

R-squared	0.496763	Mean dependent var	0.000691
Adjusted R-squared	0.451697	S.D. dependent var	0.100828
S.E. of regression	0.074661	Akaike info criterion	-5.099782
Sum squared resid	0.373474	Schwarz criterion	-4.881830
Log likelihood	90.69050	F-statistic	11.02303
Durbin-Watson stat	1.966944	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.225695	1%	Critical Value*	-4.0853
		5%	Critical Value	-3.4704
		10%	Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF26,2)
Date: 02/15/98 Time: 10:29
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF26(-1))	-1.361451	0.322184	-4.225695	0.0001
D(FF26(-1),2)	0.238114	0.284172	0.837922	0.4051
D(FF26(-2),2)	0.090184	0.238820	0.377624	0.7069
D(FF26(-3),2)	0.056089	0.183050	0.306414	0.7602
D(FF26(-4),2)	0.045457	0.121764	0.373320	0.7101
C	0.046664	0.023793	1.961275	0.0540
@TREND(1976:1)	0.000382	0.000481	0.793475	0.4303

R-squared	0.564347	Mean dependent var	0.001329
Adjusted R-squared	0.525333	S.D. dependent var	0.123425
S.E. of regression	0.085035	Akaike info criterion	-4.839567
Sum squared resid	0.484474	Schwarz criterion	-4.621615
Log likelihood	81.06252	F-statistic	14.46535
Durbin-Watson stat	2.013891	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.584954	1%	Critical Value*	-4.0990
		5%	Critical Value	-3.4769
		10%	Critical Value	-3.1657

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF27)
Date: 02/15/98 Time: 10:31
Sample(adjusted): 1979:2 1995:4
Included observations: 67 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FF27(-1)	-0.511667	0.142726	-3.584954	0.0007
D(FF27(-1))	0.078944	0.156327	0.504993	0.6154
D(FF27(-2))	-0.003083	0.137555	-0.022413	0.9822
D(FF27(-3))	-0.055542	0.121516	-0.457073	0.6493
D(FF27(-4))	0.572479	0.110476	5.181949	0.0000
C	-0.505649	0.211850	-2.386826	0.0202
@TREND(1976:1)	-0.005290	0.003584	-1.476044	0.1452

R-squared	0.626924	Mean dependent var	-0.017742
Adjusted R-squared	0.589617	S.D. dependent var	0.798272
S.E. of regression	0.511383	Akaike info criterion	-1.242667
Sum squared resid	15.69074	Schwarz criterion	-1.012326
Log likelihood	-46.43955	F-statistic	16.80420
Durbin-Watson stat	2.198771	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.696932	1%	Critical Value*	-4.2165
		5%	Critical Value	-3.5312
		10%	Critical Value	-3.1968

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF28,2)
Date: 02/15/98 Time: 10:32
Sample(adjusted): 1986:3 1995:4
Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(FF28(-1))	-1.291634	0.349380	-3.696932	0.0008
D(FF28(-1),2)	0.477698	0.297474	1.605847	0.1184
D(FF28(-2),2)	0.324757	0.261051	1.244037	0.2228
D(FF28(-3),2)	0.300007	0.195880	1.531587	0.1358
D(FF28(-4),2)	0.155345	0.148844	1.043672	0.3047
C	0.019667	0.060081	0.327342	0.7456
@TREND(1976:1)	-0.002267	0.001150	-1.970954	0.0577

R-squared	0.454528	Mean dependent var	-0.003789
Adjusted R-squared	0.348953	S.D. dependent var	0.080308
S.E. of regression	0.064799	Akaike info criterion	-5.308111
Sum squared resid	0.130166	Schwarz criterion	-5.006451
Log likelihood	53.93445	F-statistic	4.305252
Durbin-Watson stat	2.064208	Prob(F-statistic)	0.002866

ADF Test Statistic	-3.938669	1%	Critical Value*	-4.0853
		5%	Critical Value	-3.4704
		10%	Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF29,2)
Date: 02/15/98 Time: 10:32
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF29(-1))	-1.181512	0.299978	-3.938669	0.0002
D(FF29(-1),2)	0.074466	0.273207	0.272563	0.7860
D(FF29(-2),2)	-0.008666	0.235604	-0.036781	0.9708
D(FF29(-3),2)	0.034983	0.186283	0.187796	0.8516
D(FF29(-4),2)	0.145426	0.125395	1.159747	0.2503
C	0.003407	0.021299	0.159980	0.8734
@TREND(1976:1)	0.000863	0.000503	1.717124	0.0906

R-squared	0.576983	Mean dependent var	0.001095
Adjusted R-squared	0.539101	S.D. dependent var	0.121155
S.E. of regression	0.082251	Akaike info criterion	-4.906135
Sum squared resid	0.453274	Schwarz criterion	-4.688183
Log likelihood	83.52554	F-statistic	15.23101
Durbin-Watson stat	1.991558	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.726287	1%	Critical Value*	-4.0853
		5%	Critical Value	-3.4704
		10%	Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF30,2)
Date: 02/15/98 Time: 10:33
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF30(-1))	-1.217940	0.257695	-4.726287	0.0000
D(FF30(-1),2)	0.240692	0.235947	1.020113	0.3113
D(FF30(-2),2)	0.187415	0.206300	0.908458	0.3669
D(FF30(-3),2)	0.236391	0.166511	1.419670	0.1603
D(FF30(-4),2)	0.358207	0.121526	2.947562	0.0044
C	0.036687	0.025411	1.443761	0.1535
@TREND(1976:1)	0.000745	0.000541	1.377401	0.1730

R-squared	0.571944	Mean dependent var	0.000861
Adjusted R-squared	0.533611	S.D. dependent var	0.138314
S.E. of regression	0.094458	Akaike info criterion	-4.629380
Sum squared resid	0.597797	Schwarz criterion	-4.411428
Log likelihood	73.28561	F-statistic	14.92029
Durbin-Watson stat	1.934369	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.563920	1%	Critical Value*	-4.0836

	5%	Critical Value	-3.4696
	10%	Critical Value	-3.1615

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF31)
Date: 02/15/98 Time: 10:34
Sample(adjusted): 1977:2 1995:4
Included observations: 75 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FF31(-1)	-0.259009	0.072675	-3.563920	0.0007
D(FF31(-1))	-0.003136	0.114185	-0.027466	0.9782
D(FF31(-2))	0.269670	0.112046	2.406777	0.0188
D(FF31(-3))	-0.018225	0.116276	-0.156741	0.8759
D(FF31(-4))	0.355488	0.121909	2.915998	0.0048
C	0.119493	0.043869	2.723841	0.0082
@TREND(1976:1)	-0.008407	0.002359	-3.563153	0.0007

R-squared	0.384350	Mean dependent var	-0.030140
Adjusted R-squared	0.330028	S.D. dependent var	0.092835
S.E. of regression	0.075987	Akaike info criterion	-5.065695
Sum squared resid	0.392635	Schwarz criterion	-4.849396
Log likelihood	90.54318	F-statistic	7.075395
Durbin-Watson stat	1.909796	Prob(F-statistic)	0.000007

ADF Test Statistic	-4.533051	1%	Critical Value*	-4.0853
		5%	Critical Value	-3.4704
		10%	Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF32,2)
Date: 02/15/98 Time: 10:34
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF32(-1))	-1.062681	0.234430	-4.533051	0.0000
D(FF32(-1),2)	0.166977	0.215097	0.776290	0.4403
D(FF32(-2),2)	0.170369	0.192395	0.885519	0.3790
D(FF32(-3),2)	0.259620	0.161595	1.606607	0.1128
D(FF32(-4),2)	0.310862	0.121696	2.554416	0.0129
C	0.013604	0.022877	0.594666	0.5541
@TREND(1976:1)	0.000923	0.000531	1.737967	0.0868

R-squared	0.503815	Mean dependent var	0.000936
Adjusted R-squared	0.459381	S.D. dependent var	0.119804
S.E. of regression	0.088088	Akaike info criterion	-4.769023
Sum squared resid	0.519885	Schwarz criterion	-4.551071
Log likelihood	78.45241	F-statistic	11.33839
Durbin-Watson stat	2.033399	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.780278	1%	Critical Value*	-4.0853
		5%	Critical Value	-3.4704
		10%	Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF33,2)
Date: 02/15/98 Time: 10:35
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF33(-1))	-1.031854	0.215856	-4.780278	0.0000

D(FF33(-1),2)	0.276064	0.200130	1.379425	0.1724
D(FF33(-2),2)	0.137135	0.182973	0.749486	0.4562
D(FF33(-3),2)	0.297071	0.149977	1.980770	0.0517
D(FF33(-4),2)	0.374534	0.120222	3.115360	0.0027
C	0.000262	0.051548	0.005086	0.9960
@TREND(1976:1)	0.002736	0.001222	2.239374	0.0285

R-squared	0.523042	Mean dependent var	0.002492
Adjusted R-squared	0.480330	S.D. dependent var	0.276004
S.E. of regression	0.198966	Akaike info criterion	-3.139425
Sum squared resid	2.652362	Schwarz criterion	-2.921473
Log likelihood	18.15729	F-statistic	12.24561
Durbin-Watson stat	2.035943	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.697657	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF34,2)
Date: 02/15/98 Time: 10:36
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF34(-1))	-1.328201	0.282737	-4.697657	0.0000
D(FF34(-1),2)	0.416859	0.245823	1.695773	0.0946
D(FF34(-2),2)	0.115258	0.214936	0.536242	0.5936
D(FF34(-3),2)	0.267365	0.156746	1.705714	0.0927
D(FF34(-4),2)	0.143188	0.118469	1.208652	0.2310
C	-0.003175	0.005320	-0.596852	0.5526
@TREND(1976:1)	4.25E-05	0.000111	0.382830	0.7031

R-squared	0.565601	Mean dependent var	-4.19E-05
Adjusted R-squared	0.526700	S.D. dependent var	0.029414
S.E. of regression	0.020236	Akaike info criterion	-7.710779
Sum squared resid	0.027436	Schwarz criterion	-7.492827
Log likelihood	187.2974	F-statistic	14.53938
Durbin-Watson stat	1.974652	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.594062	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF35,2)
Date: 02/15/98 Time: 10:36
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF35(-1))	-0.905180	0.251854	-3.594062	0.0006
D(FF35(-1),2)	0.075620	0.230009	0.328770	0.7434
D(FF35(-2),2)	-0.206268	0.207706	-0.993079	0.3242
D(FF35(-3),2)	0.092097	0.159055	0.579029	0.5645
D(FF35(-4),2)	0.059688	0.122991	0.485303	0.6290
C	0.001206	0.004467	0.270017	0.7880
@TREND(1976:1)	-1.78E-05	9.38E-05	-0.189454	0.8503

R-squared	0.555773	Mean dependent var	-9.30E-05
Adjusted R-squared	0.515991	S.D. dependent var	0.024747
S.E. of regression	0.017217	Akaike info criterion	-8.033904
Sum squared resid	0.019860	Schwarz criterion	-7.815952
Log likelihood	199.2530	F-statistic	13.97063
Durbin-Watson stat	2.003510	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.602737	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF36,2)
Date: 02/15/98 Time: 10:37
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF36(-1))	-0.869131	0.241242	-3.602737	0.0006
D(FF36(-1),2)	0.083094	0.220899	0.376163	0.7080
D(FF36(-2),2)	-0.196241	0.200334	-0.979569	0.3308
D(FF36(-3),2)	0.105521	0.154156	0.684507	0.4960
D(FF36(-4),2)	0.066552	0.121906	0.545932	0.5869
C	0.001102	0.006527	0.168841	0.8664
@TREND(1976:1)	-2.81E-05	0.000137	-0.205047	0.8382

R-squared	0.537126	Mean dependent var	-0.000103
Adjusted R-squared	0.495675	S.D. dependent var	0.035468
S.E. of regression	0.025188	Akaike info criterion	-7.272980
Sum squared resid	0.042506	Schwarz criterion	-7.055028
Log likelihood	171.0988	F-statistic	12.95799
Durbin-Watson stat	2.001046	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.758196	1% Critical Value*	-4.0871
		5% Critical Value	-3.4713
		10% Critical Value	-3.1624

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF37,3)
Date: 02/15/98 Time: 10:38
Sample(adjusted): 1977:4 1995:4
Included observations: 73 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF37(-1),2)	-3.486203	0.605433	-5.758196	0.0000
D(FF37(-1),3)	1.619117	0.529027	3.060555	0.0032
D(FF37(-2),3)	0.784753	0.408410	1.921484	0.0590
D(FF37(-3),3)	0.317094	0.256449	1.236482	0.2207
D(FF37(-4),3)	0.041520	0.123262	0.336845	0.7373
C	0.000253	0.003082	0.082132	0.9348
@TREND(1976:1)	-4.76E-06	6.43E-05	-0.074012	0.9412

R-squared	0.817323	Mean dependent var	-1.57E-05
Adjusted R-squared	0.800716	S.D. dependent var	0.025937
S.E. of regression	0.011578	Akaike info criterion	-8.826253
Sum squared resid	0.008848	Schwarz criterion	-8.606620
Log likelihood	225.5757	F-statistic	49.21553
Durbin-Watson stat	2.003075	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.054139	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF38,2)
Date: 02/15/98 Time: 10:45
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF38(-1))	-0.967429	0.238627	-4.054139	0.0001
D(FF38(-1),2)	0.198068	0.216816	0.913530	0.3642
D(FF38(-2),2)	-0.073432	0.195974	-0.374702	0.7091

D(FF38(-3),2)	0.189693	0.149749	1.266739	0.2096
D(FF38(-4),2)	0.156828	0.119953	1.307417	0.1955
C	0.001015	0.010712	0.094763	0.9248
@TREND(1976:1)	-3.85E-05	0.000225	-0.170827	0.8649

R-squared	0.539096	Mean dependent var	-0.000223
Adjusted R-squared	0.497821	S.D. dependent var	0.058341
S.E. of regression	0.041343	Akaike info criterion	-6.281898
Sum squared resid	0.114518	Schwarz criterion	-6.063946
Log likelihood	134.4288	F-statistic	13.06107
Durbin-Watson stat	1.975724	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.544124	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF39,2)
Date: 02/15/98 Time: 10:46
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF39(-1))	-0.766387	0.216242	-3.544124	0.0007
D(FF39(-1),2)	0.127813	0.199421	0.640920	0.5238
D(FF39(-2),2)	-0.246400	0.185695	-1.326907	0.1890
D(FF39(-3),2)	0.179146	0.141414	1.266817	0.2096
D(FF39(-4),2)	0.028015	0.121012	0.231502	0.8176
C	-0.000686	0.004928	-0.139210	0.8897
@TREND(1976:1)	4.17E-07	0.000103	0.004038	0.9968

R-squared	0.552459	Mean dependent var	6.38E-05
Adjusted R-squared	0.512381	S.D. dependent var	0.027136
S.E. of regression	0.018949	Akaike info criterion	-7.842169
Sum squared resid	0.024058	Schwarz criterion	-7.624217
Log likelihood	192.1588	F-statistic	13.78448
Durbin-Watson stat	1.988678	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.822932	1% Critical Value*	-4.0871
		5% Critical Value	-3.4713
		10% Critical Value	-3.1624

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF40,3)
Date: 02/15/98 Time: 10:47
Sample(adjusted): 1977:4 1995:4
Included observations: 73 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF40(-1),2)	-2.832990	0.486523	-5.822932	0.0000
D(FF40(-1),3)	1.222254	0.425001	2.875887	0.0054
D(FF40(-2),3)	0.571162	0.336906	1.695313	0.0947
D(FF40(-3),3)	0.362102	0.215100	1.683412	0.0970
D(FF40(-4),3)	0.175847	0.115050	1.528438	0.1312
C	0.002556	0.003033	0.842708	0.4024
@TREND(1976:1)	-4.49E-05	6.32E-05	-0.709722	0.4804

R-squared	0.797725	Mean dependent var	0.000311
Adjusted R-squared	0.779336	S.D. dependent var	0.024161
S.E. of regression	0.011350	Akaike info criterion	-8.866138
Sum squared resid	0.008502	Schwarz criterion	-8.646505
Log likelihood	227.0315	F-statistic	43.38129
Durbin-Watson stat	1.819489	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.711829	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF41,2)
Date: 02/15/98 Time: 10:48
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF41(-1))	-1.032759	0.219184	-4.711829	0.0000
D(FF41(-1),2)	0.341774	0.195381	1.749272	0.0848
D(FF41(-2),2)	0.143533	0.176812	0.811782	0.4198
D(FF41(-3),2)	0.265091	0.140174	1.891157	0.0629
D(FF41(-4),2)	0.223589	0.117622	1.900903	0.0616
C	-0.001798	0.005179	-0.347291	0.7295
@TREND(1976:1)	4.79E-05	0.000109	0.439643	0.6616

R-squared	0.442306	Mean dependent var	0.000119
Adjusted R-squared	0.392363	S.D. dependent var	0.025571
S.E. of regression	0.019933	Akaike info criterion	-7.740971
Sum squared resid	0.026620	Schwarz criterion	-7.523019
Log likelihood	188.4145	F-statistic	8.856259
Durbin-Watson stat	1.857630	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.194120	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF42,2)
Date: 02/15/98 Time: 10:49
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF42(-1))	-0.982297	0.234208	-4.194120	0.0001
D(FF42(-1),2)	0.069706	0.216873	0.321415	0.7489
D(FF42(-2),2)	0.063298	0.193654	0.326861	0.7448
D(FF42(-3),2)	0.177709	0.157371	1.129237	0.2628
D(FF42(-4),2)	0.268851	0.115349	2.330771	0.0228
C	0.001026	0.005895	0.173998	0.8624
@TREND(1976:1)	1.29E-05	0.000124	0.104507	0.9171

R-squared	0.515763	Mean dependent var	0.000104
Adjusted R-squared	0.472399	S.D. dependent var	0.031307
S.E. of regression	0.022740	Akaike info criterion	-7.477440
Sum squared resid	0.034646	Schwarz criterion	-7.259487
Log likelihood	178.6638	F-statistic	11.89367
Durbin-Watson stat	1.847464	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.000431	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(FF43,2)
Date: 02/15/98 Time: 10:49
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FF43(-1))	-0.907474	0.226844	-4.000431	0.0002
D(FF43(-1),2)	0.213835	0.203726	1.049616	0.2977
D(FF43(-2),2)	-0.079789	0.187543	-0.425444	0.6719
D(FF43(-3),2)	0.230614	0.143978	1.601727	0.1139

D(FF43(-4),2)	0.084182	0.120887	0.696374	0.4886
C	0.003354	0.011583	0.289570	0.7730
@TREND(1976:1)	-8.99E-05	0.000244	-0.368988	0.7133

R-squared	0.507732	Mean dependent var	-0.000179
Adjusted R-squared	0.463648	S.D. dependent var	0.060967
S.E. of regression	0.044650	Akaike info criterion	-6.128002
Sum squared resid	0.133570	Schwarz criterion	-5.910050
Log likelihood	128.7346	F-statistic	11.51745
Durbin-Watson stat	1.980243	Prob(F-statistic)	0.000000

2.2.5 SURFACE TRANSPORTATION COSTS: (S)

LS // Dependent Variable is D(D(S1))
Date: 10-08-1997 / Time: 17:37
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S1)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S1(-1)))	0.2069135	0.2812863	0.7355976	0.4645
D(D(S1(-2)))	-0.2607780	0.2419159	-1.0779699	0.2849
D(D(S1(-3)))	-0.0192615	0.1705237	-0.1129550	0.9104
D(D(S1(-4)))	-0.0707050	0.1222521	-0.5783544	0.5650
D(S1(-1))	-1.1715836	0.3186253	-3.6769950	0.0005
C	-0.0074735	0.0317231	-0.2355841	0.8145
TREND	0.0003256	0.0006596	0.4936524	0.6232

R-squared	0.639750	Mean of dependent var	0.000780
Adjusted R-squared	0.607489	S.D. of dependent var	0.191087
S.E. of regression	0.119717	Sum of squared resid	0.960263
Log likelihood	55.74925	F-statistic	19.83032
Durbin-Watson stat	1.977837	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S2))
Date: 10-08-1997 / Time: 17:38
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S2(-1)))	0.0613909	0.3359593	0.1827331	0.8556
D(D(S2(-2)))	-0.1928170	0.2805596	-0.6872587	0.4943
D(D(S2(-3)))	-0.0947178	0.2029750	-0.4666477	0.6423
D(D(S2(-4)))	-0.1233245	0.1205320	-1.0231677	0.3099
D(S2(-1))	-1.4103362	0.3812214	-3.6995198	0.0004
C	-0.0112606	0.0233529	-0.4821919	0.6312
TREND	0.0002022	0.0004800	0.4213003	0.6749

R-squared	0.688247	Mean of dependent var	0.000217
Adjusted R-squared	0.660329	S.D. of dependent var	0.150006
S.E. of regression	0.087425	Sum of squared resid	0.512095
Log likelihood	79.01102	F-statistic	24.65227
Durbin-Watson stat	1.951349	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S3))
Date: 10-08-1997 / Time: 17:38
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S3)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S3(-1)))	0.1252779	0.2520881	0.4969607	0.6208
D(D(S3(-2)))	-0.0607120	0.2106974	-0.2881479	0.7741
D(D(S3(-3)))	0.0270055	0.1593708	0.1694508	0.8660
D(D(S3(-4)))	0.1474873	0.1081600	1.3636026	0.1773
D(S3(-1))	-1.1057763	0.2767984	-3.9948792	0.0002
C	0.0124408	0.0220644	0.5638415	0.5747
TREND	-0.0002932	0.0004552	-0.6440901	0.5217

R-squared	0.568500	Mean of dependent var	0.000690
Adjusted R-squared	0.529858	S.D. of dependent var	0.118686
S.E. of regression	0.081379	Sum of squared resid	0.443713
Log likelihood	84.31432	F-statistic	14.71206
Durbin-Watson stat	1.900808	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S4,2))
Date: 10-08-1997 / Time: 17:39
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(S4,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.

```
        D(D(S4(-1),2))    1.7319029      0.4732207      3.6598210      0.0005
        D(D(S4(-2),2))    0.8894033      0.3657924      2.4314429      0.0178
        D(D(S4(-3),2))    0.3907300      0.2306513      1.6940294      0.0950
        D(D(S4(-4),2))    0.1813247      0.1221731      1.4841626      0.1425
         D(S4(-1),2)     -3.3608423      0.5418983     -6.2019803      0.0000
              C          -0.0173187      0.0361336     -0.4792950      0.6333
            TREND         0.0003383      0.0007413      0.4563120      0.6497

     R-squared                  0.787144    Mean of dependent var      0.001162
     Adjusted R-squared         0.767794    S.D. of dependent var      0.274879
     S.E. of regression         0.132458    Sum of squared resid       1.157983
     Log likelihood             47.66544    F-statistic                40.67815
     Durbin-Watson stat         2.009609    Prob(F-statistic)          0.000000

LS // Dependent Variable is D(D(S5))
     Date: 10-08-1997 / Time: 17:39
     SMPL range: 1977.3 - 1995.4
     Number of observations: 74
     Augmented Dickey-Fuller: UROOT(T,4) D(S5)
           VARIABLE      COEFFICIENT   STD. ERROR       T-STAT.   2-TAIL SIG.
         D(D(S5(-1)))     0.5337330      0.3144445      1.6973837      0.0943
         D(D(S5(-2)))     0.2876131      0.2525798      1.1387015      0.2589
         D(D(S5(-3)))     0.0724529      0.1870661      0.3873116      0.6998
         D(D(S5(-4)))     0.2803414      0.1160717      2.4152439      0.0185
          D(S5(-1))      -1.7540215      0.3487309     -5.0297279      0.0000
              C          -0.0795014      0.0414900     -1.9161603      0.0596
            TREND        -0.0024219      0.0009844     -2.4603683      0.0165

     R-squared                  0.726061    Mean of dependent var     -0.004361
     Adjusted R-squared         0.701530    S.D. of dependent var      0.276182
     S.E. of regression         0.150885    Sum of squared resid       1.525336
     Log likelihood             38.62700    F-statistic                29.59673
     Durbin-Watson stat         2.008246    Prob(F-statistic)          0.000000

LS // Dependent Variable is D(D(S6,2))
     Date: 10-08-1997 / Time: 17:40
     SMPL range: 1977.4 - 1995.4
     Number of observations: 73
     Augmented Dickey-Fuller: UROOT(T,4) D(S6,2)
           VARIABLE      COEFFICIENT   STD. ERROR       T-STAT.   2-TAIL SIG.
        D(D(S6(-1),2))    1.5732308      0.5926306      2.6546568      0.0099
        D(D(S6(-2),2))    0.6345734      0.4491563      1.4128119      0.1624
        D(D(S6(-3),2))    0.0700171      0.2757903      0.2538779      0.8004
        D(D(S6(-4),2))   -0.0208706      0.1239293     -0.1684073      0.8668
         D(S6(-1),2)     -3.5696891      0.6690832     -5.3351947      0.0000
              C          -0.0096232      0.0247346     -0.3890583      0.6985
            TREND         0.0002220      0.0005079      0.4371608      0.6634

     R-squared                  0.849026    Mean of dependent var     -0.000175
     Adjusted R-squared         0.835301    S.D. of dependent var      0.223620
     S.E. of regression         0.090752    Sum of squared resid       0.543571
     Log likelihood             75.26947    F-statistic                61.86001
     Durbin-Watson stat         1.972565    Prob(F-statistic)          0.000000

LS // Dependent Variable is D(D(S7))
     Date: 10-08-1997 / Time: 17:40
     SMPL range: 1977.3 - 1995.4
     Number of observations: 74
     Augmented Dickey-Fuller: UROOT(T,4) D(S7)
           VARIABLE      COEFFICIENT   STD. ERROR       T-STAT.   2-TAIL SIG.
         D(D(S7(-1)))     0.2069135      0.2812863      0.7355975      0.4645
         D(D(S7(-2)))    -0.2607779      0.2419159     -1.0779692      0.2849
         D(D(S7(-3)))    -0.0192615      0.1705237     -0.1129548      0.9104
         D(D(S7(-4)))    -0.0707049      0.1222521     -0.5783537      0.5650
          D(S7(-1))      -1.1715836      0.3186253     -3.6769951      0.0005
              C          -0.0074735      0.0317231     -0.2355840      0.8145
            TREND         0.0003256      0.0006596      0.4936522      0.6232

     R-squared                  0.639750    Mean of dependent var      0.000780
     Adjusted R-squared         0.607489    S.D. of dependent var      0.191087
     S.E. of regression         0.119718    Sum of squared resid       0.960263
     Log likelihood             55.74925    F-statistic                19.83032
     Durbin-Watson stat         1.977837    Prob(F-statistic)          0.000000

LS // Dependent Variable is D(D(S8))
     Date: 10-08-1997 / Time: 17:41
     SMPL range: 1977.3 - 1995.4
     Number of observations: 74
     Augmented Dickey-Fuller: UROOT(T,4) D(S8)
           VARIABLE      COEFFICIENT   STD. ERROR       T-STAT.   2-TAIL SIG.
         D(D(S8(-1)))     0.1830296      0.2810569      0.6512192      0.5171
```

D(D(S8(-2)))	-0.2852324	0.2402548	-1.1872079	0.2393
D(D(S8(-3)))	-0.0734448	0.1697190	-0.4327434	0.6666
D(D(S8(-4)))	-0.0483774	0.1226966	-0.3942848	0.6946
D(S8(-1))	-1.1395162	0.3157638	-3.6087608	0.0006
C	-0.0013057	0.0197768	-0.0660194	0.9476
TREND	8.585E-05	0.0004084	0.2102062	0.8341

R-squared	0.639574	Mean of dependent var	0.000117
Adjusted R-squared	0.607297	S.D. of dependent var	0.119593
S.E. of regression	0.074944	Sum of squared resid	0.376316
Log likelihood	90.40997	F-statistic	19.81515
Durbin-Watson stat	1.984895	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S9))
Date: 10-08-1997 / Time: 17:41
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S9)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S9(-1)))	-0.0473448	0.3085367	-0.1534495	0.8785
D(D(S9(-2)))	-0.1615556	0.2539245	-0.6362347	0.5268
D(D(S9(-3)))	-0.1818777	0.1916483	-0.9490182	0.3460
D(D(S9(-4)))	-0.0380790	0.1179890	-0.3227333	0.7479
D(S9(-1))	-1.2163610	0.3438392	-3.5375867	0.0007
C	0.0048996	0.0275553	0.1778081	0.8594
TREND	-9.591E-05	0.0005687	-0.1686491	0.8666

R-squared	0.630606	Mean of dependent var	0.000863
Adjusted R-squared	0.597526	S.D. of dependent var	0.163204
S.E. of regression	0.103538	Sum of squared resid	0.718250
Log likelihood	66.49365	F-statistic	19.06306
Durbin-Watson stat	2.002040	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S10))
Date: 10-08-1997 / Time: 17:41
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S10)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S10(-1)))	0.1252778	0.2520880	0.4969604	0.6208
D(D(S10(-2)))	-0.0607122	0.2106973	-0.2881490	0.7741
D(D(S10(-3)))	0.0270055	0.1593708	0.1694505	0.8660
D(D(S10(-4)))	0.1474871	0.1081600	1.3636010	0.1773
D(S10(-1))	-1.1057760	0.2767984	-3.9948783	0.0002
C	0.0124408	0.0220644	0.5638417	0.5747
TREND	-0.0002932	0.0004552	-0.6440902	0.5217

R-squared	0.568500	Mean of dependent var	0.000690
Adjusted R-squared	0.529858	S.D. of dependent var	0.118686
S.E. of regression	0.081379	Sum of squared resid	0.443713
Log likelihood	84.31433	F-statistic	14.71205
Durbin-Watson stat	1.900809	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S11))
Date: 10-08-1997 / Time: 17:42
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S11)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S11(-1)))	0.5337328	0.3144445	1.6973832	0.0943
D(D(S11(-2)))	0.2876130	0.2525798	1.1387015	0.2589
D(D(S11(-3)))	0.0724529	0.1870661	0.3873115	0.6998
D(D(S11(-4)))	0.2803416	0.1160717	2.4152454	0.0185
D(S11(-1))	-1.7540211	0.3487308	-5.0297276	0.0000
C	-0.0795014	0.0414900	-1.9161597	0.0596
TREND	-0.0024219	0.0009844	-2.4603684	0.0165

R-squared	0.726062	Mean of dependent var	-0.004361
Adjusted R-squared	0.701530	S.D. of dependent var	0.276182
S.E. of regression	0.150885	Sum of squared resid	1.525336
Log likelihood	38.62701	F-statistic	29.59675
Durbin-Watson stat	2.008246	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S12))
Date: 10-08-1997 / Time: 17:42
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S12)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S12(-1)))	0.1784811	0.2351271	0.7590835	0.4505
D(D(S12(-2)))	0.0231632	0.1983537	0.1167772	0.9074

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S12(-3)))	0.0120420	0.1548021	0.0777897	0.9382
D(D(S12(-4)))	0.1742837	0.1085353	1.6057782	0.1130
D(S12(-1))	-1.0803130	0.2620278	-4.1228938	0.0001
C	0.0105917	0.0216010	0.4903337	0.6255
TREND	-0.0001709	0.0004425	-0.3862137	0.7006

R-squared	0.529371	Mean of dependent var	0.001210
Adjusted R-squared	0.487225	S.D. of dependent var	0.111600
S.E. of regression	0.079915	Sum of squared resid	0.427888
Log likelihood	85.65799	F-statistic	12.56044
Durbin-Watson stat	1.919835	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S13))
Date: 10-08-1997 / Time: 17:43
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S13)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S13(-1)))	0.1830296	0.2810569	0.6512191	0.5171
D(D(S13(-2)))	-0.2852325	0.2402548	-1.1872086	0.2393
D(D(S13(-3)))	-0.0734448	0.1697190	-0.4327433	0.6666
D(D(S13(-4)))	-0.0483776	0.1226966	-0.3942860	0.6946
D(S13(-1))	-1.1395160	0.3157638	-3.6087606	0.0006
C	-0.0013057	0.0197768	-0.0660194	0.9476
TREND	8.585E-05	0.0004084	0.2102062	0.8341

R-squared	0.639574	Mean of dependent var	0.000117
Adjusted R-squared	0.607297	S.D. of dependent var	0.119593
S.E. of regression	0.074944	Sum of squared resid	0.376316
Log likelihood	90.40998	F-statistic	19.81515
Durbin-Watson stat	1.984895	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S14))
Date: 10-08-1997 / Time: 17:43
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S14)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S14(-1)))	0.1830295	0.2810569	0.6512187	0.5171
D(D(S14(-2)))	-0.2852326	0.2402548	-1.1872086	0.2393
D(D(S14(-3)))	-0.0734449	0.1697190	-0.4327443	0.6666
D(D(S14(-4)))	-0.0483775	0.1226966	-0.3942857	0.6946
D(S14(-1))	-1.1395160	0.3157638	-3.6087602	0.0006
C	-0.0013056	0.0197768	-0.0660193	0.9476
TREND	8.585E-05	0.0004084	0.2102060	0.8341

R-squared	0.639574	Mean of dependent var	0.000117
Adjusted R-squared	0.607297	S.D. of dependent var	0.119593
S.E. of regression	0.074944	Sum of squared resid	0.376316
Log likelihood	90.40998	F-statistic	19.81515
Durbin-Watson stat	1.984894	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S15))
Date: 10-08-1997 / Time: 17:43
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S15)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S15(-1)))	0.1830297	0.2810568	0.6512195	0.5171
D(D(S15(-2)))	-0.2852330	0.2402547	-1.1872105	0.2393
D(D(S15(-3)))	-0.0734447	0.1697190	-0.4327432	0.6666
D(D(S15(-4)))	-0.0483779	0.1226966	-0.3942885	0.6946
D(S15(-1))	-1.1395157	0.3157638	-3.6087599	0.0006
C	-0.0013057	0.0197768	-0.0660196	0.9476
TREND	8.585E-05	0.0004084	0.2102063	0.8341

R-squared	0.639574	Mean of dependent var	0.000117
Adjusted R-squared	0.607297	S.D. of dependent var	0.119593
S.E. of regression	0.074944	Sum of squared resid	0.376316
Log likelihood	90.40999	F-statistic	19.81517
Durbin-Watson stat	1.984894	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S16,2))
Date: 10-08-1997 / Time: 17:44
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(S16,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S16(-1),2))	1.5732307	0.5926306	2.6546565	0.0099
D(D(S16(-2),2))	0.6345733	0.4491563	1.4128117	0.1624
D(D(S16(-3),2))	0.0700170	0.2757903	0.2538777	0.8004

D(D(S16(-4),2))	-0.0208707	0.1239293	-0.1684077	0.8668
D(S16(-1),2)	-3.5696890	0.6690832	-5.3351944	0.0000
C	-0.0096232	0.0247346	-0.3890589	0.6985
TREND	0.0002220	0.0005079	0.4371613	0.6634

R-squared	0.849026	Mean of dependent var	-0.000175
Adjusted R-squared	0.835301	S.D. of dependent var	0.223620
S.E. of regression	0.090752	Sum of squared resid	0.543571
Log likelihood	75.26946	F-statistic	61.86001
Durbin-Watson stat	1.972565	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S17,2))
Date: 10-08-1997 / Time: 17:45
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(S17,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S17(-1),2))	1.5732304	0.5926305	2.6546564	0.0099
D(D(S17(-2),2))	0.6345733	0.4491563	1.4128117	0.1624
D(D(S17(-3),2))	0.0700170	0.2757903	0.2538776	0.8004
D(D(S17(-4),2))	-0.0208706	0.1239293	-0.1684069	0.8668
D(S17(-1),2)	-3.5696887	0.6690831	-5.3351946	0.0000
C	-0.0096232	0.0247346	-0.3890587	0.6985
TREND	0.0002220	0.0005079	0.4371612	0.6634

R-squared	0.849026	Mean of dependent var	-0.000175
Adjusted R-squared	0.835301	S.D. of dependent var	0.223620
S.E. of regression	0.090752	Sum of squared resid	0.543571
Log likelihood	75.26947	F-statistic	61.86001
Durbin-Watson stat	1.972565	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S18))
Date: 10-08-1997 / Time: 17:45
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S18)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S18(-1)))	0.0331491	0.3311122	0.1001143	0.9206
D(D(S18(-2)))	-0.2192578	0.2776910	-0.7895748	0.4326
D(D(S18(-3)))	-0.1067751	0.2013422	-0.5303165	0.5976
D(D(S18(-4)))	-0.1393910	0.1205592	-1.1562042	0.2517
D(S18(-1))	-1.3630541	0.3758758	-3.6263416	0.0006
C	-0.0140331	0.0232587	-0.6033482	0.5483
TREND	0.0002446	0.0004771	0.5127274	0.6098

R-squared	0.686197	Mean of dependent var	0.000201
Adjusted R-squared	0.658096	S.D. of dependent var	0.148308
S.E. of regression	0.086719	Sum of squared resid	0.503857
Log likelihood	79.61105	F-statistic	24.41833
Durbin-Watson stat	1.944965	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S19))
Date: 10-08-1997 / Time: 17:46
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S19)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S19(-1)))	0.0331495	0.3311121	0.1001155	0.9206
D(D(S19(-2)))	-0.2192575	0.2776910	-0.7895738	0.4326
D(D(S19(-3)))	-0.1067746	0.2013422	-0.5303143	0.5976
D(D(S19(-4)))	-0.1393908	0.1205592	-1.1562023	0.2517
D(S19(-1))	-1.3630544	0.3758758	-3.6263425	0.0006
C	-0.0140331	0.0232587	-0.6033483	0.5483
TREND	0.0002446	0.0004771	0.5127275	0.6098

R-squared	0.686197	Mean of dependent var	0.000201
Adjusted R-squared	0.658096	S.D. of dependent var	0.148308
S.E. of regression	0.086719	Sum of squared resid	0.503858
Log likelihood	79.61104	F-statistic	24.41833
Durbin-Watson stat	1.944965	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S20))
Date: 10-08-1997 / Time: 17:46
SMPL range: 1977.3 - 1995.4
Number of observations: 74
Augmented Dickey-Fuller: UROOT(T,4) D(S20)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S20(-1)))	0.1784811	0.2351271	0.7590835	0.4505
D(D(S20(-2)))	0.0231634	0.1983537	0.1167784	0.9074
D(D(S20(-3)))	0.0120421	0.1548021	0.0777902	0.9382
D(D(S20(-4)))	0.1742838	0.1085353	1.6057797	0.1130

```
      D(S20(-1))    -1.0803131    0.2620279    -4.1228942     0.0001
          C          0.0105917    0.0216010     0.4903339     0.6255
        TREND       -0.0001709    0.0004425    -0.3862140     0.7006

   R-squared                 0.529371   Mean of dependent var     0.001210
   Adjusted R-squared        0.487225   S.D. of dependent var     0.111600
   S.E. of regression        0.079915   Sum of squared resid      0.427888
   Log likelihood            85.65799   F-statistic               12.56044
   Durbin-Watson stat        1.919835   Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(S21))
   Date: 10-08-1997 / Time: 17:47
   SMPL range: 1977.3 - 1995.4
   Number of observations: 74
   Augmented Dickey-Fuller: UROOT(T,4) D(S21)
        VARIABLE     COEFFICIENT   STD. ERROR     T-STAT.    2-TAIL SIG.
     D(D(S21(-1)))   0.1784815    0.2351270     0.7590852     0.4505
     D(D(S21(-2)))   0.0231635    0.1983537     0.1167789     0.9074
     D(D(S21(-3)))   0.0120425    0.1548021     0.0777928     0.9382
     D(D(S21(-4)))   0.1742841    0.1085353     1.6057824     0.1130
      D(S21(-1))    -1.0803133    0.2620278    -4.1228954     0.0001
          C          0.0105917    0.0216010     0.4903343     0.6255
        TREND       -0.0001709    0.0004425    -0.3862141     0.7006

   R-squared                 0.529371   Mean of dependent var     0.001210
   Adjusted R-squared        0.487225   S.D. of dependent var     0.111600
   S.E. of regression        0.079915   Sum of squared resid      0.427888
   Log likelihood            85.65799   F-statistic               12.56045
   Durbin-Watson stat        1.919834   Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(S22))
   Date: 10-08-1997 / Time: 17:48
   SMPL range: 1977.3 - 1995.4
   Number of observations: 74
   Augmented Dickey-Fuller: UROOT(T,4) D(S22)
        VARIABLE     COEFFICIENT   STD. ERROR     T-STAT.    2-TAIL SIG.
     D(D(S22(-1)))  -0.0473447    0.3085367    -0.1534493     0.8785
     D(D(S22(-2)))  -0.1615556    0.2539245    -0.6362349     0.5268
     D(D(S22(-3)))  -0.1818779    0.1916483    -0.9490191     0.3460
     D(D(S22(-4)))  -0.0380791    0.1179890    -0.3227345     0.7479
      D(S22(-1))    -1.2163611    0.3438392    -3.5375866     0.0007
          C          0.0048996    0.0275553     0.1778083     0.8594
        TREND       -9.591E-05    0.0005687    -0.1686494     0.8666

   R-squared                 0.630606   Mean of dependent var     0.000863
   Adjusted R-squared        0.597526   S.D. of dependent var     0.163204
   S.E. of regression        0.103538   Sum of squared resid      0.718250
   Log likelihood            66.49365   F-statistic               19.06306
   Durbin-Watson stat        2.002040   Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(S23))
   Date: 10-08-1997 / Time: 17:48
   SMPL range: 1977.3 - 1995.4
   Number of observations: 74
   Augmented Dickey-Fuller: UROOT(T,4) D(S23)
        VARIABLE     COEFFICIENT   STD. ERROR     T-STAT.    2-TAIL SIG.
     D(D(S23(-1)))   0.2069136    0.2812863     0.7355980     0.4645
     D(D(S23(-2)))  -0.2607777    0.2419159    -1.0779684     0.2849
     D(D(S23(-3)))  -0.0192614    0.1705237    -0.1129545     0.9104
     D(D(S23(-4)))  -0.0707048    0.1222521    -0.5783523     0.5650
      D(S23(-1))    -1.1715838    0.3186253    -3.6769956     0.0005
          C         -0.0074735    0.0317231    -0.2355842     0.8145
        TREND        0.0003256    0.0006596     0.4936524     0.6232

   R-squared                 0.639750   Mean of dependent var     0.000780
   Adjusted R-squared        0.607489   S.D. of dependent var     0.191087
   S.E. of regression        0.119718   Sum of squared resid      0.960263
   Log likelihood            55.74924   F-statistic               19.83032
   Durbin-Watson stat        1.977837   Prob(F-statistic)         0.000000

LS // Dependent Variable is D(D(S24))
   Date: 10-08-1997 / Time: 17:49
   SMPL range: 1977.3 - 1995.4
   Number of observations: 74
   Augmented Dickey-Fuller: UROOT(T,4) D(S24)
        VARIABLE     COEFFICIENT   STD. ERROR     T-STAT.    2-TAIL SIG.
     D(D(S24(-1)))   0.1417269    0.2465641     0.5748076     0.5673
     D(D(S24(-2)))  -0.1973565    0.2170641    -0.9092083     0.3665
     D(D(S24(-3)))   0.0283847    0.1621045     0.1751015     0.8615
     D(D(S24(-4)))   0.0844993    0.1227458     0.6884090     0.4936
      D(S24(-1))    -0.9951019    0.2700749    -3.6845402     0.0005
```

C	0.0119488	0.0204139	0.5853262	0.5603
TREND	-0.0002381	0.0004199	-0.5670524	0.5726

R-squared	0.582040	Mean of dependent var	-0.000499
Adjusted R-squared	0.544611	S.D. of dependent var	0.113095
S.E. of regression	0.076320	Sum of squared resid	0.390254
Log likelihood	89.06441	F-statistic	15.55043
Durbin-Watson stat	1.993766	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S25,2))
Date: 10-08-1997 / Time: 17:49
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(S25,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S25(-1),2))	2.1739917	0.5097344	4.2649501	0.0001
D(D(S25(-2),2))	1.2845724	0.3919876	3.2770742	0.0017
D(D(S25(-3),2))	0.6398466	0.2494606	2.5649205	0.0126
D(D(S25(-4),2))	0.2306626	0.1191063	1.9366122	0.0571
D(S25(-1),2)	-4.0560068	0.5828144	-6.9593455	0.0000
C	-0.0085493	0.0325613	-0.2625599	0.7937
TREND	0.0001829	0.0006677	0.2739810	0.7850

R-squared	0.816267	Mean of dependent var	-0.001901
Adjusted R-squared	0.799564	S.D. of dependent var	0.268160
S.E. of regression	0.120055	Sum of squared resid	0.951279
Log likelihood	54.84237	F-statistic	48.86942
Durbin-Watson stat	1.996563	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S26,2))
Date: 10-08-1997 / Time: 17:50
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(S26,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S26(-1),2))	1.8279276	0.5110104	3.5770849	0.0007
D(D(S26(-2),2))	0.9420845	0.3864902	2.4375380	0.0175
D(D(S26(-3),2))	0.3730906	0.2400395	1.5542883	0.1249
D(D(S26(-4),2))	0.1349011	0.1144334	1.1788608	0.2427
D(S26(-1),2)	-3.6363044	0.5844049	-6.2222350	0.0000
C	-0.0152494	0.0267810	-0.5694117	0.5710
TREND	0.0002601	0.0005482	0.4744820	0.6367

R-squared	0.808954	Mean of dependent var	0.000292
Adjusted R-squared	0.791586	S.D. of dependent var	0.214832
S.E. of regression	0.098076	Sum of squared resid	0.634848
Log likelihood	69.60374	F-statistic	46.57778
Durbin-Watson stat	2.055718	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S27,2))
Date: 10-08-1997 / Time: 17:51
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(S27,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S27(-1),2))	1.7369893	0.4712902	3.6856048	0.0005
D(D(S27(-2),2))	0.8963895	0.3645233	2.4590734	0.0166
D(D(S27(-3),2))	0.4004212	0.2298292	1.7422553	0.0861
D(D(S27(-4),2))	0.1852078	0.1218869	1.5195056	0.1334
D(S27(-1),2)	-3.3634232	0.5399315	-6.2293513	0.0000
C	-0.0168385	0.0364455	-0.4620167	0.6456
TREND	0.0003297	0.0007477	0.4409230	0.6607

R-squared	0.786341	Mean of dependent var	0.001047
Adjusted R-squared	0.766917	S.D. of dependent var	0.276688
S.E. of regression	0.133581	Sum of squared resid	1.177702
Log likelihood	47.04913	F-statistic	40.48382
Durbin-Watson stat	2.011592	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S28,2))
Date: 10-08-1997 / Time: 17:51
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(S28,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S28(-1),2))	2.2371221	0.5650450	3.9591930	0.0002
D(D(S28(-2),2))	1.2727259	0.4309209	2.9535021	0.0043
D(D(S28(-3),2))	0.5312929	0.2727474	1.9479302	0.0557
D(D(S28(-4),2))	0.2089792	0.1252587	1.6683813	0.1000
D(S28(-1),2)	-4.2107968	0.6368788	-6.6116135	0.0000
C	0.0052498	0.0280775	0.1869752	0.8523

TREND	-0.0001223	0.0005759	-0.2122826	0.8325

R-squared	0.844056	Mean of dependent var	-2.31E-06
Adjusted R-squared	0.829880	S.D. of dependent var	0.251012
S.E. of regression	0.103531	Sum of squared resid	0.707437
Log likelihood	65.65216	F-statistic	59.53835
Durbin-Watson stat	1.984450	Prob(F-statistic)	0.000000

LS // Dependent Variable is D(D(S29,2))
Date: 10-08-1997 / Time: 17:52
SMPL range: 1977.4 - 1995.4
Number of observations: 73
Augmented Dickey-Fuller: UROOT(T,4) D(S29,2)

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
D(D(S29(-1),2))	1.9459467	0.5125283	3.7967598	0.0003
D(D(S29(-2),2))	1.0255063	0.3918137	2.6173316	0.0110
D(D(S29(-3),2))	0.4319457	0.2431980	1.7761072	0.0803
D(D(S29(-4),2))	0.1409773	0.1106859	1.2736692	0.2072
D(S29(-1),2)	-3.9341363	0.5830675	-6.7473091	0.0000
C	0.0177469	0.0216134	0.8211067	0.4145
TREND	-0.0002859	0.0004430	-0.6454570	0.5209

R-squared	0.862427	Mean of dependent var	0.004136
Adjusted R-squared	0.849920	S.D. of dependent var	0.205772
S.E. of regression	0.079716	Sum of squared resid	0.419411
Log likelihood	84.73423	F-statistic	68.95740
Durbin-Watson stat	2.028529	Prob(F-statistic)	0.000000

2.3 SEASONNALY ADJUSTED DEPENDENT VARIABLES STATIONARITY TEST (ADF TEST with four lags)

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(Z1,2)
Date: 03/21/98 Time: 14:10
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Z1(-1))	-3.556279	0.665268	-5.345631	0.0000
D(Z1(-1),2)	1.633851	0.586654	2.785036	0.0070
D(Z1(-2),2)	0.713286	0.429305	1.661490	0.1013
D(Z1(-3),2)	-0.096517	0.265739	-0.363202	0.7176
D(Z1(-4),2)	-0.068400	0.122223	-0.559633	0.5776
C	0.052770	0.027384	1.927000	0.0582
@TREND(1976:1)	-0.001181	0.000576	-2.049386	0.0443

R-squared	0.936209	Mean dependent var	-0.002408
Adjusted R-squared	0.930496	S.D. dependent var	0.371159
S.E. of regression	0.097851	Akaike info criterion	-4.558805
Sum squared resid	0.641511	Schwarz criterion	-4.340853
Log likelihood	70.67433	F-statistic	163.8832
Durbin-Watson stat	2.019519	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.812081	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(Z2,2)
Date: 03/21/98 Time: 14:13
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Z2(-1))	-2.037229	0.534414	-3.812081	0.0003
D(Z2(-1),2)	0.278401	0.474664	0.586522	0.5595
D(Z2(-2),2)	-0.360236	0.362225	-0.994508	0.3236
D(Z2(-3),2)	-0.557736	0.230684	-2.417748	0.0183
D(Z2(-4),2)	-0.274458	0.112490	-2.439838	0.0173
C	0.077750	0.040658	1.912297	0.0601
@TREND(1976:1)	-0.001469	0.000834	-1.760268	0.0829

R-squared	0.836420	Mean dependent var	0.005699
Adjusted R-squared	0.821771	S.D. dependent var	0.339302
S.E. of regression	0.143244	Akaike info criterion	-3.796599
Sum squared resid	1.374756	Schwarz criterion	-3.578647
Log likelihood	42.47273	F-statistic	57.09744
Durbin-Watson stat	1.932774	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.344504	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(Z3,2)
Date: 03/21/98 Time: 14:15
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Z3(-1))	-1.936563	0.445750	-4.344504	0.0000
D(Z3(-1),2)	0.346544	0.396132	0.874819	0.3848
D(Z3(-2),2)	-0.140571	0.293354	-0.479185	0.6334
D(Z3(-3),2)	-0.556685	0.193000	-2.884375	0.0053
D(Z3(-4),2)	-0.100715	0.113559	-0.886894	0.3783
C	0.096358	0.033362	2.888242	0.0052
@TREND(1976:1)	-0.001962	0.000691	-2.839029	0.0060

R-squared	0.936148	Mean dependent var	-0.000955
Adjusted R-squared	0.930430	S.D. dependent var	0.420826
S.E. of regression	0.110998	Akaike info criterion	-4.306674
Sum squared resid	0.825474	Schwarz criterion	-4.088722
Log likelihood	61.34548	F-statistic	163.7164
Durbin-Watson stat	2.032041	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.776817	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(Z4,2)
Date: 03/21/98 Time: 14:16

Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Z4(-1))	-1.825067	0.382068	-4.776817	0.0000
D(Z4(-1),2)	0.535573	0.335774	1.595041	0.1154
D(Z4(-2),2)	0.336097	0.263304	1.276460	0.2062
D(Z4(-3),2)	0.030136	0.197403	0.152662	0.8791
D(Z4(-4),2)	0.125725	0.120894	1.039962	0.3021
C	0.012137	0.033941	0.357598	0.7218
@TREND(1976:1)	-0.000435	0.000719	-0.604944	0.5473

R-squared	0.699154	Mean dependent var	-1.74E-06
Adjusted R-squared	0.672212	S.D. dependent var	0.226432
S.E. of regression	0.129638	Akaike info criterion	-3.996194
Sum squared resid	1.126011	Schwarz criterion	-3.778242
Log likelihood	49.85774	F-statistic	25.95085
Durbin-Watson stat	1.982921	Prob(F-statistic)	0.000000

ADF Test Statistic	-7.218042	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(Z5,2)
Date: 03/21/98 Time: 14:17
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Z5(-1))	-4.997282	0.692332	-7.218042	0.0000
D(Z5(-1),2)	2.898723	0.606935	4.775999	0.0000
D(Z5(-2),2)	1.641409	0.436306	3.762057	0.0004
D(Z5(-3),2)	0.451257	0.267087	1.689554	0.0958
D(Z5(-4),2)	0.135125	0.112894	1.196915	0.2356
C	0.110412	0.028617	3.858279	0.0003
@TREND(1976:1)	-0.002368	0.000601	-3.941718	0.0002

R-squared	0.965687	Mean dependent var	-0.006708
Adjusted R-squared	0.962614	S.D. dependent var	0.462645
S.E. of regression	0.089454	Akaike info criterion	-4.738239
Sum squared resid	0.536138	Schwarz criterion	-4.520287
Log likelihood	77.31339	F-statistic	314.2692
Durbin-Watson stat	1.869595	Prob(F-statistic)	0.000000

ADF Test Statistic	-6.199602	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(Z6,2)
Date: 03/21/98 Time: 14:18
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Z6(-1))	-2.123832	0.342576	-6.199602	0.0000
D(Z6(-1),2)	0.992883	0.297490	3.337534	0.0014
D(Z6(-2),2)	0.678169	0.236301	2.869932	0.0055
D(Z6(-3),2)	0.309274	0.172918	1.788559	0.0782
D(Z6(-4),2)	0.340910	0.115565	2.949937	0.0044
C	0.019026	0.047277	0.402424	0.6887
@TREND(1976:1)	-0.000449	0.000995	-0.451442	0.6531

R-squared	0.645665	Mean dependent var	-0.000132
Adjusted R-squared	0.613934	S.D. dependent var	0.292008
S.E. of regression	0.181437	Akaike info criterion	-3.323877
Sum squared resid	2.205598	Schwarz criterion	-3.105925
Log likelihood	24.98201	F-statistic	20.34778
Durbin-Watson stat	1.935802	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.575170	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(Z7,2)
Date: 03/21/98 Time: 14:19
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Z7(-1))	-1.657371	0.362253	-4.575170	0.0000
D(Z7(-1),2)	0.590263	0.321813	1.834179	0.0711
D(Z7(-2),2)	0.091768	0.261924	0.350362	0.7272
D(Z7(-3),2)	-0.065859	0.180007	-0.365872	0.7156
D(Z7(-4),2)	0.096296	0.125258	0.768784	0.4447
C	-0.018218	0.047171	-0.386207	0.7006
@TREND(1976:1)	-7.53E-05	0.000997	-0.075512	0.9400

R-squared	0.704312	Mean dependent var	-0.002924
Adjusted R-squared	0.677833	S.D. dependent var	0.320066
S.E. of regression	0.181669	Akaike info criterion	-3.321326
Sum squared resid	2.211232	Schwarz criterion	-3.103374
Log likelihood	24.88762	F-statistic	26.59841
Durbin-Watson stat	1.964097	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.990839	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(W1,2)
Date: 03/21/98 Time: 14:20
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(W1(-1))	-2.509692	0.502860	-4.990839	0.0000
D(W1(-1),2)	0.959776	0.440547	2.178602	0.0329
D(W1(-2),2)	0.322554	0.336946	0.957287	0.3419
D(W1(-3),2)	0.081541	0.217154	0.375497	0.7085
D(W1(-4),2)	-0.022250	0.104117	-0.213704	0.8314
C	0.058159	0.082196	0.707569	0.4817
@TREND(1976:1)	0.000241	0.001709	0.141201	0.8881

R-squared	0.753520	Mean dependent var	-0.009849
Adjusted R-squared	0.731447	S.D. dependent var	0.602199
S.E. of regression	0.312072	Akaike info criterion	-2.239227
Sum squared resid	6.525051	Schwarz criterion	-2.021275
Log likelihood	-15.15005	F-statistic	34.13794
Durbin-Watson stat	2.000974	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.715108	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(W2,2)
Date: 03/21/98 Time: 14:20
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(W2(-1))	-1.324001	0.356383	-3.715108	0.0004
D(W2(-1),2)	0.078092	0.316237	0.246943	0.8057
D(W2(-2),2)	-0.157171	0.248809	-0.631694	0.5297
D(W2(-3),2)	-0.225976	0.171031	-1.321259	0.1909
D(W2(-4),2)	-0.107357	0.103252	-1.039752	0.3022
C	0.123249	0.061769	1.995324	0.0501
@TREND(1976:1)	-0.002198	0.001242	-1.770216	0.0812

R-squared	0.651501	Mean dependent var	0.004544
Adjusted R-squared	0.620292	S.D. dependent var	0.340958
S.E. of regression	0.210100	Akaike info criterion	-3.030528
Sum squared resid	2.957511	Schwarz criterion	-2.812576
Log likelihood	14.12808	F-statistic	20.87550
Durbin-Watson stat	1.943509	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.952692	1% Critical Value*	-4.0853

5% Critical Value	-3.4704
10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(W3,2)
Date: 03/21/98 Time: 14:21
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(W3(-1))	-1.933650	0.489198	-3.952692	0.0002
D(W3(-1),2)	0.463035	0.431211	1.073800	0.2868
D(W3(-2),2)	-0.167584	0.334019	-0.501721	0.6175
D(W3(-3),2)	-0.306987	0.213018	-1.441135	0.1542
D(W3(-4),2)	-0.193328	0.119478	-1.618099	0.1103
C	0.044816	0.046583	0.962062	0.3395
@TREND(1976:1)	0.000303	0.000960	0.315764	0.7532

R-squared	0.780474	Mean dependent var	-0.000899
Adjusted R-squared	0.760815	S.D. dependent var	0.358148
S.E. of regression	0.175158	Akaike info criterion	-3.394318
Sum squared resid	2.055579	Schwarz criterion	-3.176366
Log likelihood	27.58833	F-statistic	39.70058
Durbin-Watson stat	1.952779	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.194690	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(W4,2)
Date: 03/21/98 Time: 14:21
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(W4(-1))	-2.851409	0.548908	-5.194690	0.0000
D(W4(-1),2)	1.112705	0.483371	2.301968	0.0245
D(W4(-2),2)	0.520449	0.376868	1.380985	0.1719
D(W4(-3),2)	0.121367	0.250652	0.484205	0.6298
D(W4(-4),2)	0.009797	0.122961	0.079678	0.9367
C	0.000424	0.042370	0.010012	0.9920
@TREND(1976:1)	0.001091	0.000914	1.194152	0.2366

R-squared	0.789663	Mean dependent var	-0.002023
Adjusted R-squared	0.770827	S.D. dependent var	0.341529
S.E. of regression	0.163497	Akaike info criterion	-3.532109
Sum squared resid	1.790987	Schwarz criterion	-3.314157
Log likelihood	32.68659	F-statistic	41.92280

Durbin-Watson stat	2.010814	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.976083	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(W5,2)
Date: 03/21/98 Time: 14:22
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(W5(-1))	-1.931284	0.388113	-4.976083	0.0000
D(W5(-1),2)	0.698342	0.345436	2.021624	0.0472
D(W5(-2),2)	0.256401	0.273609	0.937106	0.3521
D(W5(-3),2)	0.038412	0.188820	0.203430	0.8394
D(W5(-4),2)	0.222391	0.117454	1.893429	0.0626
C	0.082325	0.089257	0.922337	0.3597
@TREND(1976:1)	-0.001268	0.001867	-0.679109	0.4994

R-squared	0.727392	Mean dependent var	-0.009750
Adjusted R-squared	0.702979	S.D. dependent var	0.628484
S.E. of regression	0.342521	Akaike info criterion	-2.053027
Sum squared resid	7.860493	Schwarz criterion	-1.835075
Log likelihood	-22.03946	F-statistic	29.79567
Durbin-Watson stat	2.049813	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.192510	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(W6,2)
Date: 03/21/98 Time: 14:23
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(W6(-1))	-1.845234	0.440126	-4.192510	0.0001
D(W6(-1),2)	0.393780	0.388646	1.013210	0.3146
D(W6(-2),2)	0.029942	0.309079	0.096875	0.9231
D(W6(-3),2)	-0.126374	0.215639	-0.586041	0.5598
D(W6(-4),2)	-0.054749	0.122537	-0.446797	0.6565
C	0.066286	0.059185	1.119967	0.2667
@TREND(1976:1)	-0.001157	0.001233	-0.938711	0.3513

R-squared	0.698729	Mean dependent var	0.001609
Adjusted R-squared	0.671749	S.D. dependent var	0.391986

S.E. of regression	0.224581	Akaike info criterion	-2.897219
Sum squared resid	3.379262	Schwarz criterion	-2.679267
Log likelihood	9.195639	F-statistic	25.89848
Durbin-Watson stat	1.998730	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.124135	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(W7,2)
Date: 03/21/98 Time: 14:24
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(W7(-1))	-1.506687	0.365334	-4.124135	0.0001
D(W7(-1),2)	0.255861	0.320333	0.798736	0.4273
D(W7(-2),2)	-0.012741	0.250920	-0.050776	0.9597
D(W7(-3),2)	-0.217708	0.180430	-1.206608	0.2318
D(W7(-4),2)	0.043005	0.114353	0.376076	0.7080
C	-0.053442	0.042960	-1.244003	0.2178
@TREND(1976:1)	0.001111	0.000908	1.223551	0.2254

R-squared	0.699152	Mean dependent var	0.004062
Adjusted R-squared	0.672210	S.D. dependent var	0.280245
S.E. of regression	0.160449	Akaike info criterion	-3.569748
Sum squared resid	1.724829	Schwarz criterion	-3.351796
Log likelihood	34.07922	F-statistic	25.95059
Durbin-Watson stat	1.953440	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.449644	1% Critical Value*	-4.1728
		5% Critical Value	-3.5112
		10% Critical Value	-3.1854

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(P1,3)
Date: 03/21/98 Time: 14:25
Sample(adjusted): 1984:4 1995:4
Included observations: 45 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(P1(-1),2)	-4.278917	0.961631	-4.449644	0.0001
D(P1(-1),3)	2.039426	0.851907	2.393953	0.0217
D(P1(-2),3)	0.906982	0.637480	1.422761	0.1630
D(P1(-3),3)	0.219326	0.376744	0.582162	0.5639
D(P1(-4),3)	0.009933	0.153362	0.064770	0.9487
C	-0.017810	0.193849	-0.091875	0.9273
@TREND(1976:1)	0.000446	0.003315	0.134559	0.8937

R-squared	0.889789	Mean dependent var	-0.004715
Adjusted R-squared	0.872387	S.D. dependent var	0.806200
S.E. of regression	0.287998	Akaike info criterion	-2.347569
Sum squared resid	3.151828	Schwarz criterion	-2.066532
Log likelihood	-4.031937	F-statistic	51.13229
Durbin-Watson stat	1.986562	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.924258	1% Critical Value*	-4.1678
		5% Critical Value	-3.5088
		10% Critical Value	-3.1840

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(P2,2)
Date: 03/21/98 Time: 14:26
Sample(adjusted): 1984:3 1995:4
Included observations: 46 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(P2(-1))	-2.111762	0.538130	-3.924258	0.0003
D(P2(-1),2)	0.715319	0.474594	1.507224	0.1398
D(P2(-2),2)	0.421396	0.368666	1.143029	0.2600
D(P2(-3),2)	0.088031	0.266104	0.330815	0.7426
D(P2(-4),2)	0.170222	0.155981	1.091297	0.2818
C	0.161475	0.157034	1.028276	0.3102
@TREND(1976:1)	-0.001401	0.002667	-0.525196	0.6024

R-squared	0.747728	Mean dependent var	0.000572
Adjusted R-squared	0.708917	S.D. dependent var	0.444010
S.E. of regression	0.239553	Akaike info criterion	-2.718693
Sum squared resid	2.238041	Schwarz criterion	-2.440421
Log likelihood	4.258757	F-statistic	19.26581
Durbin-Watson stat	2.011011	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.515066	1% Critical Value*	-4.1728
		5% Critical Value	-3.5112
		10% Critical Value	-3.1854

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(P3,3)
Date: 03/21/98 Time: 14:27
Sample(adjusted): 1984:4 1995:4
Included observations: 45 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(P3(-1),2)	-3.912262	0.866491	-4.515066	0.0001
D(P3(-1),3)	1.788606	0.759876	2.353813	0.0239
D(P3(-2),3)	0.933246	0.565241	1.651059	0.1070
D(P3(-3),3)	0.244914	0.350756	0.698246	0.4893

D(P3(-4),3)	0.026116	0.146322	0.178486	0.8593
C	0.011384	0.198500	0.057348	0.9546
@TREND(1976:1)	-0.000332	0.003394	-0.097685	0.9227

R-squared	0.904222	Mean dependent var	0.019429
Adjusted R-squared	0.889099	S.D. dependent var	0.882841
S.E. of regression	0.294002	Akaike info criterion	-2.306301
Sum squared resid	3.284618	Schwarz criterion	-2.025265
Log likelihood	-4.960460	F-statistic	59.79156
Durbin-Watson stat	1.981090	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.082899	1% Critical Value*	-4.1728
		5% Critical Value	-3.5112
		10% Critical Value	-3.1854

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(P4,3)
Date: 03/21/98 Time: 14:29
Sample(adjusted): 1984:4 1995:4
Included observations: 45 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(P4(-1),2)	-4.754912	0.935472	-5.082899	0.0000
D(P4(-1),3)	2.465380	0.809155	3.046858	0.0042
D(P4(-2),3)	1.396062	0.581338	2.401464	0.0213
D(P4(-3),3)	0.506692	0.343989	1.472989	0.1490
D(P4(-4),3)	0.056132	0.138183	0.406213	0.6869
C	0.056544	0.306333	0.184582	0.8545
@TREND(1976:1)	-0.001029	0.005241	-0.196308	0.8454

R-squared	0.912551	Mean dependent var	0.022975
Adjusted R-squared	0.898743	S.D. dependent var	1.406240
S.E. of regression	0.447478	Akaike info criterion	-1.466221
Sum squared resid	7.608990	Schwarz criterion	-1.185184
Log likelihood	-23.86226	F-statistic	66.08969
Durbin-Watson stat	1.941132	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.901364	1% Critical Value*	-4.1678
		5% Critical Value	-3.5088
		10% Critical Value	-3.1840

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(P5,2)
Date: 03/21/98 Time: 14:30
Sample(adjusted): 1984:3 1995:4
Included observations: 46 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(P5(-1))	-2.296413	0.588618	-3.901364	0.0004

D(P5(-1),2)	0.801001	0.514697	1.556257	0.1277
D(P5(-2),2)	0.453574	0.418942	1.082665	0.2856
D(P5(-3),2)	0.265355	0.303000	0.875759	0.3865
D(P5(-4),2)	0.087438	0.177000	0.494003	0.6241
C	0.101123	0.510636	0.198034	0.8440
@TREND(1976:1)	-0.001102	0.008793	-0.125349	0.9009

R-squared	0.704038	Mean dependent var	-0.037692
Adjusted R-squared	0.658505	S.D. dependent var	1.349693
S.E. of regression	0.788728	Akaike info criterion	-0.335400
Sum squared resid	24.26157	Schwarz criterion	-0.057128
Log likelihood	-50.55697	F-statistic	15.46226
Durbin-Watson stat	2.040582	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.230376	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(P6,2)
Date: 03/21/98 Time: 14:31
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(P6(-1))	-1.752833	0.414344	-4.230376	0.0001
D(P6(-1),2)	0.320916	0.367893	0.872307	0.3862
D(P6(-2),2)	0.092412	0.291344	0.317190	0.7521
D(P6(-3),2)	-0.134724	0.210389	-0.640355	0.5241
D(P6(-4),2)	0.010252	0.119488	0.085802	0.9319
C	-0.012660	0.047996	-0.263765	0.7928
@TREND(1976:1)	0.000871	0.001030	0.845483	0.4009

R-squared	0.738656	Mean dependent var	0.005017
Adjusted R-squared	0.715252	S.D. dependent var	0.344649
S.E. of regression	0.183911	Akaike info criterion	-3.296790
Sum squared resid	2.266158	Schwarz criterion	-3.078838
Log likelihood	23.97978	F-statistic	31.56123
Durbin-Watson stat	1.920401	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.080491	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X1,2)
Date: 03/21/98 Time: 14:33
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X1(-1))	-1.858502	0.455460	-4.080491	0.0001
D(X1(-1),2)	0.343148	0.405788	0.845634	0.4008
D(X1(-2),2)	-0.055324	0.322818	-0.171379	0.8644
D(X1(-3),2)	-0.172509	0.221032	-0.780470	0.4379
D(X1(-4),2)	0.004192	0.123106	0.034056	0.9729
C	-0.042440	0.061115	-0.694433	0.4898
@TREND(1976:1)	0.002000	0.001318	1.517370	0.1339

R-squared	0.735955	Mean dependent var	0.006414
Adjusted R-squared	0.712309	S.D. dependent var	0.438490
S.E. of regression	0.235192	Akaike info criterion	-2.804888
Sum squared resid	3.706128	Schwarz criterion	-2.586936
Log likelihood	5.779414	F-statistic	31.12410
Durbin-Watson stat	1.973498	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.771216	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X2,2)
Date: 03/21/98 Time: 14:34
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X2(-1))	-1.748795	0.366530	-4.771216	0.0000
D(X2(-1),2)	0.395385	0.324084	1.220006	0.2267
D(X2(-2),2)	0.003020	0.258783	0.011670	0.9907
D(X2(-3),2)	-0.098876	0.181193	-0.545695	0.5871
D(X2(-4),2)	0.093860	0.108861	0.862199	0.3917
C	-0.029969	0.081418	-0.368086	0.7140
@TREND(1976:1)	0.001086	0.001699	0.639363	0.5248

R-squared	0.730079	Mean dependent var	0.001884
Adjusted R-squared	0.705907	S.D. dependent var	0.570813
S.E. of regression	0.309554	Akaike info criterion	-2.255430
Sum squared resid	6.420178	Schwarz criterion	-2.037478
Log likelihood	-14.55054	F-statistic	30.20348
Durbin-Watson stat	1.989372	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.526865	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X3,2)
Date: 03/21/98 Time: 14:34

Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X3(-1))	-1.753353	0.387322	-4.526865	0.0000
D(X3(-1),2)	0.464399	0.346421	1.340561	0.1846
D(X3(-2),2)	0.096142	0.275688	0.348736	0.7284
D(X3(-3),2)	-0.063836	0.195476	-0.326569	0.7450
D(X3(-4),2)	0.173128	0.119724	1.446057	0.1528
C	-0.047770	0.080874	-0.590667	0.5567
@TREND(1976:1)	0.001241	0.001705	0.727648	0.4694

R-squared	0.726863	Mean dependent var	0.010665
Adjusted R-squared	0.702403	S.D. dependent var	0.569557
S.E. of regression	0.310708	Akaike info criterion	-2.247989
Sum squared resid	6.468131	Schwarz criterion	-2.030037
Log likelihood	-14.82587	F-statistic	29.71632
Durbin-Watson stat	2.018287	Prob(F-statistic)	0.000000

ADF Test Statistic	-3.680891	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X4,2)
Date: 03/21/98 Time: 14:35
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X4(-1))	-1.542439	0.419040	-3.680891	0.0005
D(X4(-1),2)	0.209044	0.378618	0.552124	0.5827
D(X4(-2),2)	-0.201373	0.289701	-0.695108	0.4894
D(X4(-3),2)	-0.482705	0.196892	-2.451621	0.0168
D(X4(-4),2)	-0.026608	0.126557	-0.210243	0.8341
C	-0.043229	0.067732	-0.638241	0.5255
@TREND(1976:1)	0.001624	0.001460	1.112295	0.2700

R-squared	0.842675	Mean dependent var	0.005218
Adjusted R-squared	0.828587	S.D. dependent var	0.623624
S.E. of regression	0.258193	Akaike info criterion	-2.618276
Sum squared resid	4.466477	Schwarz criterion	-2.400324
Log likelihood	-1.125241	F-statistic	59.81184
Durbin-Watson stat	1.989354	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.148948	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X5,2)
Date: 03/21/98 Time: 14:36
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X5(-1))	-1.770407	0.343839	-5.148948	0.0000
D(X5(-1),2)	0.521678	0.298979	1.744861	0.0856
D(X5(-2),2)	0.374968	0.250362	1.497700	0.1389
D(X5(-3),2)	0.345819	0.192406	1.797337	0.0768
D(X5(-4),2)	0.192987	0.121355	1.590268	0.1165
C	-0.014954	0.063057	-0.237156	0.8133
@TREND(1976:1)	0.000362	0.001326	0.272687	0.7859

R-squared	0.622560	Mean dependent var	0.006277
Adjusted R-squared	0.588759	S.D. dependent var	0.379564
S.E. of regression	0.243407	Akaike info criterion	-2.736226
Sum squared resid	3.969541	Schwarz criterion	-2.518273
Log likelihood	3.238896	F-statistic	18.41860
Durbin-Watson stat	2.054965	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.478909	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X6,2)
Date: 03/21/98 Time: 14:37
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X6(-1))	-1.365386	0.304848	-4.478909	0.0000
D(X6(-1),2)	0.271301	0.271596	0.998914	0.3214
D(X6(-2),2)	0.211619	0.222856	0.949579	0.3457
D(X6(-3),2)	0.043317	0.177246	0.244388	0.8077
D(X6(-4),2)	0.174412	0.119792	1.455962	0.1501
C	-0.030698	0.066453	-0.461954	0.6456
@TREND(1976:1)	0.000822	0.001401	0.587161	0.5591

R-squared	0.608744	Mean dependent var	-0.000282
Adjusted R-squared	0.573706	S.D. dependent var	0.392214
S.E. of regression	0.256081	Akaike info criterion	-2.634706
Sum squared resid	4.393690	Schwarz criterion	-2.416754
Log likelihood	-0.517310	F-statistic	17.37389
Durbin-Watson stat	2.021729	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.495897	1% Critical Value*	-4.2505
		5% Critical Value	-3.5468
		10% Critical Value	-3.2056

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X7,3)
Date: 03/21/98 Time: 14:38
Sample(adjusted): 1987:3 1995:4
Included observations: 34 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X7(-1),2)	-4.108415	0.747542	-5.495897	0.0000
D(X7(-1),3)	1.903104	0.621802	3.060629	0.0048
D(X7(-2),3)	0.863722	0.405452	2.130269	0.0421
D(X7(-3),3)	0.233859	0.176875	1.322175	0.1968
C	-0.135944	0.156239	-0.870107	0.3916
@TREND(1976:1)	0.002138	0.002473	0.864690	0.3946

R-squared	0.888801	Mean dependent var	0.000285
Adjusted R-squared	0.868944	S.D. dependent var	0.387969
S.E. of regression	0.140451	Akaike info criterion	-3.767006
Sum squared resid	0.552343	Schwarz criterion	-3.497649
Log likelihood	21.79520	F-statistic	44.76018
Durbin-Watson stat	1.944805	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.124230	1% Critical Value*	-4.2412
		5% Critical Value	-3.5426
		10% Critical Value	-3.2032

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X8,2)
Date: 03/21/98 Time: 14:39
Sample(adjusted): 1987:2 1995:4
Included observations: 35 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X8(-1))	-2.263247	0.548768	-4.124230	0.0003
D(X8(-1),2)	0.810523	0.457080	1.773264	0.0867
D(X8(-2),2)	0.424122	0.331615	1.278958	0.2111
D(X8(-3),2)	0.195568	0.190028	1.029158	0.3119
C	0.137200	0.530213	0.258765	0.7976
@TREND(1976:1)	0.001384	0.008525	0.162299	0.8722

R-squared	0.697647	Mean dependent var	0.023594
Adjusted R-squared	0.645517	S.D. dependent var	0.844610
S.E. of regression	0.502868	Akaike info criterion	-1.220050
Sum squared resid	7.333411	Schwarz criterion	-0.953419
Log likelihood	-22.31197	F-statistic	13.38287
Durbin-Watson stat	1.813273	Prob(F-statistic)	0.000001

ADF Test Statistic	-5.341827	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X9,2)
Date: 03/21/98 Time: 14:40
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X9(-1))	-2.446792	0.458044	-5.341827	0.0000
D(X9(-1),2)	0.994828	0.404341	2.460369	0.0165
D(X9(-2),2)	0.435753	0.308865	1.410821	0.1629
D(X9(-3),2)	0.025351	0.205340	0.123461	0.9021
D(X9(-4),2)	0.157264	0.117440	1.339102	0.1851
C	-0.042007	0.093232	-0.450559	0.6538
@TREND(1976:1)	0.002531	0.001986	1.274605	0.2069

R-squared	0.786646	Mean dependent var	0.004604
Adjusted R-squared	0.767540	S.D. dependent var	0.744979
S.E. of regression	0.359185	Akaike info criterion	-1.958019
Sum squared resid	8.643928	Schwarz criterion	-1.740067
Log likelihood	-25.55475	F-statistic	41.17211
Durbin-Watson stat	2.028132	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.711372	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X10,2)
Date: 03/21/98 Time: 14:41
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X10(-1))	-1.468616	0.311717	-4.711372	0.0000
D(X10(-1),2)	0.214749	0.273645	0.784770	0.4354
D(X10(-2),2)	-0.110653	0.227605	-0.486163	0.6284
D(X10(-3),2)	-0.051768	0.165024	-0.313699	0.7547
D(X10(-4),2)	0.081059	0.106770	0.759191	0.4504
C	-0.045321	0.076969	-0.588817	0.5580
@TREND(1976:1)	0.000982	0.001613	0.608641	0.5448

R-squared	0.692685	Mean dependent var	-0.000721
Adjusted R-squared	0.665164	S.D. dependent var	0.505763
S.E. of regression	0.292660	Akaike info criterion	-2.367671
Sum squared resid	5.738538	Schwarz criterion	-2.149719
Log likelihood	-10.39761	F-statistic	25.16953
Durbin-Watson stat	2.035194	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.053592	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X11,2)
Date: 03/21/98 Time: 14:42
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X11(-1))	-1.489167	0.367370	-4.053592	0.0001
D(X11(-1),2)	0.249656	0.324722	0.768829	0.4447
D(X11(-2),2)	0.090334	0.258727	0.349146	0.7281
D(X11(-3),2)	-0.111154	0.192459	-0.577548	0.5655
D(X11(-4),2)	-0.011202	0.120624	-0.092871	0.9263
C	0.083896	0.069684	1.203951	0.2328
@TREND(1976:1)	-0.001607	0.001453	-1.106266	0.2726

R-squared	0.637507	Mean dependent var	0.002355
Adjusted R-squared	0.605045	S.D. dependent var	0.405953
S.E. of regression	0.255123	Akaike info criterion	-2.642201
Sum squared resid	4.360883	Schwarz criterion	-2.424249
Log likelihood	-0.240003	F-statistic	19.63854
Durbin-Watson stat	2.010891	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.593647	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X12,2)
Date: 03/21/98 Time: 14:43
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X12(-1))	-1.611444	0.350798	-4.593647	0.0000
D(X12(-1),2)	0.199639	0.308130	0.647904	0.5193
D(X12(-2),2)	-0.033231	0.262559	-0.126565	0.8997
D(X12(-3),2)	0.068309	0.190886	0.357849	0.7216
D(X12(-4),2)	0.100833	0.110694	0.910913	0.3656
C	-0.042612	0.075731	-0.562678	0.5755
@TREND(1976:1)	0.001692	0.001600	1.057147	0.2942

R-squared	0.715660	Mean dependent var	0.007408
Adjusted R-squared	0.690197	S.D. dependent var	0.522264
S.E. of regression	0.290692	Akaike info criterion	-2.381168
Sum squared resid	5.661607	Schwarz criterion	-2.163216

Log likelihood	-9.898230	F-statistic	28.10562
Durbin-Watson stat	2.020604	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.849271	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(X13,2)
Date: 03/21/98 Time: 14:44
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X13(-1))	-2.130443	0.439333	-4.849271	0.0000
D(X13(-1),2)	0.574353	0.385101	1.491437	0.1405
D(X13(-2),2)	0.084847	0.295081	0.287539	0.7746
D(X13(-3),2)	-0.215259	0.195079	-1.103446	0.2738
D(X13(-4),2)	-0.002356	0.108409	-0.021736	0.9827
C	-0.015697	0.075902	-0.206811	0.8368
@TREND(1976:1)	0.001433	0.001589	0.902060	0.3703

R-squared	0.804975	Mean dependent var	0.001255
Adjusted R-squared	0.787510	S.D. dependent var	0.630029
S.E. of regression	0.290422	Akaike info criterion	-2.383023
Sum squared resid	5.651115	Schwarz criterion	-2.165071
Log likelihood	-9.829596	F-statistic	46.09103
Durbin-Watson stat	2.012998	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.574008	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(G1,2)
Date: 03/21/98 Time: 14:45
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(G1(-1))	-1.803570	0.394308	-4.574008	0.0000
D(G1(-1),2)	0.558351	0.346923	1.609435	0.1122
D(G1(-2),2)	0.205775	0.274841	0.748708	0.4567
D(G1(-3),2)	-0.025482	0.198259	-0.128527	0.8981
D(G1(-4),2)	0.060879	0.125621	0.484619	0.6295
C	0.020248	0.034431	0.588081	0.5585
@TREND(1976:1)	-8.77E-05	0.000714	-0.122811	0.9026

R-squared	0.645947	Mean dependent var	-0.000241

Adjusted R-squared	0.614241	S.D. dependent var	0.210105
S.E. of regression	0.130495	Akaike info criterion	-3.983018
Sum squared resid	1.140947	Schwarz criterion	-3.765066
Log likelihood	49.37021	F-statistic	20.37285
Durbin-Watson stat	2.033116	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.353994	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(G2,2)
Date: 03/21/98 Time: 14:46
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(G2(-1))	-2.906613	0.542887	-5.353994	0.0000
D(G2(-1),2)	0.974366	0.485066	2.008731	0.0486
D(G2(-2),2)	0.336593	0.377565	0.891482	0.3759
D(G2(-3),2)	-0.020947	0.246839	-0.084861	0.9326
D(G2(-4),2)	0.025323	0.120099	0.210850	0.8336
C	0.011186	0.025485	0.438927	0.6621
@TREND(1976:1)	0.000383	0.000524	0.731059	0.4673

R-squared	0.857078	Mean dependent var	0.000481
Adjusted R-squared	0.844279	S.D. dependent var	0.243395
S.E. of regression	0.096047	Akaike info criterion	-4.596009
Sum squared resid	0.618083	Schwarz criterion	-4.378057
Log likelihood	72.05088	F-statistic	66.96432
Durbin-Watson stat	2.060584	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.085378	1% Critical Value*	-4.0928
		5% Critical Value	-3.4739
		10% Critical Value	-3.1640

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(G3,2)
Date: 03/21/98 Time: 14:47
Sample(adjusted): 1978:3 1995:4
Included observations: 70 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(G3(-1))	-3.383620	0.665362	-5.085378	0.0000
D(G3(-1),2)	1.449399	0.580261	2.497839	0.0151
D(G3(-2),2)	0.670757	0.441350	1.519783	0.1336
D(G3(-3),2)	0.061877	0.283373	0.218358	0.8279
D(G3(-4),2)	-0.139921	0.129169	-1.083238	0.2828
C	-0.039496	0.052668	-0.749896	0.4561

@TREND(1976:1)	0.001931	0.001146	1.685700	0.0968

R-squared	0.845045	Mean dependent var	0.002394
Adjusted R-squared	0.830287	S.D. dependent var	0.430559
S.E. of regression	0.177374	Akaike info criterion	-3.364350
Sum squared resid	1.982077	Schwarz criterion	-3.139501
Log likelihood	25.42656	F-statistic	57.26150
Durbin-Watson stat	1.908543	Prob(F-statistic)	0.000000

ADF Test Statistic	-6.214635	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(G4,2)
Date: 03/21/98 Time: 14:48
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(G4(-1))	-4.363774	0.702177	-6.214635	0.0000
D(G4(-1),2)	2.290151	0.616400	3.715362	0.0004
D(G4(-2),2)	1.165256	0.456213	2.554193	0.0129
D(G4(-3),2)	0.253514	0.275133	0.921426	0.3601
D(G4(-4),2)	0.044382	0.122079	0.363549	0.7173
C	0.020532	0.037507	0.547402	0.5859
@TREND(1976:1)	0.000803	0.000775	1.036455	0.3037

R-squared	0.878139	Mean dependent var	0.006806
Adjusted R-squared	0.867226	S.D. dependent var	0.389695
S.E. of regression	0.141998	Akaike info criterion	-3.814074
Sum squared resid	1.350941	Schwarz criterion	-3.596122
Log likelihood	43.11930	F-statistic	80.46780
Durbin-Watson stat	1.965928	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.938687	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(G5,2)
Date: 03/21/98 Time: 14:49
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(G5(-1))	-2.279843	0.461629	-4.938687	0.0000
D(G5(-1),2)	0.846673	0.397996	2.127341	0.0371
D(G5(-2),2)	0.360161	0.309778	1.162642	0.2491

D(G5(-3),2)	0.067491	0.210069	0.321282	0.7490
D(G5(-4),2)	-0.015374	0.119441	-0.128716	0.8980
C	0.042103	0.045939	0.916487	0.3627
@TREND(1976:1)	0.000207	0.000950	0.217567	0.8284

R-squared	0.695661	Mean dependent var	-0.001863
Adjusted R-squared	0.668407	S.D. dependent var	0.302533
S.E. of regression	0.174211	Akaike info criterion	-3.405161
Sum squared resid	2.033411	Schwarz criterion	-3.187209
Log likelihood	27.98952	F-statistic	25.52493
Durbin-Watson stat	1.995445	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.499633	1% Critical Value*	-4.0928
		5% Critical Value	-3.4739
		10% Critical Value	-3.1640

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(G6,2)
Date: 03/21/98 Time: 14:49
Sample(adjusted): 1978:3 1995:4
Included observations: 70 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(G6(-1))	-2.882728	0.524167	-5.499633	0.0000
D(G6(-1),2)	1.196715	0.463369	2.582640	0.0121
D(G6(-2),2)	0.706213	0.359338	1.965319	0.0538
D(G6(-3),2)	0.264631	0.246623	1.073018	0.2874
D(G6(-4),2)	0.189542	0.126922	1.493366	0.1403
C	0.020698	0.079982	0.258786	0.7966
@TREND(1976:1)	0.000305	0.001630	0.186939	0.8523

R-squared	0.807154	Mean dependent var	0.006986
Adjusted R-squared	0.788788	S.D. dependent var	0.599072
S.E. of regression	0.275321	Akaike info criterion	-2.484997
Sum squared resid	4.775499	Schwarz criterion	-2.260147
Log likelihood	-5.350810	F-statistic	43.94754
Durbin-Watson stat	1.994395	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.355510	1% Critical Value*	-4.0853
		5% Critical Value	-3.4704
		10% Critical Value	-3.1620

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(G7,2)
Date: 03/21/98 Time: 14:50
Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(G7(-1))	-2.147103	0.492963	-4.355510	0.0000
D(G7(-1),2)	0.528452	0.436852	1.209682	0.2307
D(G7(-2),2)	0.050571	0.346219	0.146068	0.8843
D(G7(-3),2)	-0.137734	0.238126	-0.578408	0.5649
D(G7(-4),2)	-0.058098	0.130324	-0.445793	0.6572
C	0.000788	0.032587	0.024168	0.9808
@TREND(1976:1)	0.000678	0.000683	0.992906	0.3243

R-squared	0.751075	Mean dependent var	0.000554
Adjusted R-squared	0.728783	S.D. dependent var	0.239588
S.E. of regression	0.124774	Akaike info criterion	-4.072687
Sum squared resid	1.043091	Schwarz criterion	-3.854735
Log likelihood	52.68798	F-statistic	33.69294
Durbin-Watson stat	1.942599	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.380663	1% Critical Value*	-4.2242
		5% Critical Value	-3.5348
		10% Critical Value	-3.1988

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(G8,3)
Date: 03/21/98 Time: 14:51
Sample(adjusted): 1986:4 1995:4
Included observations: 37 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(G8(-1),2)	-5.805078	1.078878	-5.380663	0.0000
D(G8(-1),3)	3.420170	0.955478	3.579537	0.0012
D(G8(-2),3)	1.951326	0.725026	2.691389	0.0115
D(G8(-3),3)	0.905797	0.426088	2.125843	0.0419
D(G8(-4),3)	0.253292	0.173458	1.460251	0.1546
C	0.014380	0.133109	0.108034	0.9147
@TREND(1976:1)	-0.000164	0.002149	-0.076358	0.9396

R-squared	0.912878	Mean dependent var	-0.006623
Adjusted R-squared	0.895454	S.D. dependent var	0.431301
S.E. of regression	0.139455	Akaike info criterion	-3.771368
Sum squared resid	0.583431	Schwarz criterion	-3.466600
Log likelihood	24.26959	F-statistic	52.39093
Durbin-Watson stat	2.017906	Prob(F-statistic)	0.000000

ADF Test Statistic	-4.918318	1% Critical Value*	-4.2242
		5% Critical Value	-3.5348
		10% Critical Value	-3.1988

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(J1,3)
Date: 03/21/98 Time: 14:52
Sample(adjusted): 1986:4 1995:4
Included observations: 37 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(J1(-1),2)	-6.004347	1.220813	-4.918318	0.0000
D(J1(-1),3)	3.520064	1.085045	3.244165	0.0029
D(J1(-2),3)	1.908280	0.812371	2.349025	0.0256
D(J1(-3),3)	0.723261	0.470568	1.536996	0.1348
D(J1(-4),3)	0.138197	0.181037	0.763364	0.4512
C	-0.060208	0.623129	-0.096622	0.9237
@TREND(1976:1)	0.001112	0.010062	0.110526	0.9127

R-squared	0.916372	Mean dependent var	0.013541
Adjusted R-squared	0.899647	S.D. dependent var	2.062690
S.E. of regression	0.653431	Akaike info criterion	-0.682378
Sum squared resid	12.80917	Schwarz criterion	-0.377610
Log likelihood	-32.87673	F-statistic	54.78873
Durbin-Watson stat	2.092296	Prob(F-statistic)	0.000000

ADF Test Statistic	-5.562305	1% Critical Value*	-4.2165
		5% Critical Value	-3.5312
		10% Critical Value	-3.1968

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation
LS // Dependent Variable is D(J2,2)
Date: 03/21/98 Time: 14:53
Sample(adjusted): 1986:3 1995:4
Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(J2(-1))	-5.984550	1.075912	-5.562305	0.0000
D(J2(-1),2)	3.677857	0.940115	3.912136	0.0005
D(J2(-2),2)	2.100351	0.684973	3.066326	0.0045
D(J2(-3),2)	0.772210	0.399787	1.931551	0.0626
D(J2(-4),2)	0.186929	0.166032	1.125862	0.2689
C	0.058916	0.729672	0.080744	0.9362
@TREND(1976:1)	-0.002571	0.011856	-0.216855	0.8297

R-squared	0.932470	Mean dependent var	-0.037378
Adjusted R-squared	0.919400	S.D. dependent var	2.808668
S.E. of regression	0.797384	Akaike info criterion	-0.288016
Sum squared resid	19.71046	Schwarz criterion	0.013645
Log likelihood	-41.44736	F-statistic	71.34300
Durbin-Watson stat	2.054535	Prob(F-statistic)	0.000000

3. JOHANSEN COINTEGRATION TESTS

3.1 AUSTRIA INBOUNDS

1.Denmark to Austria
Date: 03/22/98 Time: 14:47
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: Z1 IN2 CL1 EX1 FF1
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No.CE(s)
0.422936	80.45140	68.52	76.07	None **
0.236861	39.21625	47.21	54.46	At most 1
0.155697	18.94263	29.68	35.65	At most 2
0.076198	6.249375	15.41	20.04	At most 3
0.004060	0.305093	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

Z1	IN2	CL1	EX1	FF1
0.290463	3.468017	-4.295190	-3.711322	1.482563
-1.615166	0.561573	1.945269	-1.819898	-9.584324
0.604170	-0.314636	-1.738262	-0.211967	5.726801
-0.540632	-0.048614	-0.197398	0.030202	-0.841291
1.567376	0.176158	0.095183	-0.852127	-1.191960

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

Z1	IN2	CL1	EX1	FF1	C
1.000000	11.93960	-14.78737	-12.77725	5.104132	-93.76891
	(13.4201)	(15.6910)	(14.5045)	(4.57234)	

Log likelihood 955.0439

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

Z1	IN2	CL1	EX1	FF1	C
1.000000	0.000000	-1.588729	0.733322	5.910475	-0.860756
		(0.40102)	(0.26325)	(1.36869)	
0.000000	1.000000	-1.105451	-1.131576	-0.067535	-7.781511
		(0.12540)	(0.08232)	(0.42800)	

Log likelihood 965.1807

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

Z1	IN2	CL1	EX1	FF1	C
1.000000	0.000000	0.000000	2.159592	2.899207	5.671691
			(2.01437)	(2.31364)	
0.000000	1.000000	0.000000	-0.139165	-2.162801	-3.236180
			(1.23742)	(1.42126)	
0.000000	0.000000	1.000000	0.897743	-1.895395	4.111744
			(1.12211)	(1.28882)	

Log likelihood 971.5274

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

Z1	IN2	CL1	EX1	FF1	C
1.000000	0.000000	0.000000	0.000000	2.509614	4.003977
				(2.79738)	
0.000000	1.000000	0.000000	0.000000	-2.137695	-3.128712
				(1.34957)	
0.000000	0.000000	1.000000	0.000000	-2.057349	3.418475
				(1.20055)	
0.000000	0.000000	0.000000	1.000000	0.180401	0.772235
				(1.61660)	

Log likelihood 974.4995

	Z1	IN2	CL1	EX1	FF1	C
Mean	-5.379141	4.297727	-2.274794	-0.889773	0.555650	
Median	-5.343117	4.386585	-2.313862	-0.826254	0.533550	
Maximum	-5.007455	4.705138	-1.798049	-0.696235	0.812270	
Minimum	-5.855392	3.758088	-2.821565	-1.360263	0.360588	
Std. Dev.	0.191423	0.236119	0.279932	0.196101	0.103948	
Skewness	-0.640959	-0.608858	0.162641	-0.818772	0.599076	
Kurtosis	2.952341	2.489880	2.192575	2.155148	2.608740	
Jarque-Bera	5.485287	5.810174	2.525812	11.31776	5.295503	
Probability	0.064400	0.054744	0.282831	0.003486	0.070810	
Observations	80	80	80	80	80	

2. France to Austria
Date: 03/22/98 Time: 17:07
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: Z2 IN3 CL2 EX2 FF2
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.386999	91.91830	68.52	76.07	None **
0.308989	55.21416	47.21	54.46	At most 1 **
0.190674	27.49423	29.68	35.65	At most 2
0.080833	11.62769	15.41	20.04	At most 3
0.068304	5.306129	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

Z2	IN3	CL2	EX2	FF2
0.897415	-5.011746	3.304944	4.550480	7.739116
0.642435	-3.725742	5.022042	4.365401	-2.789908
0.493734	-0.717658	-0.622546	-1.517823	2.674581
0.678543	0.774309	0.881439	-0.511946	-5.813349
0.640024	0.470157	0.117376	-1.277312	-1.012111

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

Z2	IN3	CL2	EX2	FF2	C
1.000000	-5.584646	3.682736	5.070651	8.623785	35.22025
	(1.04152)	(0.73580)	(1.18422)	(2.56371)	

Log likelihood 967.8029

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

Z2	IN3	CL2	EX2	FF2	C
1.000000	0.000000	-103.8312	-39.77207	345.8092	-429.0331
		(993.261)	(368.989)	(3307.36)	
0.000000	1.000000	-19.25171	-8.029646	60.37724	-83.13032
		(176.028)	(65.3930)	(586.138)	

Log likelihood 981.6629

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

Z2	IN3	CL2	EX2	FF2	C
1.000000	0.000000	0.000000	-4.933221	-5.873461	2.974260
			(3.31276)	(5.30921)	
0.000000	1.000000	0.000000	-1.570053	-4.829473	-3.030335
			(0.79913)	(1.28073)	
0.000000	0.000000	1.000000	0.335533	-3.387061	4.160668
			(0.37504)	(0.60106)	

Log likelihood 989.5961

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

Z2	IN3	CL2	EX2	FF2	C
1.000000	0.000000	0.000000	0.000000	0.559437	3.983127
				(1.12573)	
0.000000	1.000000	0.000000	0.000000	-2.782131	-2.709252
				(0.40611)	
0.000000	0.000000	1.000000	0.000000	-3.824595	4.092050
				(0.26992)	
0.000000	0.000000	0.000000	1.000000	1.303996	0.204505
				(0.41964)	

Log likelihood 992.7569

Z2	IN3	CL2	EX2	FF2
-4.294315	4.134701	-2.110521	-0.889773	0.518241
-4.186688	4.197203	-2.188420	-0.826254	0.530508
-3.769440	4.484399	-1.539883	-0.696235	0.693911
-5.074953	3.495898	-2.702008	-1.360263	0.315941
0.335416	0.238181	0.328871	0.196101	0.082840
-0.656456	-0.837401	0.369586	-0.818772	-0.260321
2.407571	2.927661	2.096491	2.155148	2.656028
6.915697	9.367325	4.542348	11.31776	1.297947
0.031497	0.009245	0.103191	0.003486	0.522582
80	80	80	80	80

3. UK to France
Date: 03/22/98 Time: 17:11
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: Z3 IN21 CL3 EX3 FF3
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.440602	82.08330	68.52	76.07	None **
0.233625	38.51630	47.21	54.46	At most 1
0.132044	18.56006	29.68	35.65	At most 2
0.089087	7.939008	15.41	20.04	At most 3
0.012468	0.940955	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

Z3	IN21	CL3	EX3	FF3
0.859353	-5.430114	0.966356	3.604984	3.273167
0.350971	2.851653	2.547891	0.115930	-1.842169
0.371176	0.396995	0.113233	0.017684	-7.570340
-0.139841	0.379602	-0.473656	-0.064480	20.69763
2.044154	2.019814	4.814426	-0.069087	-59.87412

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

Z3	IN21	CL3	EX3	FF3	C
1.000000	-6.318838	1.124516	4.194996	3.808873	37.87780
	(2.42516)	(0.50574)	(1.34746)	(10.8329)	

Log likelihood 1115.252

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

Z3	IN21	CL3	EX3	FF3	C
1.000000	0.000000	3.808442	2.504294	-0.153626	13.10389
		(1.12493)	(1.29799)	(17.1008)	
0.000000	1.000000	0.424750	-0.267565	-0.627093	-3.920643
		(0.17460)	(0.20146)	(2.65424)	

Log likelihood 1125.230

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

Z3	IN21	CL3	EX3	FF3	C
1.000000	0.000000	0.000000	0.415662	-18.98690	4.638182
			(1.98727)	(34.4306)	
0.000000	1.000000	0.000000	-0.500507	-2.727540	-4.864811
			(0.22754)	(3.94232)	
0.000000	0.000000	1.000000	0.548422	4.945137	2.222879
			(0.56010)	(9.70413)	

Log likelihood 1130.541

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

Z3	IN21	CL3	EX3	FF3	C
1.000000	0.000000	0.000000	0.000000	-39.06693	3.510434
				(72.1544)	
0.000000	1.000000	0.000000	0.000000	21.45126	-3.506865
				(35.4549)	
0.000000	0.000000	1.000000	0.000000	-21.54833	0.734935
				(41.1325)	
0.000000	0.000000	0.000000	1.000000	48.30857	2.713138
				(70.1294)	

Log likelihood 1134.040

Z3	IN21	CL3	EX3	FF3
-4.029963	3.770214	-0.987366	-2.111157	-0.012466
-3.952917	3.786092	-1.040406	-2.065692	-0.013047
-3.376041	4.015968	-0.546967	-1.666220	0.014653
-5.031499	3.341498	-1.326240	-2.950179	-0.036493
0.383504	0.160939	0.197586	0.297927	0.011459
-0.761407	-0.502361	0.429730	-0.792884	0.056112

2.920998	2.438020	2.285233	3.162447	2.543674
7.750690	4.417624	4.165214	8.470165	0.736093
0.020747	0.109831	0.124605	0.014479	0.692085
80	80	80	80	80

4. Canada to Austria
Date: 03/22/98 Time: 17:13
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: Z4 IN15 CL4 EX4 FF4
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.507621	111.3205	68.52	76.07	None **
0.276560	58.18243	47.21	54.46	At most 1 **
0.198650	33.90207	29.68	35.65	At most 2 *
0.156778	17.29274	15.41	20.04	At most 3 *
0.058278	4.503392	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 5 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

Z4	IN15	CL4	EX4	FF4
-0.182638	1.902960	-2.162808	-0.671493	12.25058
0.286596	-0.550349	1.215257	1.766229	-21.81810
-1.236879	2.777701	-1.868347	-0.857924	-0.169933
-0.002248	0.125946	0.625190	0.489127	2.894414
0.327193	0.768567	0.363350	-0.003472	-3.574484

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

Z4	IN15	CL4	EX4	FF4	C
1.000000	-10.41931	11.84206	3.676634	-67.07578	75.63790
	(6.97844)	(8.37253)	(2.47694)	(53.0665)	

Log likelihood 1077.189

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

Z4	IN15	CL4	EX4	FF4	C
1.000000	0.000000	2.522754	6.724519	-78.17389	35.52397
		(3.09569)	(5.75287)	(78.4222)	
0.000000	1.000000	-0.894426	0.292523	-1.065149	-3.849961
		(0.40472)	(0.75211)	(10.2526)	

Log likelihood 1089.329

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

Z4	IN15	CL4	EX4	FF4	C
1.000000	0.000000	0.000000	2.236662	-14.77297	13.84348
			(1.05014)	(12.6876)	
0.000000	1.000000	0.000000	1.883664	-23.54354	3.836718
			(0.81608)	(9.85967)	
0.000000	0.000000	1.000000	1.778952	-25.13163	8.593976
			(0.64048)	(7.73811)	

Log likelihood 1097.634

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

Z4	IN15	CL4	EX4	FF4	C
1.000000	0.000000	0.000000	0.000000	41.55351	-0.099394
				(33.4754)	
0.000000	1.000000	0.000000	0.000000	23.89330	-7.905643
				(25.7501)	
0.000000	0.000000	1.000000	0.000000	19.66821	-2.495630
				(24.5101)	
0.000000	0.000000	0.000000	1.000000	-25.18328	6.233787
				(15.8233)	

Log likelihood 1104.028

	Z4	IN15	CL4	EX4	FF4
Mean	-6.205503	4.289555	-0.462716	-2.434429	0.152192
Median	-6.201164	4.283758	-0.540085	-2.415029	0.152536
Maximum	-5.782620	4.462710	0.040018	-1.939456	0.180641
Minimum	-6.795850	4.158042	-0.676439	-2.944254	0.111549
Std. Dev.	0.236725	0.090719	0.190988	0.241355	0.015214
Skewness	-0.204450	0.429734	1.189426	-0.061997	-0.316832
Kurtosis	2.034879	1.906511	3.377688	2.228754	2.620210
Jarque-Bera	3.662192	6.448007	19.33862	2.033980	1.819235
Probability	0.160238	0.039795	0.000063	0.361682	0.402678
Observations	80	80	80	80	80

Specification error was found. We tried again with lower lag values.
Date: 03/24/98 Time: 09:15
Sample: 1976:1 1995:4
Included observations: 78
Test assumption: Linear deterministic trend in the data
Series: Z4 IN15 CL4 EX4 FF4
Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.372415	90.33797	68.52	76.07	None **
0.272709	53.99966	47.21	54.46	At most 1 *
0.258144	29.16220	29.68	35.65	At most 2
0.044748	5.871392	15.41	20.04	At most 3
0.029064	2.300553	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

Z4	IN15	CL4	EX4	FF4
-0.166834	0.792235	-1.028163	-0.682786	10.84570
-0.620666	1.355835	-0.951450	-0.082953	-5.350515
0.445015	-0.499824	0.506068	0.777897	-4.723409
0.118072	-0.929686	-0.402482	-0.443025	2.574756
-0.216832	-0.772277	0.183913	0.234283	2.688797

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

Z4	IN15	CL4	EX4	FF4	C
1.000000	-4.748638	6.162787	4.092602	-65.00891	49.27897
	(2.57149)	(3.61625)	(2.67846)	(47.5233)	

Log likelihood 1043.070

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

Z4	IN15	CL4	EX4	FF4	C
1.000000	0.000000	-2.411358	-3.239105	71.34799	-13.64092
		(2.40936)	(2.48053)	(47.0487)	
0.000000	1.000000	-1.805601	-1.543960	28.71495	-13.25009
		(0.93811)	(0.96583)	(18.3190)	

Log likelihood 1055.489

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

Z4	IN15	CL4	EX4	FF4	C
1.000000	0.000000	0.000000	1.919609	-7.484224	12.01164
			(2.22684)	(29.4911)	
0.000000	1.000000	0.000000	2.318834	-30.31383	5.958287
			(2.01338)	(26.6641)	
0.000000	0.000000	1.000000	2.139340	-32.69204	10.63822
			(1.44339)	(19.1156)	

Log likelihood 1067.134

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

Z4	IN15	CL4	EX4	FF4	C
1.000000	0.000000	0.000000	0.000000	23.49726	2.634465
				(10.9971)	
0.000000	1.000000	0.000000	0.000000	7.110939	-5.369072
				(8.89659)	
0.000000	0.000000	1.000000	0.000000	1.835785	0.187678
				(8.88254)	
0.000000	0.000000	0.000000	1.000000	-16.13948	4.884937
				(6.29161)	

Log likelihood 1068.919

---

5. Netherlands to Austria
Date: 03/22/98 Time: 17:17
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: Z5 IN9 CL5 EX5 FF5
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.594713	118.2957	68.52	76.07	None **
0.297087	50.55859	47.21	54.46	At most 1 *
0.218573	24.11939	29.68	35.65	At most 2
0.072198	5.621856	15.41	20.04	At most 3
2.17E-05	0.001624	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

Z5	IN9	CL5	EX5	FF5
-0.172293	3.776872	-4.538951	-1.587843	3.690306
-1.015229	-1.000807	2.763195	0.420904	-13.28078
1.788232	-0.617163	-1.356220	-8.657793	14.89197
-0.542931	-0.137755	-1.044578	2.568042	7.248512
0.670340	0.336259	0.569806	1.001475	-8.055393

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

Z5	IN9	CL5	EX5	FF5	C
1.000000	-21.92120	26.34435	9.215940	-21.41876	140.4412
	(27.1061)	(33.5969)	(15.7620)	(35.4918)	

Log likelihood 1076.503

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

Z5	IN9	CL5	EX5	FF5	C
1.000000	0.000000	-1.470896	-0.000144	11.59684	1.039413
		(0.48553)	(1.57839)	(3.70549)	
0.000000	1.000000	-1.268874	-0.420419	1.506104	-6.359225
		(0.07273)	(0.23644)	(0.55506)	

Log likelihood 1089.723

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

Z5	IN9	CL5	EX5	FF5	C
1.000000	0.000000	0.000000	-26.71395	-3.131754	-45.36382
			(49.4745)	(7.20720)	
0.000000	1.000000	0.000000	-23.46520	-11.19958	-46.38917
			(48.3024)	(7.03645)	
0.000000	0.000000	1.000000	-18.16159	-10.01335	-31.54760
			(38.1463)	(5.55695)	

Log likelihood 1098.971

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

Z5	IN9	CL5	EX5	FF5	C
1.000000	0.000000	0.000000	0.000000	1.918738	3.074331
				(1.28295)	
0.000000	1.000000	0.000000	0.000000	-6.763294	-3.841710
				(1.01797)	
0.000000	0.000000	1.000000	0.000000	-6.579754	1.383277
				(0.78113)	
0.000000	0.000000	0.000000	1.000000	0.189058	1.813215
				(0.15515)	

Log likelihood 1101.782

	Z5	IN9	CL5	EX5	FF5
Mean	-3.452027	5.079501	-0.176724	-1.851727	0.184258
Median	-3.394292	5.054037	-0.185380	-1.837703	0.180104
Maximum	-3.097589	6.140285	0.814462	-1.818121	0.349681
Minimum	-4.435246	4.078229	-1.119761	-1.922438	0.072686
Std. Dev.	0.248497	0.576771	0.542387	0.028808	0.076790
Skewness	-1.381512	0.008055	0.052127	-1.222372	0.367236
Kurtosis	5.606216	1.779490	1.772961	3.048189	1.986864
Jarque-Bera	48.08890	4.966351	5.054981	19.93032	5.219643
Probability	0.000000	0.083478	0.079859	0.000047	0.073548
Observations	80	80	80	80	80

6. USA to Austria
Date: 03/22/98 Time: 17:19
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: Z6 IN20 CL6 EX6 FF6

Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.406901	105.0929	68.52	76.07	None **
0.333932	65.91328	47.21	54.46	At most 1 **
0.246702	35.43606	29.68	35.65	At most 2 *
0.146413	14.18899	15.41	20.04	At most 3
0.030407	2.315914	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 3 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

Z6	IN20	CL6	EX6	FF6
1.190823	-2.325875	-2.792421	-0.391520	32.57804
0.556113	3.501521	1.124229	-1.299557	11.70980
0.184218	-2.630203	4.041867	2.385207	-20.63914
0.025420	0.966328	2.176964	1.413679	-21.17668
0.165055	-2.245412	1.741889	1.607591	-24.14834

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

Z6	IN20	CL6	EX6	FF6	C
1.000000	-1.953167	-2.344952	-0.328781	27.35760	6.552296
	(0.65110)	(0.69699)	(0.40576)	(5.19829)	

Log likelihood 1234.605

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

Z6	IN20	CL6	EX6	FF6	C
1.000000	0.000000	-1.311134	-0.804212	25.86576	-2.810854
		(0.75907)	(0.31594)	(5.19099)	
0.000000	1.000000	0.529304	-0.243416	-0.763806	-4.793830
		(0.25676)	(0.10687)	(1.75586)	

Log likelihood 1249.843

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

Z6	IN20	CL6	EX6	FF6	C
1.000000	0.000000	0.000000	-0.366875	19.53298	-0.239447
			(0.13999)	(2.48347)	
0.000000	1.000000	0.000000	-0.419968	1.792729	-5.831905
			(0.03890)	(0.69003)	
0.000000	0.000000	1.000000	0.333556	-4.829998	1.961208
			(0.04387)	(0.77816)	

Log likelihood 1260.467

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

Z6	IN20	CL6	EX6	FF6	C
1.000000	0.000000	0.000000	0.000000	15.24409	1.462256
				(1.93568)	
0.000000	1.000000	0.000000	0.000000	-3.116842	-3.883936
				(1.51359)	
0.000000	0.000000	1.000000	0.000000	-0.930609	0.414049
				(1.41331)	
0.000000	0.000000	0.000000	1.000000	-11.69034	4.638372

(3.51879)

Log likelihood 1266.403

	Z6	IN20	CL6	EX6	FF6
Mean	-4.091202	4.416806	-0.242652	-2.637277	0.172562
Median	-4.114552	4.414366	-0.265689	-2.602662	0.174310
Maximum	-3.502582	4.572115	0.004984	-2.275214	0.195611
Minimum	-4.591491	4.286090	-0.359042	-3.095577	0.144091
Std. Dev.	0.259691	0.080608	0.104682	0.212879	0.012192
Skewness	0.353432	0.219007	1.034836	-0.299216	-0.481568
Kurtosis	2.417588	1.966127	2.899209	2.103850	2.484059
Jarque-Bera	2.796197	4.202503	14.31232	3.870690	3.979424
Probability	0.247066	0.122303	0.000780	0.144374	0.136735
Observations	80	80	80	80	80

7. Turkey to Austria
Date: 03/22/98 Time: 17:21
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: Z7 IN12 CL7 EX7 FF7
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.356912	79.65399	68.52	76.07	None **
0.242650	46.54341	47.21	54.46	At most 1
0.181847	25.69872	29.68	35.65	At most 2
0.114297	10.64581	15.41	20.04	At most 3
0.020361	1.542801	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

Z7	IN12	CL7	EX7	FF7
0.115805	0.856483	-0.890485	-0.620340	5.868037
-0.465309	0.846552	-0.081448	0.456284	-4.759426
-0.094615	-0.036228	-0.283147	-0.855171	-9.025674
-0.118757	0.737661	-0.919086	-1.227251	-3.961118
-0.345624	-0.456123	0.184831	0.285363	9.673505

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

Z7	IN12	CL7	EX7	FF7	C
1.000000	7.395903	-7.689512	-5.356757	50.67165	-37.11744
	(6.80475)	(6.54124)	(4.62218)	(44.7003)	

Log likelihood 869.1106

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

Z7	IN12	CL7	EX7	FF7	C
1.000000	0.000000	-1.377634	-1.844574	18.21309	1.877517
		(0.40950)	(0.71236)	(8.79314)	
0.000000	1.000000	-0.853429	-0.474882	4.388722	-5.272508
		(0.14223)	(0.24742)	(3.05406)	

Log likelihood 879.5329

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

Z7	IN12	CL7	EX7	FF7	C
1.000000	0.000000	0.000000	1.400732	40.35725	4.873405
			(0.84710)	(23.7357)	
0.000000	1.000000	0.000000	1.535550	18.10679	-3.416588
			(0.50754)	(14.2212)	
0.000000	0.000000	1.000000	2.355710	16.07406	2.174662
			(0.57937)	(16.2339)	

Log likelihood 887.0594

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

Z7	IN12	CL7	EX7	FF7	C
1.000000	0.000000	0.000000	0.000000	150.7817	19.07438
				(2344.65)	
0.000000	1.000000	0.000000	0.000000	139.1594	12.15121
				(2544.04)	
0.000000	0.000000	1.000000	0.000000	201.7828	26.05746
				(3898.11)	
0.000000	0.000000	0.000000	1.000000	-78.83343	-10.13826
				(1638.91)	

Log likelihood 891.6109

3.2 MALTA INBOUNDS

8. Austria to Malta
Date: 03/22/98 Time: 17:23
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: W1 IN14 CL8 EX8 FF8
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.192885	46.38104	68.52	76.07	None
0.162571	30.30938	47.21	54.46	At most 1
0.123194	17.00298	29.68	35.65	At most 2
0.077622	7.142779	15.41	20.04	At most 3
0.014333	1.082775	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. rejects any cointegration at 5% significance level

Unnormalized Cointegrating Coefficients:

W1	IN14	CL8	EX8	FF8
-0.334651	1.162497	-2.469340	-1.414985	9.874400
-0.148303	1.244483	-1.851261	0.314785	-3.400543
0.511990	-2.015219	-2.917059	-3.328396	12.49053
0.115830	-0.653150	-0.392427	-0.653536	-5.384340
-0.088900	1.450383	0.187676	1.141296	0.165452

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

W1	IN14	CL8	EX8	FF8	C
1.000000	-3.473754	7.378843	4.228237	-29.50653	43.57935
	(0.98664)	(4.87286)	(4.15605)	(20.3591)	

Log likelihood 958.7845

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

W1	IN14	CL8	EX8	FF8	C
1.000000	0.000000	3.773431	8.714279	-66.54604	24.80601
		(12.8123)	(9.11002)	(47.3318)	
0.000000	1.000000	-1.037901	1.291410	-10.66267	-5.404338
		(2.85813)	(2.03224)	(10.5587)	

Log likelihood 965.4377

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

W1	IN14	CL8	EX8	FF8	C
1.000000	0.000000	0.000000	5.893948	-52.91408	14.85197
			(2.49885)	(32.8841)	
0.000000	1.000000	0.000000	2.067156	-14.41221	-2.666431
			(0.60067)	(7.90461)	
0.000000	0.000000	1.000000	0.747418	-3.612617	2.637928
			(0.09920)	(1.30544)	

Log likelihood 970.3678

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

W1	IN14	CL8	EX8	FF8	C
1.000000	0.000000	0.000000	0.000000	140.5780	-44.98274
				(244.037)	
0.000000	1.000000	0.000000	0.000000	53.45032	-23.65197
				(84.9367)	
0.000000	0.000000	1.000000	0.000000	20.92433	-4.949779
				(31.1105)	
0.000000	0.000000	0.000000	1.000000	-32.82894	10.15189
				(41.8690)	

Log likelihood 973.3978

	W1	IN14	CL8	EX8	FF8
Mean	-5.581966	4.426868	-2.582430	1.659759	0.359753
Median	-5.765584	4.456766	-2.544094	1.582500	0.363524
Maximum	-3.696491	4.994993	-2.252832	2.385918	0.404124
Minimum	-7.431770	3.811808	-3.018224	1.098289	0.317371
Std. Dev.	0.764238	0.325199	0.193063	0.324706	0.020349
Skewness	0.198967	0.029289	-0.556442	0.397361	-0.486561
Kurtosis	2.739767	1.762336	2.490755	2.147467	2.461985
Jarque-Bera	0.753573	5.117481	4.992809	4.527980	4.121423
Probability	0.686063	0.077402	0.082381	0.103935	0.127363
Observations	80	80	80	80	80

9. Denmark to Malta
Date: 03/22/98 Time: 17:25
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: W2 IN2 CL9 EX9 FF9
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.307190	77.24855	68.52	76.07	None **
0.261975	49.72358	47.21	54.46	At most 1 *
0.163518	26.94024	29.68	35.65	At most 2
0.115073	13.54897	15.41	20.04	At most 3
0.056730	4.380209	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

W2	IN2	CL9	EX9	FF9
0.103996	-1.188007	-0.629476	-1.445419	5.063521
-0.380874	0.069617	5.128297	4.375900	-18.32891
-0.108247	-0.042302	-2.158723	-1.297597	6.675969
-0.005493	1.638874	0.606018	1.273019	-0.989644
-0.322422	-1.146873	-0.452961	-1.111544	-1.088838

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

W2	IN2	CL9	EX9	FF9	C
1.000000	-11.42358	-6.052890	-13.89879	48.68957	37.69034
	(11.2821)	(7.82055)	(10.7297)	(31.4939)	

Log likelihood 886.7415

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

W2	IN2	CL9	EX9	FF9	C
1.000000	0.000000	-13.58505	-11.44990	48.11402	-30.33449
		(3.55817)	(2.73514)	(9.66001)	
0.000000	1.000000	-0.659352	0.214371	-0.050382	-5.954773
		(1.06568)	(0.81918)	(2.89319)	

Log likelihood 898.1332

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

W2	IN2	CL9	EX9	FF9	C
1.000000	0.000000	0.000000	-2.059466	3.976422	5.368423
			(0.75134)	(6.05388)	
0.000000	1.000000	0.000000	0.670137	-2.192606	-4.221928
			(0.11679)	(0.94100)	
0.000000	0.000000	1.000000	0.691233	-3.248983	2.628103
			(0.05412)	(0.43605)	

Log likelihood 904.8288

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

W2	IN2	CL9	EX9	FF9	C
1.000000	0.000000	0.000000	0.000000	-33.06321	15.29236
				(61.7505)	
0.000000	1.000000	0.000000	0.000000	9.859856	-7.451115
				(16.3397)	
0.000000	0.000000	1.000000	0.000000	9.182889	-0.702739
				(18.1863)	
0.000000	0.000000	0.000000	1.000000	-17.98506	4.818695
				(26.6443)	

Log likelihood 909.4132

	W2	IN2	CL9	EX9	FF9
Mean	-4.770726	4.297727	-2.219948	0.943263	0.327531
Median	-4.548055	4.386585	-2.288609	0.898849	0.320275
Maximum	-4.219759	4.705138	-1.768931	1.715143	0.473514
Minimum	-6.910392	3.758088	-2.745776	0.504024	0.242150
Std. Dev.	0.614159	0.236119	0.266830	0.299352	0.063576
Skewness	-1.843432	-0.608858	0.171751	0.910681	0.490231

Kurtosis	5.316225	2.489880	2.139772	3.021690	2.375453
Jarque-Bera	63.19287	5.810174	2.859954	11.05943	4.504542
Probability	0.000000	0.054744	0.239314	0.003967	0.105160
Observations	80	80	80	80	80

10. Germany to Malta
Date: 03/22/98 Time: 17:28
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: W3 IN4 CL10 EX10 FF10
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.448624	75.59059	68.52	76.07	None *
0.212375	30.94023	47.21	54.46	At most 1
0.102586	13.03526	29.68	35.65	At most 2
0.050956	4.917431	15.41	20.04	At most 3
0.013178	0.994919	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

W3	IN4	CL10	EX10	FF10
-0.605877	5.904268	-0.899877	3.715059	2.131462
-0.272403	0.691809	1.251005	0.703333	-0.181946
-0.051037	-0.583446	-2.385355	-2.153390	7.791428
-0.022511	1.125971	-1.472579	-0.191051	-2.724438
0.032565	0.126029	0.094982	-0.048442	5.697230

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

W3	IN4	CL10	EX10	FF10	C
1.000000	-9.744997	1.485247	-6.131707	-3.517979	49.28917
	(0.51922)	(0.67308)	(0.56492)	(2.12210)	

Log likelihood 938.5600

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

W3	IN4	CL10	EX10	FF10	C
1.000000	0.000000	-6.734686	-1.330789	2.143328	-1.497044
		(3.67141)	(2.30691)	(11.5970)	
0.000000	1.000000	-0.843503	0.492655	0.580945	-5.211516
		(0.38828)	(0.24397)	(1.22648)	

Log likelihood 947.5125

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

W3	IN4	CL10	EX10	FF10	C
1.000000	0.000000	0.000000	2.712415	-15.08379	9.887909
			(0.54301)	(9.24682)	
0.000000	1.000000	0.000000	0.999056	-1.576710	-3.785579
			(0.06029)	(1.02675)	
0.000000	0.000000	1.000000	0.600355	-2.557969	1.690495
			(0.05524)	(0.94065)	

Log likelihood 951.5714

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

W3	IN4	CL10	EX10	FF10	C
1.000000	0.000000	0.000000	0.000000	-52.06172	23.27484
				(42.3847)	
0.000000	1.000000	0.000000	0.000000	-15.19669	1.145193
				(15.3732)	
0.000000	0.000000	1.000000	0.000000	-10.74252	4.653506
				(9.60871)	
0.000000	0.000000	0.000000	1.000000	13.63285	-4.935431
				(15.4314)	

Log likelihood 953.5326

	W3	IN4	CL10	EX10	FF10
Mean	-3.279016	4.687447	-0.535216	-0.297222	0.385072
Median	-3.310015	4.721710	-0.475074	-0.397364	0.383616
Maximum	-1.943008	5.212806	-0.167933	0.437742	0.427985
Minimum	-4.686759	4.147323	-0.981732	-0.851665	0.352410
Std. Dev.	0.869810	0.296816	0.218110	0.325202	0.018293
Skewness	0.042471	-0.138100	-0.437398	0.424410	0.703615
Kurtosis	1.504266	1.694946	2.209574	2.176041	2.694024
Jarque-Bera	7.481449	5.931506	4.633468	4.664676	6.913062
Probability	0.023737	0.051522	0.098595	0.097069	0.031539
Observations	80	80	80	80	80

11. Italy to Malta
Date: 03/22/98 Time: 17:30
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: W4 IN18 CL11 EX11 FF11
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.453543	111.3602	68.52	76.07	None **
0.374187	66.03777	47.21	54.46	At most 1 **
0.172990	30.88501	29.68	35.65	At most 2 *
0.157657	16.63958	15.41	20.04	At most 3 *
0.049049	3.771954	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 5 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

W4	IN18	CL11	EX11	FF11
0.239918	-3.497036	-1.143265	-1.039852	21.43368
0.198004	-3.220994	-0.046132	-3.754394	-14.52460
-0.522723	0.615543	-0.545078	-0.097653	0.131439
-0.498254	1.924084	0.480634	1.621992	-5.566196
-0.580033	2.208922	0.516940	0.988935	-7.719064

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

W4	IN18	CL11	EX11	FF11	C
1.000000	-14.57595	-4.765231	-4.334194	89.33747	41.94311
	(5.70630)	(2.28194)	(2.15163)	(43.2182)	

Log likelihood 992.7638

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

W4	IN18	CL11	EX11	FF11	C
1.000000	0.000000	-43.82325	121.7187	1491.392	-1081.472
		(273.380)	(748.170)	(9187.20)	
0.000000	1.000000	-2.679620	8.648003	96.18952	-77.07321
		(18.0406)	(49.3726)	(606.274)	

Log likelihood 1010.340

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

W4	IN18	CL11	EX11	FF11	C
1.000000	0.000000	0.000000	4.730564	43.20272	-25.14337
			(1.70439)	(13.9586)	
0.000000	1.000000	0.000000	1.494637	7.638450	-12.48282
			(0.20990)	(1.71907)	
0.000000	0.000000	1.000000	-2.669545	-33.04613	24.10431
			(0.54766)	(4.48521)	

Log likelihood 1017.463

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

W4	IN18	CL11	EX11	FF11	C
1.000000	0.000000	0.000000	0.000000	9.212897	3.742482
				(2.54095)	
0.000000	1.000000	0.000000	0.000000	-3.100743	-3.356246
				(0.89402)	
0.000000	0.000000	1.000000	0.000000	-13.86505	7.803483
				(1.72083)	
0.000000	0.000000	0.000000	1.000000	7.185152	-6.106218
				(0.65872)	

Log likelihood 1023.897

	W4	IN18	CL11	EX11	FF11
Mean	-3.676367	3.331906	-7.881633	6.159504	-0.005716
Median	-3.781117	3.383749	-8.129671	6.143287	-0.009833
Maximum	-2.588873	3.694353	-6.751862	6.862032	0.088356
Minimum	-4.351397	2.734264	-8.577067	5.622065	-0.101020
Std. Dev.	0.449909	0.228364	0.582071	0.314607	0.042840
Skewness	0.510161	-0.827989	0.682802	0.295258	0.091786
Kurtosis	2.236836	2.912429	1.900385	2.309883	2.489782
Jarque-Bera	5.411589	9.166444	10.24676	2.749898	0.980069
Probability	0.066817	0.010222	0.005956	0.252852	0.612605
Observations	80	80	80	80	80

Specification error was found. We tried again with lower lag values.
Date: 03/24/98 Time: 09:18
Sample: 1976:1 1995:4
Included observations: 78
Test assumption: Linear deterministic trend in the data
Series: W4 IN18 CL11 EX11 FF11
Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.408646	103.0583	68.52	76.07	None **
0.328668	62.08174	47.21	54.46	At most 1 **
0.219437	30.99938	29.68	35.65	At most 2 *
0.087753	11.67572	15.41	20.04	At most 3
0.056203	4.511819	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 3 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

W4	IN18	CL11	EX11	FF11
0.366831	-2.188593	-0.587827	-0.853778	11.60272
-0.060093	-0.842777	0.187353	-1.076102	-7.404515
-0.261473	1.404741	0.121229	1.992992	6.667604
0.418661	0.284742	0.611302	0.449812	-3.422960
-0.083880	0.728245	0.358729	0.045632	-4.429532

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

W4	IN18	CL11	EX11	FF11	C
1.000000	-5.966213	-1.602445	-2.327443	31.62959	25.45562
	(1.13002)	(0.49695)	(0.86651)	(8.58289)	

Log likelihood 951.5001

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

W4	IN18	CL11	EX11	FF11	C
1.000000	0.000000	-2.054673	3.711579	58.96385	-35.01236
		(1.30433)	(1.78412)	(28.2488)	
0.000000	1.000000	-0.075798	1.012204	4.581509	-10.13507
		(0.20994)	(0.28716)	(4.54673)	

Log likelihood 967.0413

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

W4	IN18	CL11	EX11	FF11	C
1.000000	0.000000	0.000000	-6.521363	-44.91458	43.57005
			(9.80603)	(75.5939)	
0.000000	1.000000	0.000000	0.634704	0.749373	-7.236118
			(0.88939)	(6.85624)	
0.000000	0.000000	1.000000	-4.980327	-50.55717	38.24571
			(4.61785)	(35.5986)	

Log likelihood 976.7031

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

W4	IN18	CL11	EX11	FF11	C
1.000000	0.000000	0.000000	0.000000	4.799260	3.712425
				(1.93673)	
0.000000	1.000000	0.000000	0.000000	-4.089124	-3.356897
				(0.75428)	
0.000000	0.000000	1.000000	0.000000	-12.59099	7.806667
				(1.40227)	
0.000000	0.000000	0.000000	1.000000	7.623229	-6.111856
				(0.60911)	

Log likelihood 980.2851

12. Libya to Malta
Date: 03/22/98 Time: 17:31
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: W5 IN7 CL12 EX12
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.255073	54.14404	47.21	54.46	None *
0.226122	32.05883	29.68	35.65	At most 1 *
0.147379	12.83323	15.41	20.04	At most 2
0.011602	0.875230	3.76	6.65	At most 3

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

W5	IN7	CL12	EX12
0.208060	-0.556289	-0.273724	0.987109
-0.314887	-0.493439	-0.113796	-1.135373
0.276309	-0.038140	-1.066255	-0.408941
-0.042269	-0.409037	0.257907	-0.928118

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

W5	IN7	CL12	EX12	C
1.000000	-2.673699	-1.315604	4.744357	32.16836
	(1.51351)	(0.85549)	(1.80347)	

Log likelihood 569.0662

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

W5	IN7	CL12	EX12	C
1.000000	0.000000	-0.258295	4.026425	4.167613
		(0.58704)	(0.97345)	
0.000000	1.000000	0.395448	-0.268516	-10.47266
		(0.29192)	(0.48407)	

Log likelihood 578.6790

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

W5	IN7	CL12	EX12	C
1.000000	0.000000	0.000000	4.430214	3.071420
			(0.90091)	
0.000000	1.000000	0.000000	-0.886717	-8.794393
			(0.46825)	
0.000000	0.000000	1.000000	1.563291	-4.243968
			(0.48824)	

Log likelihood 584.6580

	W5	IN7	CL12	EX12
Mean	-4.103694	8.979877	3.870519	0.230701
Median	-4.087475	8.932111	3.909952	0.192748
Maximum	-3.073526	9.450492	4.321748	0.507565
Minimum	-5.213132	8.284081	3.389736	-0.002223
Std. Dev.	0.570925	0.232824	0.219508	0.121931
Skewness	-0.106314	0.026200	-0.492900	0.376581
Kurtosis	1.959102	2.806595	3.006538	2.307975
Jarque-Bera	3.762267	0.133837	3.239478	3.487176
Probability	0.152417	0.935271	0.197950	0.174892
Observations	80	80	80	80

13. UK to Malta
Date: 03/22/98 Time: 17:33
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: W6 IN21 CL13 EX13 FF13

Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.374976	81.44368	68.52	76.07	None **
0.237894	46.19633	47.21	54.46	At most 1
0.151444	25.82111	29.68	35.65	At most 2
0.092064	13.50463	15.41	20.04	At most 3
0.080091	6.261038	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

W6	IN21	CL13	EX13	FF13
1.339675	-2.568213	-0.094574	0.347836	0.587105
-0.177418	-1.801755	-0.373734	0.052809	-4.701297
-0.391634	-1.577215	-2.965347	1.884563	3.955551
0.275186	-1.398910	-0.053821	-0.679577	-5.594407
-0.357643	0.989775	0.331675	-1.052123	1.898471

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

W6	IN21	CL13	EX13	FF13	C
1.000000	-1.917042	-0.070595	0.259642	0.438244	8.637837
	(0.36670)	(0.33757)	(0.25953)	(0.96561)	

Log likelihood 1006.874

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

W6	IN21	CL13	EX13	FF13	C
1.000000	0.000000	0.275118	0.171147	4.576458	1.742838
		(0.53661)	(0.46586)	(2.07756)	
0.000000	1.000000	0.180337	-0.046162	2.158645	-3.596686
		(0.25089)	(0.21781)	(0.97137)	

Log likelihood 1017.062

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

W6	IN21	CL13	EX13	FF13	C
1.000000	0.000000	0.000000	0.372023	5.555025	1.588430
			(0.24005)	(0.95029)	
0.000000	1.000000	0.000000	0.085509	2.800084	-3.697898
			(0.11816)	(0.46777)	
0.000000	0.000000	1.000000	-0.730143	-3.556893	0.561241
			(0.14265)	(0.56469)	

Log likelihood 1023.220

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

W6	IN21	CL13	EX13	FF13	C
1.000000	0.000000	0.000000	0.000000	3.753609	1.391985
				(1.99510)	
0.000000	1.000000	0.000000	0.000000	2.386030	-3.743051
				(0.79924)	
0.000000	0.000000	1.000000	0.000000	-0.021383	0.946791
				(2.62249)	
0.000000	0.000000	0.000000	1.000000	4.842219	0.528047

				(3.21297)	

Log likelihood 1026.842

	W6	IN21	CL13	EX13	FF13
Mean	-1.364762	3.770214	-0.932519	-0.451397	-0.014574
Median	-1.259030	3.786092	-0.961623	-0.510030	-0.025396
Maximum	-0.578965	4.015968	-0.519585	-0.168849	0.108559
Minimum	-2.028443	3.341498	-1.327517	-0.617126	-0.064626
Std. Dev.	0.331872	0.160939	0.206268	0.134168	0.038120
Skewness	-0.377531	-0.502361	0.098092	0.556498	1.240161
Kurtosis	2.215353	2.438020	1.905282	1.789037	4.004733
Jarque-Bera	3.952635	4.417624	4.122987	9.017299	23.87161
Probability	0.138579	0.109831	0.127264	0.011013	0.000007
Observations	80	80	80	80	80

14. USA to Malta
Date: 03/22/98 Time: 17:35
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: W7 IN20 CL14 FF14
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.299842	47.36855	47.21	54.46	None *
0.164516	20.63488	29.68	35.65	At most 1
0.053244	7.154068	15.41	20.04	At most 2
0.039858	3.050551	3.76	6.65	At most 3

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

W7	IN20	CL14	FF14
0.396508	-0.757909	-0.281666	8.084140
0.396557	1.280688	1.607355	-6.460149
-0.355063	1.791822	1.644522	0.816882
0.332785	-5.407210	-1.760414	-10.35272

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

W7	IN20	CL14	FF14	C
1.000000	-1.911460	-0.710367	20.38834	14.66231
	(2.36144)	(1.24520)	(10.6260)	

Log likelihood 986.6709

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

W7	IN20	CL14	FF14	C
1.000000	0.000000	1.060797	6.750798	5.767254
		(1.08319)	(19.8953)	
0.000000	1.000000	0.926603	-7.134623	-4.653541
		(0.45022)	(8.26938)	

Log likelihood 993.4113

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

W7	IN20	CL14	FF14	C
1.000000	0.000000	0.000000	-40.27628	2.830468
			(295.426)	
0.000000	1.000000	0.000000	-48.21261	-7.218813
			(275.491)	

0.000000	0.000000	1.000000	44.33183 (282.409)	2.768471

Log likelihood 995.4631

	W7	IN20	CL14	FF14
Mean	-5.156060	4.416806	-0.187806	-0.055020
Median	-5.105443	4.414366	-0.211341	-0.059265
Maximum	-4.417805	4.572115	-0.002540	0.008944
Minimum	-5.749453	4.286090	-0.358213	-0.093492
Std. Dev.	0.313568	0.080608	0.124970	0.018749
Skewness	0.126961	0.219007	0.097557	1.667479
Kurtosis	2.263112	1.966127	1.371847	6.307923
Jarque-Bera	2.024935	4.202503	8.963173	73.54768
Probability	0.363321	0.122303	0.011315	0.000000
Observations	80	80	80	80

3.4 NORTH CYPRUS INBOUND

15. Turkey to N. Cyprus (86-95 period only)
Date: 03/22/98 Time: 17:37
Sample: 1976:1 1995:4
Included observations: 47
Test assumption: Linear deterministic trend in the data
Series: P1 IN12 CL15 EX15 FF20
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.733273	124.6081	68.52	76.07	None **
0.489857	62.49623	47.21	54.46	At most 1 **
0.324967	30.86219	29.68	35.65	At most 2 *
0.203891	12.39148	15.41	20.04	At most 3
0.035002	1.674587	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 3 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

P1	IN12	CL15	EX15	FF20
0.594824	0.340429	-0.408870	-0.479816	38.65089
0.063600	-1.581178	-0.112821	-1.589864	-8.163235
-0.206221	8.207398	-0.571027	7.108437	60.32437
0.519430	1.589524	0.469422	2.326863	-1.380746
-0.302946	-0.233862	0.330765	0.567670	19.43100

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

P1	IN12	CL15	EX15	FF20	C
1.000000	0.572319 (1.26885)	-0.687381 (0.16275)	-0.806653 (1.12834)	64.97873 (13.5154)	6.776409

Log likelihood 597.1586

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

P1	IN12	CL15	EX15	FF20	C
1.000000	0.000000	-0.711830 (0.20366)	-1.351014 (0.28369)	60.62829 (9.35444)	9.126230
0.000000	1.000000	0.042720 (0.12205)	0.951151 (0.17001)	7.601436 (5.60585)	-4.105790

Log likelihood 612.9757

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

P1	IN12	CL15	EX15	FF20	C
1.000000	0.000000	0.000000	-0.700342	53.67335	11.53988
			(0.43029)	(27.8814)	
0.000000	1.000000	0.000000	0.912101	8.018832	-4.250644
			(0.05312)	(3.44189)	
0.000000	0.000000	1.000000	0.914084	-9.770501	3.390768
			(0.63543)	(41.1741)	

Log likelihood 622.2110

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

P1	IN12	CL15	EX15	FF20	C
1.000000	0.000000	0.000000	0.000000	21.38885	3.990173
				(15.2068)	
0.000000	1.000000	0.000000	0.000000	50.06504	5.581832
				(47.7970)	
0.000000	0.000000	1.000000	0.000000	32.36709	13.24461
				(82.7177)	
0.000000	0.000000	0.000000	1.000000	-46.09818	-10.78003
				(49.2438)	

Log likelihood 627.5695

	P1	IN12	CL15	EX15	FF20
Mean	-2.686810	-1.050857	-9.104859	6.418490	-0.055020
Median	-2.640744	-1.030285	-8.974972	6.428573	-0.059265
Maximum	-2.009978	2.716432	-1.903936	10.99625	0.008944
Minimum	-3.557052	-5.533273	-17.10583	2.750790	-0.093492
Std. Dev.	0.410742	2.294698	4.204715	2.381954	0.018749
Skewness	-0.361374	-0.127529	-0.065741	0.124714	1.667479
Kurtosis	2.231187	2.078545	2.069562	2.005496	6.307923
Jarque-Bera	2.412449	3.047116	2.649008	3.504176	73.54768
Probability	0.299325	0.217935	0.265935	0.173411	0.000000
Observations	52	80	72	80	80

16. UK to N. Cyprus
Date: 03/22/98 Time: 17:39
Sample: 1976:1 1995:4
Included observations: 47
Test assumption: Linear deterministic trend in the data
Series: P2 IN21 CL16 EX16
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.364066	43.41138	47.21	54.46	None
0.214295	22.13633	29.68	35.65	At most 1
0.131577	10.80115	15.41	20.04	At most 2
0.084912	4.170571	3.76	6.65	At most 3 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. rejects any cointegration at 5% significance level

Unnormalized Cointegrating Coefficients:

P2	IN21	CL16	EX16
1.091155	-2.375124	-1.160888	0.163706
-0.834128	0.900855	-0.130742	-0.174175
0.504180	0.186309	0.075015	0.306532
-0.219102	-0.628692	0.196899	-0.056283

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

P2	IN21	CL16	EX16	C
1.000000	-2.176707	-1.063907	0.150030	14.23210
	(0.34018)	(0.20993)	(0.04191)	

Log likelihood 247.2050

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

P2	IN21	CL16	EX16	C
1.000000	0.000000	1.358787	0.266697	5.515131
		(0.99426)	(0.11404)	
0.000000	1.000000	1.113009	0.053598	-4.004661
		(0.49962)	(0.05731)	

Log likelihood 252.8726

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

P2	IN21	CL16	EX16	C
1.000000	0.000000	0.000000	0.536125	8.295490
			(0.16999)	
0.000000	1.000000	0.000000	0.274292	-1.727214
			(0.15243)	
0.000000	0.000000	1.000000	-0.198286	-2.046207
			(0.18510)	

Log likelihood 256.1879

	P2	IN21	CL16	EX16
Mean	-4.334485	3.770214	0.530385	-5.892370
Median	-4.294241	3.786092	0.575499	-6.062375
Maximum	-3.403275	4.015968	2.206695	-2.100707
Minimum	-5.385586	3.341498	-2.684695	-10.55799
Std. Dev.	0.580122	0.160939	0.767945	2.448502
Skewness	-0.115179	-0.502361	-0.864212	-0.081808
Kurtosis	1.955590	2.438020	5.857972	1.989210
Jarque-Bera	2.478357	4.417624	33.46635	3.494887
Probability	0.289622	0.109831	0.000000	0.174219
Observations	52	80	72	80

17. Germany to N. Cyprus
Date: 03/22/98 Time: 18:00
Sample: 1976:1 1995:4
Included observations: 47
Test assumption: Linear deterministic trend in the data
Series: P3 IN4 CL17 EX17
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.459120	53.37051	47.21	54.46	None *
0.230204	24.48626	29.68	35.65	At most 1
0.166137	12.18967	15.41	20.04	At most 2
0.074728	3.650394	3.76	6.65	At most 3

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

P3	IN4	CL17	EX17
-0.472568	0.355945	1.266045	0.161761
0.376175	-0.343964	-0.162970	-0.061471
-0.374422	0.133172	-0.155742	-0.240252
0.066801	-1.275952	0.409130	-0.098261

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

P3	IN4	CL17	EX17	C
1.000000	-0.753215	-2.679076	-0.342301	8.517891
	(0.41413)	(0.51929)	(0.12799)	

Log likelihood 225.4307

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

P3	IN4	CL17	EX17	C
1.000000	0.000000	-13.17562	-1.178391	10.35818
		(64.2067)	(5.85239)	
0.000000	1.000000	-13.93566	-1.110029	2.443253
		(81.7819)	(7.45436)	

Log likelihood 231.5790

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

P3	IN4	CL17	EX17	C
1.000000	0.000000	0.000000	0.996295	11.75101
			(1.91041)	
0.000000	1.000000	0.000000	1.190106	3.916422
			(2.73226)	
0.000000	0.000000	1.000000	0.165054	0.105712
			(0.33868)	

Log likelihood 235.8486

	P3	IN4	CL17	EX17
Mean	-4.519189	4.687447	0.993501	-5.738194
Median	-4.311743	4.721710	1.123074	-5.557709
Maximum	-3.100564	5.212806	2.993741	-1.818626
Minimum	-6.192600	4.147323	-2.507330	-10.63857
Std. Dev.	0.759464	0.296816	0.900040	2.519497
Skewness	-0.409044	-0.138100	-0.804010	-0.199741
Kurtosis	2.254606	1.694946	5.065459	1.983982
Jarque-Bera	2.653908	5.931506	20.55554	3.972928
Probability	0.265284	0.051522	0.000034	0.137180
Observations	52	80	72	80

18. USA to N. Cyprus
Date: 03/22/98 Time: 18:09
Sample: 1976:1 1995:4
Included observations: 47
Test assumption: Linear deterministic trend in the data
Series: P4 IN20 CL18 EX26
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.560845	76.92838	47.21	54.46	None **
0.344690	38.25193	29.68	35.65	At most 1 **
0.205513	18.38750	15.41	20.04	At most 2 *
0.148848	7.574743	3.76	6.65	At most 3 **

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 4 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

P4	IN20	CL18	EX26
-0.476185	2.797435	1.037157	0.237129
0.374728	-7.163627	0.252652	-0.107786
-0.265480	6.674767	-0.355754	0.308303
-0.359033	-2.298894	-0.099380	-0.121694

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

P4	IN20	CL18	EX26	C
1.000000	-5.874677	-2.178053	-0.497976	31.86181
	(2.27139)	(0.45288)	(0.09679)	

Log likelihood 321.7779

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

P4	IN20	CL18	EX26	C
1.000000	0.000000	-3.443418	-0.591289	6.518794
		(0.84215)	(0.20663)	
0.000000	1.000000	-0.215393	-0.015884	-4.313942
		(0.08348)	(0.02048)	

Log likelihood 331.7101

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

P4	IN20	CL18	EX26	C
1.000000	0.000000	0.000000	4.690172	44.09594
			(17.3834)	
0.000000	1.000000	0.000000	0.314483	-1.963411
			(1.05388)	
0.000000	0.000000	1.000000	1.533784	10.91275
			(5.16324)	

Log likelihood 337.1165

	P4	IN20	CL18	EX26
Mean	-6.765617	4.416806	1.288193	-6.418490
Median	-6.734409	4.414366	1.323628	-6.428573
Maximum	-5.701907	4.572115	2.974765	-2.750790
Minimum	-8.313285	4.286090	-1.910548	-10.99625
Std. Dev.	0.480825	0.080608	0.793725	2.381954
Skewness	-0.616138	0.219007	-0.762741	-0.124714
Kurtosis	3.837187	1.966127	5.379382	2.005496
Jarque-Bera	4.808674	4.202503	23.96568	3.504176
Probability	0.090325	0.122303	0.000006	0.173411
Observations	52	80	72	80

Specification error was found. We tried again with lower lag values.

Date: 03/24/98 Time: 09:21
Sample: 1976:1 1995:4
Included observations: 50
Test assumption: Linear deterministic trend in the data
Series: P4 IN20 CL18 EX26
Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.561461	73.07634	47.21	54.46	None **
0.360599	31.86099	29.68	35.65	At most 1 *
0.101521	9.499806	15.41	20.04	At most 2
0.079598	4.147218	3.76	6.65	At most 3 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

P4	IN20	CL18	EX26
-0.098384	-0.030653	0.344087	0.040722
0.314749	-3.168573	0.033764	-0.083306

-0.158482	-4.243826	0.043292	-0.129978
-0.112165	3.502962	0.026157	0.231329

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

P4	IN20	CL18	EX26	C
1.000000	0.311562	-3.497385	-0.413909	6.594527
	(8.11266)	(1.64777)	(0.34708)	

Log likelihood 269.7503

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

P4	IN20	CL18	EX26	C
1.000000	0.000000	-3.389174	-0.409429	7.880181
		(2.64784)	(0.42880)	
0.000000	1.000000	-0.347318	-0.014379	-4.126483
		(0.29070)	(0.04708)	

Log likelihood 280.9309

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

P4	IN20	CL18	EX26	C
1.000000	0.000000	0.000000	0.031292	7.007540
			(0.10442)	
0.000000	1.000000	0.000000	0.030785	-4.215911
			(0.00937)	
0.000000	0.000000	1.000000	0.130038	-0.257479
			(0.05426)	

Log likelihood 283.6072

---

19. Australia to N. Cyprus
Date: 03/22/98 Time: 18:11
Sample: 1976:1 1995:4
Included observations: 47
Test assumption: Linear deterministic trend in the data
Series: P5 IN13 CL19 EX19
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.358255	43.99429	47.21	54.46	None
0.248721	23.14676	29.68	35.65	At most 1
0.130335	9.705776	15.41	20.04	At most 2
0.064672	3.142344	3.76	6.65	At most 3

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. rejects any cointegration at 5% significance level

Unnormalized Cointegrating Coefficients:

P5	IN13	CL19	EX19
-0.409759	-0.167840	0.406430	0.072368
0.095749	0.715849	-0.600935	0.022237
0.010573	1.707182	0.710221	0.122811
0.112457	-1.430253	-0.103387	0.065079

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

P5	IN13	CL19	EX19	C
1.000000	0.409608	-0.991876	-0.176611	7.183713
	(1.12111)	(0.41956)	(0.07426)	

Log likelihood 199.6635

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

P5	IN13	CL19	EX19	C
1.000000	0.000000	-0.685583	-0.200310	8.162721
		(1.19886)	(0.09081)	
0.000000	1.000000	-0.747771	0.057857	-2.390113
		(0.86617)	(0.06561)	

Log likelihood 206.3840

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

P5	IN13	CL19	EX19	C
1.000000	0.000000	0.000000	-0.191317	7.303977
			(0.12383)	
0.000000	1.000000	0.000000	0.067666	-3.326752
			(0.03648)	
0.000000	0.000000	1.000000	0.013117	-1.252575
			(0.06939)	

Log likelihood 209.6657

	P5	IN13	CL19	EX19
Mean	-8.931869	3.756940	1.298259	-6.561196
Median	-8.756969	3.910264	1.340872	-6.790652
Maximum	-7.457716	4.182831	2.972443	-2.528767
Minimum	-11.79998	2.625355	-1.986616	-11.29062
Std. Dev.	0.707206	0.450710	0.783400	2.557449
Skewness	-1.436524	-1.694578	-0.928901	-0.048870
Kurtosis	7.123723	4.341858	5.928773	1.934123
Jarque-Bera	54.72892	44.28987	36.08742	3.818823
Probability	0.000000	0.000000	0.000000	0.148168
Observations	52	80	72	80

20. Turkey to N. Cyprus
Date: 03/22/98 Time: 18:22
Sample: 1976:1 1995:4
Included observations: 67
Test assumption: Linear deterministic trend in the data
Series: P6 IN12 CL20 EX15 FF20
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.460380	71.57614	68.52	76.07	None *
0.198939	30.24447	47.21	54.46	At most 1
0.124560	15.38269	29.68	35.65	At most 2
0.058121	6.469801	15.41	20.04	At most 3
0.036021	2.457962	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

P6	IN12	CL20	EX15	FF20
0.980149	0.701685	-0.200783	0.085406	22.71083
-0.509703	0.083959	-0.345967	-0.513299	-13.88002
-0.455816	3.054306	0.070923	3.171986	12.37935
-0.094030	-0.119201	-0.098673	-0.228283	-8.798153
-0.145156	3.039664	0.063736	3.034286	-2.784764

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

P6	IN12	CL20	EX15	FF20	C

1.000000	0.715896	-0.204850	0.087136	23.17080	1.599352
	(0.62593)	(0.06307)	(0.60148)	(3.23508)	

Log likelihood 688.1776

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

P6	IN12	CL20	EX15	FF20	C
1.000000	0.000000	0.513480	0.834982	26.47202	2.192211
		(1.81884)	(3.62564)	(16.4323)	
0.000000	1.000000	-1.003400	-1.044630	-4.611306	-0.828136
		(2.63327)	(5.24912)	(23.7903)	

Log likelihood 695.6085

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

P6	IN12	CL20	EX15	FF20	C
1.000000	0.000000	0.000000	-0.192568	20.60068	4.181694
			(0.01261)	(3.35931)	
0.000000	1.000000	0.000000	0.963323	6.861955	-4.715816
			(0.00807)	(2.15111)	
0.000000	0.000000	1.000000	2.001148	11.43438	-3.874506
			(0.04715)	(12.5617)	

Log likelihood 700.0649

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

P6	IN12	CL20	EX15	FF20	C
1.000000	0.000000	0.000000	0.000000	6.238550	1.971566
				(36.8594)	
0.000000	1.000000	0.000000	0.000000	78.70867	6.340368
				(181.787)	
0.000000	0.000000	1.000000	0.000000	160.6844	19.09294
				(376.164)	
0.000000	0.000000	0.000000	1.000000	-74.58218	-11.47713
				(188.783)	

Log likelihood 702.0708

	P6	IN12	CL20	EX15	FF20
Mean	-1.608720	-1.050857	-9.104859	6.418490	-0.055020
Median	-1.663711	-1.030285	-8.974972	6.428573	-0.059265
Maximum	-0.799434	2.716432	-1.903936	10.99625	0.008944
Minimum	-2.512501	-5.533273	-17.10583	2.750790	-0.093492
Std. Dev.	0.467029	2.294698	4.204715	2.381954	0.018749
Skewness	0.010305	-0.127529	-0.065741	0.124714	1.667479
Kurtosis	1.925297	2.078545	2.069562	2.005496	6.307923
Jarque-Bera	3.851371	3.047116	2.649008	3.504176	73.54768
Probability	0.145776	0.217935	0.265935	0.173411	0.000000
Observations	80	80	72	80	80

3.5 TURKEY INBOUND

21. Germany to Turkey
Date: 03/22/98 Time: 18:25
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: X1 IN4 CL21 EX21 FF21
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)

0.324476	88.09213	68.52	76.07	None **
0.280143	58.67216	47.21	54.46	At most 1 **
0.236776	34.01949	29.68	35.65	At most 2 *
0.122227	13.75416	15.41	20.04	At most 3
0.051641	3.976634	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 3 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X1	IN4	CL21	EX21	FF21
-0.668403	0.606343	-0.542620	-0.181898	0.983738
0.034636	0.689367	0.563674	0.345872	-0.523274
0.398342	-0.322658	-1.363638	-0.411483	1.721977
-0.215032	-0.003195	0.342905	0.322517	-0.035762
-0.027361	-1.007342	0.605312	0.806304	0.659605

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X1	IN4	CL21	EX21	FF21	C
1.000000	-0.907152	0.811816	0.272138	-1.471774	14.10687
	(0.31782)	(0.48555)	(0.27201)	(0.61355)	

Log likelihood 666.6493

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X1	IN4	CL21	EX21	FF21	C
1.000000	0.000000	1.485844	0.695575	-2.066189	12.02542
		(0.76955)	(0.49351)	(0.79450)	
0.000000	1.000000	0.743016	0.466777	-0.655253	-2.294483
		(0.59353)	(0.38062)	(0.61277)	

Log likelihood 678.9757

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X1	IN4	CL21	EX21	FF21	C
1.000000	0.000000	0.000000	0.229715	-0.045308	7.890874
			(0.29237)	(0.61424)	
0.000000	1.000000	0.000000	0.233817	0.355315	-4.362017
			(0.24572)	(0.51624)	
0.000000	0.000000	1.000000	0.313533	-1.360089	2.782625
			(0.12036)	(0.25287)	

Log likelihood 689.1083

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X1	IN4	CL21	EX21	FF21	C
1.000000	0.000000	0.000000	0.000000	-0.410924	7.603888
				(0.17569)	
0.000000	1.000000	0.000000	0.000000	-0.016830	-4.654128
				(0.16652)	
0.000000	0.000000	1.000000	0.000000	-1.859111	2.390925
				(0.20349)	
0.000000	0.000000	0.000000	1.000000	1.591609	1.249313
				(0.57744)	

Log likelihood 693.9971

	X1	IN4	CL21	EX21	FF21
Mean	-6.416659	4.687447	2.883079	-5.738194	2.849174
Median	-6.633018	4.721710	2.439990	-5.557709	2.520094
Maximum	-4.880121	5.212806	7.831088	-1.818626	5.420550
Minimum	-7.426724	4.147323	-0.920416	-10.63857	1.067518
Std. Dev.	0.688158	0.296816	2.485148	2.519497	1.251677
Skewness	0.288197	-0.138100	0.306634	-0.199741	0.412163
Kurtosis	1.707185	1.694946	1.960665	1.983982	2.008489
Jarque-Bera	6.678668	5.931506	4.854389	3.972928	5.542026
Probability	0.035461	0.051522	0.088284	0.137180	0.062599
Observations	80	80	80	80	80

22. Austria to Turkey
Date: 03/22/98 Time: 18:27
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: X2 IN14 CL22 EX22 FF22
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.419511	82.88763	68.52	76.07	None **
0.265611	42.09628	47.21	54.46	At most 1
0.158247	18.94252	29.68	35.65	At most 2
0.054735	6.022401	15.41	20.04	At most 3
0.023723	1.800638	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X2	IN14	CL22	EX22	FF22
0.455583	-1.444264	-0.198954	1.022905	3.259254
0.499878	0.941226	-0.153286	-0.697616	-1.809022
-0.012806	-1.941011	0.265379	0.705830	1.527354
-0.099090	-0.510318	0.775993	0.764852	0.131972
-0.031075	-2.155070	0.955361	1.414193	1.907915

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X2	IN14	CL22	EX22	FF22	C
1.000000	-3.170147	-0.436703	2.245266	7.154032	13.45030
	(1.19501)	(0.36461)	(0.79044)	(1.81026)	

Log likelihood 697.1395

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X2	IN14	CL22	EX22	FF22	C
1.000000	0.000000	-0.355110	-0.038893	0.395382	7.203584
		(0.34235)	(0.21472)	(1.02023)	
0.000000	1.000000	0.025738	-0.720522	-2.131968	-1.970483
		(0.12415)	(0.07786)	(0.36997)	

Log likelihood 708.7164

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X2	IN14	CL22	EX22	FF22	C
1.000000	0.000000	0.000000	-0.830957	-2.581969	11.18943

			(1.51203)	(4.03558)	
0.000000	1.000000	0.000000	-0.663114	-1.916172	-2.259372
			(0.24619)	(0.65709)	
0.000000	0.000000	1.000000	-2.230477	-8.384313	11.22426
			(3.09126)	(8.25050)	

Log likelihood 715.1764

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X2	IN14	CL22	EX22	FF22	C
1.000000	0.000000	0.000000	0.000000	-0.417648	9.043422
				(0.09565)	
0.000000	1.000000	0.000000	0.000000	-0.189018	-3.971909
				(0.07367)	
0.000000	0.000000	1.000000	0.000000	-2.574787	5.463896
				(0.15070)	
0.000000	0.000000	0.000000	1.000000	2.604612	-2.582569
				(0.11412)	

Log likelihood 717.2873

	X2	IN14	CL22	EX22	FF22
Mean	-8.040950	4.426868	0.835865	-3.781213	2.444169
Median	-8.043783	4.456766	0.386738	-3.607637	2.234962
Maximum	-7.015224	4.994993	5.750108	0.150631	4.493883
Minimum	-9.161332	3.811808	-2.895495	-8.683714	0.912260
Std. Dev.	0.526241	0.325199	2.452071	2.524617	1.013140
Skewness	0.032120	0.029289	0.317806	-0.194989	0.275894
Kurtosis	2.121514	1.762336	1.977768	1.982447	1.988527
Jarque-Bera	2.586216	5.117481	4.829866	3.958324	4.425163
Probability	0.274417	0.077402	0.089373	0.138185	0.109418
Observations	80	80	80	80	80

23. France to Turkey
Date: 03/22/98 Time: 18:29
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: X3 IN3 CL23 EX23 FF23
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.359181	76.46979	68.52	76.07	None **
0.217496	43.09416	47.21	54.46	At most 1
0.191547	24.69993	29.68	35.65	At most 2
0.067061	8.752495	15.41	20.04	At most 3
0.046184	3.546375	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X3	IN3	CL23	EX23	FF23
-0.223546	-0.560905	-0.595117	0.001013	1.558284
-0.492052	0.731310	0.715904	0.067578	-1.576156
0.045582	-1.125350	0.222147	0.371060	0.360815
0.079465	-0.560544	-0.236523	-0.077714	0.549600
0.024905	-1.365121	0.803205	0.923670	0.671515

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X3	IN3	CL23	EX23	FF23	C
1.000000	2.509130	2.662174	-0.004531	-6.970762	7.091622
	(1.95357)	(1.52069)	(0.69045)	(3.61506)	

Log likelihood 622.6579

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X3	IN3	CL23	EX23	FF23	C
1.000000	0.000000	0.076593	-0.087936	-0.581405	8.038009
		(0.99592)	(0.40092)	(1.45097)	
0.000000	1.000000	1.030469	0.033241	-2.546443	-0.377177
		(0.53932)	(0.21711)	(0.78574)	

Log likelihood 631.8550

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X3	IN3	CL23	EX23	FF23	C
1.000000	0.000000	0.000000	-0.110858	-0.443682	7.764200
			(0.13097)	(0.45526)	
0.000000	1.000000	0.000000	-0.275143	-0.693548	-4.060964
			(0.06266)	(0.21780)	
0.000000	0.000000	1.000000	0.299265	-1.798109	3.574865
			(0.08273)	(0.28756)	

Log likelihood 639.8287

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X3	IN3	CL23	EX23	FF23	C
1.000000	0.000000	0.000000	0.000000	-0.276905	7.961881
				(0.35940)	
0.000000	1.000000	0.000000	0.000000	-0.279615	-3.570329
				(0.56045)	
0.000000	0.000000	1.000000	0.000000	-2.248332	3.041215
				(0.63675)	
0.000000	0.000000	0.000000	1.000000	1.504428	1.783202
				(2.05302)	

Log likelihood 642.4318

	X3	IN3	CL23	EX23	FF23
Mean	-7.401084	4.134701	1.362621	-4.670986	1.972953
Median	-7.388234	4.197203	0.757645	-4.434982	1.711008
Maximum	-6.580269	4.484399	6.016670	-1.187200	3.847091
Minimum	-8.411414	3.495898	-1.593101	-9.407014	0.955756
Std. Dev.	0.424373	0.238181	2.168213	2.352785	0.845201
Skewness	-0.024784	-0.837401	0.538268	-0.293045	0.652382
Kurtosis	2.396696	2.927661	2.110180	2.038803	2.247654
Jarque-Bera	1.221444	9.367325	6.502360	4.224668	7.561446
Probability	0.542959	0.009245	0.038728	0.120955	0.022806
Observations	80	80	80	80	80

24. UK to Turkey
Date: 03/23/98 Time: 13:49
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: X4 IN21 CL24 EX24 FF24
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)

0.413720	104.8114	68.52	76.07	None **
0.315767	64.76451	47.21	54.46	At most 1 **
0.228895	36.30522	29.68	35.65	At most 2 **
0.112986	16.81046	15.41	20.04	At most 3 *
0.098996	7.818380	3.76	6.65	At most 4 **

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 5 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X4	IN21	CL24	EX24	FF24
0.275019	1.836204	1.280313	1.198551	2.295838
0.169759	-1.737934	-1.243517	-1.188069	-2.349738
0.191240	-0.969173	0.222669	0.274689	-0.108756
0.093948	0.442355	-0.467579	-0.361265	-0.421792
-0.133307	-0.530013	0.226797	0.132951	-0.883126

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X4	IN21	CL24	EX24	FF24	C
1.000000	6.676636	4.655355	4.358062	8.347914	-6.488355
	(1.83322)	(1.23637)	(1.13233)	(2.15582)	

Log likelihood 700.9832

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X4	IN21	CL24	EX24	FF24	C
1.000000	0.000000	-0.073767	-0.124777	-0.411032	6.912790
		(0.66820)	(0.61808)	(0.79136)	
0.000000	1.000000	0.708309	0.671422	1.311880	-2.007170
		(0.08882)	(0.08216)	(0.10520)	

Log likelihood 715.2129

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X4	IN21	CL24	EX24	FF24	C
1.000000	0.000000	0.000000	-0.048931	-0.311854	7.145449
			(0.09887)	(0.50864)	
0.000000	1.000000	0.000000	-0.056854	0.359575	-4.241156
			(0.03564)	(0.18336)	
0.000000	0.000000	1.000000	1.028189	1.344477	3.153971
			(0.05525)	(0.28426)	

Log likelihood 724.9602

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X4	IN21	CL24	EX24	FF24	C
1.000000	0.000000	0.000000	0.000000	-0.286576	7.431803
				(0.44707)	
0.000000	1.000000	0.000000	0.000000	0.388945	-3.908437
				(0.15290)	
0.000000	0.000000	1.000000	0.000000	0.813324	-2.863207
				(2.49243)	
0.000000	0.000000	0.000000	1.000000	0.516591	5.852211
				(2.55922)	

Log likelihood 729.4563

X4	IN21	CL24	EX24	FF24

Mean	-7.332861	3.770214	2.485776	-5.892370	0.332677
Median	-7.374897	3.786092	2.348577	-6.062375	0.294751
Maximum	-5.840343	4.015968	6.957291	-2.100707	0.883740
Minimum	-8.385976	3.341498	-0.645408	-10.55799	0.023273
Std. Dev.	0.659493	0.160939	2.184194	2.448502	0.194646
Skewness	0.287233	-0.502361	0.312013	-0.081808	0.812910
Kurtosis	2.133132	2.438020	2.041595	1.989210	3.061241
Jarque-Bera	3.604904	4.417624	4.359826	3.494887	8.823471
Probability	0.164894	0.109831	0.113051	0.174219	0.012134
Observations	80	80	80	80	80

Specification error was found. We tried again with lower lag values.
Date: 03/24/98 Time: 09:27
Sample: 1976:1 1995:4
Included observations: 78
Test assumption: Linear deterministic trend in the data
Series: X4 IN21 CL24 EX24 FF24
Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.384816	87.50414	68.52	76.07	None **
0.270650	49.60909	47.21	54.46	At most 1 *
0.195281	24.99215	29.68	35.65	At most 2
0.072030	8.045657	15.41	20.04	At most 3
0.027994	2.214709	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X4	IN21	CL24	EX24	FF24
-0.039300	0.191064	0.398361	0.407942	0.707562
-0.275421	-0.370088	-0.277495	-0.315394	-0.718471
-0.065193	1.436084	0.987242	0.890577	1.832602
0.009636	1.090176	-0.078567	-0.026832	0.390203
-0.013946	-0.505773	0.342104	0.288950	-0.538297

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X4	IN21	CL24	EX24	FF24	C
1.000000	-4.861735	-10.13651	-10.38032	-18.00431	-4.328298
	(8.76960)	(11.2680)	(11.6048)	(21.1178)	

Log likelihood 634.2381

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X4	IN21	CL24	EX24	FF24	C
1.000000	0.000000	-1.405580	-1.350567	-1.854858	3.497559
		(2.75889)	(2.86403)	(4.34397)	
0.000000	1.000000	1.795847	1.857311	3.321746	1.609684
		(1.73451)	(1.80061)	(2.73105)	

Log likelihood 646.5465

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X4	IN21	CL24	EX24	FF24	C
1.000000	0.000000	0.000000	0.206432	0.699021	8.331152
			(0.16773)	(0.80023)	

0.000000	1.000000	0.000000	-0.131998	0.058769	-4.565982
			(0.11229)	(0.53574)	
0.000000	0.000000	1.000000	1.107727	1.816958	3.438860
			(0.14057)	(0.67066)	

Log likelihood 655.0198

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X4	IN21	CL24	EX24	FF24	C
1.000000	0.000000	0.000000	0.000000	0.226988	7.274857
				(0.68443)	
0.000000	1.000000	0.000000	0.000000	0.360598	-3.890562
				(0.21847)	
0.000000	0.000000	1.000000	0.000000	-0.716003	-2.229285
				(2.48398)	
0.000000	0.000000	0.000000	1.000000	2.286629	5.116914
				(2.51575)	

Log likelihood 657.9353

25. Italy to Turkey
Date: 03/22/98 Time: 19:06
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: X5 IN18 CL25 EX25 FF25
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.460054	112.3933	68.52	76.07	None **
0.416086	66.17179	47.21	54.46	At most 1 **
0.210594	25.82172	29.68	35.65	At most 2
0.061414	8.086173	15.41	20.04	At most 3
0.043462	3.332603	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X5	IN18	CL25	EX25	FF25
-0.375669	-0.694010	-0.091477	0.040503	1.816955
-0.717679	2.248538	-0.358152	-0.418212	-3.157719
0.510011	-3.128170	0.199852	0.392239	3.507126
-0.023691	0.641160	-0.017115	0.026734	-0.653368
0.032383	1.244123	-0.707248	-0.591237	-0.793470

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X5	IN18	CL25	EX25	FF25	C
1.000000	1.847399	0.243504	-0.107816	-4.836585	7.060292
	(1.86046)	(0.24716)	(0.29628)	(2.98996)	

Log likelihood 723.6055

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X5	IN18	CL25	EX25	FF25	C
1.000000	0.000000	0.338290	0.148327	-1.410505	10.59088
		(0.14773)	(0.10066)	(0.50242)	
0.000000	1.000000	-0.051308	-0.138651	-1.854542	-1.911115
		(0.05148)	(0.03508)	(0.17507)	

Log likelihood 743.7805

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X5	IN18	CL25	EX25	FF25	C
1.000000	0.000000	0.000000	-0.149200	-5.410733	12.64690
			(0.14571)	(7.48854)	
0.000000	1.000000	0.000000	-0.093525	-1.247835	-2.222948
			(0.01682)	(0.86464)	
0.000000	0.000000	1.000000	0.879503	11.82484	-6.077678
			(0.39546)	(20.3243)	

Log likelihood 752.6483

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X5	IN18	CL25	EX25	FF25	C
1.000000	0.000000	0.000000	0.000000	-5.075187	12.27485
				(9.66920)	
0.000000	1.000000	0.000000	0.000000	-1.037500	-2.456166
				(3.87856)	
0.000000	0.000000	1.000000	0.000000	9.846864	-3.884509
				(42.2336)	
0.000000	0.000000	0.000000	1.000000	2.248966	-2.493645
				(41.3602)	

Log likelihood 755.0251

	X5	IN18	CL25	EX25	FF25
Mean	-8.003771	3.331906	-4.463337	0.718532	0.836904
Median	-7.981740	3.383749	-5.125128	0.967098	0.846447
Maximum	-7.352570	3.694353	-0.492058	3.982945	1.325096
Minimum	-8.726748	2.734264	-6.850223	-3.628099	0.419714
Std. Dev.	0.330124	0.228364	1.843675	2.210297	0.202020
Skewness	-0.279552	-0.827989	0.571100	-0.241382	0.153411
Kurtosis	2.479901	2.912429	2.040704	1.946925	2.665685
Jarque-Bera	1.943670	9.166444	7.416232	4.473428	0.686354
Probability	0.378388	0.010222	0.024524	0.106809	0.709513
Observations	80	80	80	80	80

26.USA to Turkey
Date: 03/22/98 Time: 19:08
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: X6 IN20 CL26 EX26 FF26
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.369618	82.56503	68.52	76.07	None **
0.261045	47.95789	47.21	54.46	At most 1 *
0.187007	25.26906	29.68	35.65	At most 2
0.089970	9.741619	15.41	20.04	At most 3
0.034984	2.670782	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X6	IN20	CL26	EX26	FF26
-0.504897	3.115365	-0.697104	0.797680	3.103828

-0.102746	-9.733977	1.164524	-0.569487	-3.297581
-0.281477	1.803264	0.297890	0.136874	-0.334072
-0.231483	0.762466	-0.354526	-0.635711	-0.853683
-0.054700	-0.962465	0.471067	0.239090	-0.527903

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X6	IN20	CL26	EX26	FF26	C
1.000000	-6.170299	1.380685	-1.579886	-6.147449	38.81234
	(3.12724)	(0.47015)	(0.38440)	(1.51207)	

Log likelihood 796.0034

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X6	IN20	CL26	EX26	FF26	C
1.000000	0.000000	0.603214	-1.144360	-3.809053	9.685316
		(0.24332)	(0.31350)	(0.88961)	
0.000000	1.000000	-0.126002	0.070584	0.378976	-4.720520
		(0.01522)	(0.01961)	(0.05564)	

Log likelihood 807.3478

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X6	IN20	CL26	EX26	FF26	C
1.000000	0.000000	0.000000	-0.873074	-1.995125	7.809526
			(0.34531)	(0.79348)	
0.000000	1.000000	0.000000	0.013917	7.46E-05	-4.328697
			(0.05343)	(0.12278)	
0.000000	0.000000	1.000000	-0.449734	-3.007105	3.109658
			(0.40033)	(0.91991)	

Log likelihood 815.1116

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X6	IN20	CL26	EX26	FF26	C
1.000000	0.000000	0.000000	0.000000	0.068023	7.081826
				(0.08951)	
0.000000	1.000000	0.000000	0.000000	-0.032812	-4.317097
				(0.01026)	
0.000000	0.000000	1.000000	0.000000	-1.944345	2.734808
				(0.07712)	
0.000000	0.000000	0.000000	1.000000	2.363084	-0.833492
				(0.07695)	

Log likelihood 818.6470

	X6	IN20	CL26	EX26	FF26
Mean	-7.294316	4.416806	3.230489	-6.418490	3.070494
Median	-7.216644	4.414366	2.941536	-6.428573	3.000101
Maximum	-6.784368	4.572115	7.722650	-2.750790	5.014950
Minimum	-8.322928	4.286090	0.010910	-10.99625	1.549603
Std. Dev.	0.350193	0.080608	2.208062	2.381954	1.003701
Skewness	-1.011633	0.219007	0.328991	-0.124714	0.161894
Kurtosis	3.454595	1.966127	2.029592	2.005496	2.091215
Jarque-Bera	14.33420	4.202503	4.582107	3.504176	3.102429
Probability	0.000772	0.122303	0.101160	0.173411	0.211990
Observations	80	80	80	80	80

27. N. Cyprus to Turkey
Date: 03/22/98 Time: 19:10

Sample: 1976:1 1995:4
Included observations: 35
Test assumption: Linear deterministic trend in the data
Series: X7 IN23 CL27 EX15 FF27
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.800285	136.3867	68.52	76.07	None **
0.655179	80.00643	47.21	54.46	At most 1 **
0.503555	42.74084	29.68	35.65	At most 2 **
0.345819	18.23095	15.41	20.04	At most 3 *
0.092002	3.377956	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 4 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X7	IN23	CL27	EX15	FF27
4.023505	7.194364	-6.511318	-0.580795	2.010788
-5.224014	8.647668	-7.326299	-0.175589	-3.400460
-0.386201	1.535877	-1.648238	-0.242834	0.799080
-0.344590	-2.439851	4.229081	-0.042849	-3.066371
0.495169	1.546238	-3.152292	-0.194877	1.785330

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X7	IN23	CL27	EX15	FF27	C
1.000000	1.788084	-1.618320	-0.144350	0.499760	3.341477
	(0.38257)	(0.34688)	(0.02075)	(0.07375)	

Log likelihood 346.4639

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X7	IN23	CL27	EX15	FF27	C
1.000000	0.000000	-0.049734	-0.051940	0.578258	9.477665
		(0.04342)	(0.00438)	(0.05592)	
0.000000	1.000000	-0.877244	-0.051681	-0.043900	-3.431711
		(0.02509)	(0.00253)	(0.03231)	

Log likelihood 365.0967

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X7	IN23	CL27	EX15	FF27	C
1.000000	0.000000	0.000000	-0.023427	0.408933	9.182932
			(0.04962)	(0.18101)	
0.000000	1.000000	0.000000	0.451242	-3.030544	-8.630366
			(0.76733)	(2.79922)	
0.000000	0.000000	1.000000	0.573300	-3.404577	-5.926124
			(0.87300)	(3.18472)	

Log likelihood 377.3517

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X7	IN23	CL27	EX15	FF27	C
1.000000	0.000000	0.000000	0.000000	0.339415	8.867290
				(0.08044)	
0.000000	1.000000	0.000000	0.000000	-1.691514	-2.550577

				(0.22465)	
0.000000	0.000000	1.000000	0.000000	-1.703350	1.798201
				(0.20805)	
0.000000	0.000000	0.000000	1.000000	-2.967429	-13.47344
				(1.39021)	

Log likelihood 384.7782

	X7	IN23	CL27	EX15	FF27
Mean	-8.318100	-0.369035	-4.524884	6.418490	-1.459878
Median	-8.343386	-0.363785	-4.546894	6.428573	-1.518025
Maximum	-7.840477	2.593988	-1.245757	10.99625	1.521348
Minimum	-8.734115	-1.927235	-6.396781	2.750790	-3.091520
Std. Dev.	0.209841	0.778659	0.799148	2.381954	0.732043
Skewness	0.491605	0.598488	0.858325	0.124714	0.977016
Kurtosis	2.870669	4.650224	5.866956	2.005496	5.525408
Jarque-Bera	1.639049	12.46798	33.49897	3.504176	30.58779
Probability	0.440641	0.001962	0.000000	0.173411	0.000000
Observations	40	72	72	80	72

28. Israel to Turkey
Date: 03/22/98 Time: 19:12
Sample: 1976:1 1995:4
Included observations: 35
Test assumption: Linear deterministic trend in the data
Series: X8 IN17 CL28 EX28 FF28
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.885178	194.5351	68.52	76.07	None **
0.806503	118.7822	47.21	54.46	At most 1 **
0.709870	61.29493	29.68	35.65	At most 2 **
0.388061	17.98500	15.41	20.04	At most 3 *
0.022477	0.795683	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 4 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X8	IN17	CL28	EX28	FF28
0.701479	-13.39007	3.217227	-3.808388	9.949255
1.283020	15.16022	12.10599	20.35929	-13.15719
0.300800	0.301089	7.712391	2.689304	3.892373
0.528131	-0.213755	-0.930496	1.769482	-1.720815
0.631890	7.608148	1.848108	5.025419	-5.049057

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X8	IN17	CL28	EX28	FF28	C
1.000000	-19.08834	4.586349	-5.429085	14.18326	-19.41867
	(3.97038)	(0.82859)	(2.54260)	(3.08599)	

Log likelihood 433.3161

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X8	IN17	CL28	EX28	FF28	C
1.000000	0.000000	7.581493	7.725386	-0.911143	89.93864
		(0.43429)	(0.28739)	(0.25282)	
0.000000	1.000000	0.156910	0.689137	-0.790765	5.729011
		(0.02930)	(0.01939)	(0.01706)	

Log likelihood 462.0598

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X8	IN17	CL28	EX28	FF28	C
1.000000	0.000000	0.000000	7.502899	-7.112668	28.00894
			(0.90831)	(0.94190)	
0.000000	1.000000	0.000000	0.684532	-0.919115	4.447290
			(0.02543)	(0.02637)	
0.000000	0.000000	1.000000	0.029346	0.817982	8.168536
			(0.10892)	(0.11295)	

Log likelihood 483.7147

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X8	IN17	CL28	EX28	FF28	C
1.000000	0.000000	0.000000	0.000000	2.548386	22.38346
				(1.21769)	
0.000000	1.000000	0.000000	0.000000	-0.037682	3.934045
				(0.11765)	
0.000000	0.000000	1.000000	0.000000	0.855769	8.146533
				(0.03263)	
0.000000	0.000000	0.000000	1.000000	-1.287643	0.749775
				(0.17453)	

Log likelihood 492.3094

	X8	IN17	CL28	EX28	FF28
Mean	-8.692301	-1.685835	-0.251617	-8.191115	-5.150005
Median	-8.978033	-3.852387	-2.343276	-8.305161	-4.917713
Maximum	-6.425839	3.523465	7.193099	-5.901900	-3.166419
Minimum	-10.52095	-4.385825	-4.800988	-9.944895	-7.265976
Std. Dev.	1.146727	2.939098	4.295836	1.305605	1.145257
Skewness	0.505973	0.594653	0.557500	0.238340	-0.307522
Kurtosis	2.203082	1.631355	1.634335	1.609910	1.934715
Jarque-Bera	2.765190	10.95879	10.36088	7.198579	2.774039
Probability	0.250927	0.004172	0.005626	0.027343	0.249819
Observations	40	80	80	80	44

29.Denmark to Turkey
Date: 03/22/98 Time: 19:13
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: X9 IN2 CL29 EX29 FF29
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.342651	71.19800	68.52	76.07	None *
0.229172	39.73246	47.21	54.46	At most 1
0.128249	20.21073	29.68	35.65	At most 2
0.099963	9.916876	15.41	20.04	At most 3
0.026547	2.017962	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X9	IN2	CL29	EX29	FF29
-0.563018	0.747097	-0.092587	-0.075889	0.598036
-0.098532	-1.135140	0.334959	0.500694	0.803622

-0.126078	-0.743963	1.137204	0.608309	-1.250239
-0.051572	0.653621	-0.894053	-0.830826	-0.003801
-0.309524	0.064389	0.580531	0.200557	-1.107383

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X9	IN2	CL29	EX29	FF29	C
1.000000	-1.326951	0.164447	0.134789	-1.062197	17.80013
	(0.48335)	(0.46217)	(0.33523)	(0.60061)	

Log likelihood 642.6023

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X9	IN2	CL29	EX29	FF29	C
1.000000	0.000000	-0.203655	-0.403979	-1.794875	11.56198
		(0.43124)	(0.21877)	(0.84675)	
0.000000	1.000000	-0.277404	-0.406020	-0.552152	-4.701116
		(0.21537)	(0.10926)	(0.42289)	

Log likelihood 652.3632

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X9	IN2	CL29	EX29	FF29	C
1.000000	0.000000	0.000000	-0.346534	-2.219514	12.41421
			(0.14265)	(0.49756)	
0.000000	1.000000	0.000000	-0.327773	-1.130564	-3.540269
			(0.09008)	(0.31419)	
0.000000	0.000000	1.000000	0.282067	-2.085086	4.184678
			(0.14385)	(0.50176)	

Log likelihood 657.5101

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X9	IN2	CL29	EX29	FF29	C
1.000000	0.000000	0.000000	0.000000	-1.092291	11.75773
				(0.16650)	
0.000000	1.000000	0.000000	0.000000	-0.064368	-4.161207
				(0.13182)	
0.000000	0.000000	1.000000	0.000000	-3.002608	4.719031
				(0.21105)	
0.000000	0.000000	0.000000	1.000000	3.252848	-1.894416
				(0.38921)	

Log likelihood 661.4595

	X9	IN2	CL29	EX29	FF29
Mean	-9.596616	4.297727	1.198347	-4.497709	1.978364
Median	-9.748655	4.386585	0.631828	-4.251696	1.783169
Maximum	-7.860868	4.705138	5.915542	-0.947432	3.626323
Minimum	-10.87289	3.758088	-1.817261	-9.282452	1.088745
Std. Dev.	0.789979	0.236119	2.221273	2.391480	0.687296
Skewness	0.564789	-0.608858	0.510881	-0.285084	0.763340
Kurtosis	2.228961	2.489880	2.073225	2.008005	2.641509
Jarque-Bera	6.234831	5.810174	6.343035	4.363822	8.197554
Probability	0.044271	0.054744	0.041940	0.112826	0.016593
Observations	80	80	80	80	80

30. Switzerland to Turkey
Date: 03/22/98 Time: 19:15
Sample: 1976:1 1995:4

Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: X10 IN11 CL30 EX30 FF30
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.423001	91.02223	68.52	76.07	None **
0.289884	49.77864	47.21	54.46	At most 1 *
0.164832	24.10416	29.68	35.65	At most 2
0.074945	10.59501	15.41	20.04	At most 3
0.061399	4.752389	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X10	IN11	CL30	EX30	FF30
0.572404	-0.664905	0.102497	0.636355	1.219218
0.153692	1.013643	0.385037	-0.480180	-2.096964
0.087278	-1.063817	0.087305	0.105310	0.204923
-0.024476	0.719956	-0.521884	-0.584352	-0.445933
-0.124862	-0.623708	0.720711	0.904159	0.557886

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X10	IN11	CL30	EX30	FF30	C
1.000000	-1.161601	0.179064	1.111723	2.129996	14.61699
	(0.43550)	(0.22999)	(0.31803)	(0.61037)	

Log likelihood 659.6556

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X10	IN11	CL30	EX30	FF30	C
1.000000	0.000000	0.527412	0.477376	-0.232162	10.53210
		(0.33771)	(0.22125)	(0.61565)	
0.000000	1.000000	0.299886	-0.546098	-2.033537	-3.516606
		(0.19576)	(0.12825)	(0.35688)	

Log likelihood 672.4928

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X10	IN11	CL30	EX30	FF30	C
1.000000	0.000000	0.000000	1.234615	2.604912	8.704647
			(1.10937)	(2.51144)	
0.000000	1.000000	0.000000	-0.115532	-0.420379	-4.555694
			(0.51634)	(1.16891)	
0.000000	0.000000	1.000000	-1.435765	-5.379239	3.464942
			(1.98015)	(4.48273)	

Log likelihood 679.2474

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X10	IN11	CL30	EX30	FF30	C
1.000000	0.000000	0.000000	0.000000	-0.315912	9.579646
				(0.14278)	
0.000000	1.000000	0.000000	0.000000	-0.147055	-4.637574
				(0.07640)	

0.000000	0.000000	1.000000	0.000000	-1.982539 (0.14872)	2.447385
0.000000	0.000000	0.000000	1.000000	2.365778 (0.16079)	-0.708722

Log likelihood 682.1687

	X10	IN11	CL30	EX30	FF30
Mean	-8.718224	5.035061	3.054706	-5.878444	2.785602
Median	-8.671068	5.058250	2.661873	-5.731965	2.609148
Maximum	-7.848901	5.569862	8.053999	-1.820912	5.291623
Minimum	-9.765092	4.436536	-0.912500	-10.85605	0.992450
Std. Dev.	0.481002	0.311000	2.488589	2.549504	1.190224
Skewness	-0.229434	-0.204585	0.262591	-0.165718	0.294537
Kurtosis	2.029578	1.883814	2.019916	2.015384	2.047902
Jarque-Bera	3.840930	4.710975	4.121265	3.597729	4.178331
Probability	0.146539	0.094847	0.127373	0.165487	0.123790
Observations	80	80	80	80	80

31. Greece to Turkey
Date: 03/22/98 Time: 19:17
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: X11 IN5 CL31 EX31 FF31
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.420849	82.31686	68.52	76.07	None **
0.223487	41.35245	47.21	54.46	At most 1
0.130897	22.38178	29.68	35.65	At most 2
0.111179	11.85980	15.41	20.04	At most 3
0.039471	3.020364	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X11	IN5	CL31	EX31	FF31
-0.342736	-0.829935	-0.371642	-0.474152	1.321429
-0.647008	3.505729	-3.624036	-3.251355	-0.043551
-0.446964	0.384969	-0.656020	-0.368609	-0.465972
0.047738	-0.026291	0.316518	0.097551	-0.032156
-0.031860	0.320428	-0.677574	-0.492999	-0.007823

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X11	IN5	CL31	EX31	FF31	C
1.000000	2.421501 (2.09360)	1.084341 (1.18920)	1.383432 (0.95321)	-3.855532 (1.32709)	3.549006

Log likelihood 573.4930

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X11	IN5	CL31	EX31	FF31	C
1.000000	0.000000	2.479470 (0.23694)	2.508270 (0.28270)	-2.643884 (0.42576)	15.60157
0.000000	1.000000	-0.576142 (0.05350)	-0.464521 (0.06383)	-0.500371 (0.09613)	-4.977309

Log likelihood 582.9783

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X11	IN5	CL31	EX31	FF31	C
1.000000	0.000000	0.000000	-0.917771	2.708837	7.932428
			(0.46595)	(1.05453)	
0.000000	1.000000	0.000000	0.331571	-1.744156	-3.195268
			(0.12194)	(0.27598)	
0.000000	0.000000	1.000000	1.381763	-2.158816	3.093055
			(0.20041)	(0.45357)	

Log likelihood 588.2393

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X11	IN5	CL31	EX31	FF31	C
1.000000	0.000000	0.000000	0.000000	1.188195	8.362651
				(0.42218)	
0.000000	1.000000	0.000000	0.000000	-1.194780	-3.350699
				(0.13263)	
0.000000	0.000000	1.000000	0.000000	0.130610	2.445326
				(0.49587)	
0.000000	0.000000	0.000000	1.000000	-1.656887	0.468770
				(0.37275)	

Log likelihood 592.6590

	X11	IN5	CL31	EX31	FF31
Mean	-7.399732	2.366987	-2.364419	-1.795565	-0.819288
Median	-7.385748	2.160925	-2.756778	-1.470428	-0.954313
Maximum	-6.113270	3.714044	0.215318	0.836693	0.201629
Minimum	-8.518669	1.387125	-3.597843	-5.528020	-2.123708
Std. Dev.	0.561387	0.692382	0.970785	1.741435	0.746241
Skewness	-0.063216	0.413429	1.010494	-0.372320	-0.060171
Kurtosis	2.690486	1.781189	3.135420	2.272462	1.696019
Jarque-Bera	0.372613	7.230646	13.67577	3.612661	5.716163
Probability	0.830019	0.026908	0.001072	0.164256	0.057379
Observations	80	80	80	80	80

32. Belgium to Turkey
Date: 03/22/98 Time: 19:22
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: X12 IN1 CL32 EX32 FF32
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.304841	68.56260	68.52	76.07	None *
0.241187	41.29147	47.21	54.46	At most 1
0.145508	20.59152	29.68	35.65	At most 2
0.074449	8.797942	15.41	20.04	At most 3
0.039152	2.995463	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

X12	IN1	CL32	EX32	FF32
-0.515660	-0.561030	0.313236	0.649214	1.091489
-0.103532	-0.557577	0.426821	0.187807	-0.494436
0.224555	-0.115506	-1.337573	-0.529838	1.614788

-0.084523	0.595952	-0.548929	-0.699849	-0.342931
0.101248	-1.529648	0.592689	1.043169	1.335978

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X12	IN1	CL32	EX32	FF32	C
1.000000	1.087986	-0.607447	-1.258997	-2.116685	5.956020
	(0.63168)	(0.51987)	(0.48826)	(0.92936)	

Log likelihood 641.8925

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X12	IN1	CL32	EX32	FF32	C
1.000000	0.000000	0.282461	-1.118491	-3.861580	15.59308
		(1.07998)	(0.80892)	(3.42333)	
0.000000	1.000000	-0.817940	-0.129143	1.603785	-8.857708
		(0.76877)	(0.57582)	(2.43686)	

Log likelihood 652.2425

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X12	IN1	CL32	EX32	FF32	C
1.000000	0.000000	0.000000	-1.173944	-3.357814	14.12964
			(0.81073)	(2.11697)	
0.000000	1.000000	0.000000	0.031435	0.144997	-4.619938
			(0.52257)	(1.36454)	
0.000000	0.000000	1.000000	0.196321	-1.783490	5.181025
			(0.29775)	(0.77749)	

Log likelihood 658.1393

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X12	IN1	CL32	EX32	FF32	C
1.000000	0.000000	0.000000	0.000000	-0.560084	10.53381
				(0.25350)	
0.000000	1.000000	0.000000	0.000000	0.070081	-4.523651
				(0.13510)	
0.000000	0.000000	1.000000	0.000000	-2.251359	5.782363
				(0.10838)	
0.000000	0.000000	0.000000	1.000000	2.383190	-3.063039
				(0.25762)	

Log likelihood 661.0405

	X12	IN1	CL32	EX32	FF32
Mean	-9.161407	4.345193	-0.240979	-2.794429	2.468038
Median	-9.273132	4.399898	-0.817450	-2.538213	2.118994
Maximum	-7.889090	4.880773	4.583155	0.915332	4.831294
Minimum	-10.57061	3.636132	-3.654294	-7.615255	1.024177
Std. Dev.	0.648136	0.291406	2.325751	2.422297	1.071416
Skewness	0.300358	-0.537314	0.426630	-0.268438	0.584215
Kurtosis	2.190802	2.432472	2.045564	2.023113	2.270072
Jarque-Bera	3.385541	4.923047	5.463330	4.141817	6.326741
Probability	0.184009	0.085305	0.065111	0.126071	0.042283
Observations	80	80	80	80	80

33. Netherlands to Turkey
Date: 03/22/98 Time: 19:23
Sample: 1976:1 1995:4
Included observations: 75

Test assumption: Linear deterministic trend in the data
Series: X13 IN9 CL33 EX33 FF33
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.275152	57.58663	68.52	76.07	None
0.221809	33.45208	47.21	54.46	At most 1
0.101271	14.64332	29.68	35.65	At most 2
0.070396	6.635260	15.41	20.04	At most 3
0.015355	1.160545	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. rejects any cointegration at 5% significance level

Unnormalized Cointegrating Coefficients:

X13	IN9	CL33	EX33	FF33
-0.629974	-0.602642	0.681258	0.566416	0.139596
0.060846	-0.777173	0.677168	0.480281	-0.181915
-0.314187	0.285831	-0.300522	-0.195700	0.112341
-0.011011	0.421302	-0.953038	-0.831885	0.161375
-0.049255	-0.486373	-0.290314	0.054406	0.509429

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

X13	IN9	CL33	EX33	FF33	C
1.000000	0.956615	-1.081408	-0.899111	-0.221591	3.051892
	(0.35465)	(0.42189)	(0.32908)	(0.16402)	

Log likelihood 554.7802

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

X13	IN9	CL33	EX33	FF33	C
1.000000	0.000000	-0.230617	-0.286482	-0.414467	9.356244
		(0.35051)	(0.23594)	(0.22146)	
0.000000	1.000000	-0.889377	-0.640414	0.201623	-6.590270
		(0.24519)	(0.16505)	(0.15491)	

Log likelihood 564.1846

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

X13	IN9	CL33	EX33	FF33	C
1.000000	0.000000	0.000000	-0.087144	-0.267846	9.094209
			(0.25096)	(0.77720)	
0.000000	1.000000	0.000000	0.128337	0.767068	-7.600811
			(1.10203)	(3.41294)	
0.000000	0.000000	1.000000	0.864370	0.635776	-1.136235
			(1.19457)	(3.69952)	

Log likelihood 568.1886

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

X13	IN9	CL33	EX33	FF33	C
1.000000	0.000000	0.000000	0.000000	-0.876791	12.16271
				(7.36831)	
0.000000	1.000000	0.000000	0.000000	1.663865	-12.11981
				(24.3222)	
0.000000	0.000000	1.000000	0.000000	6.675856	-31.57249
				(104.264)	

0.000000	0.000000	0.000000	1.000000	-6.987838	35.21206
				(107.480)	

Log likelihood 570.9259

	X13	IN9	CL33	EX33	FF33
Mean	-8.514780	5.079501	3.296417	-5.632941	4.129418
Median	-8.683905	5.054037	2.645893	-5.438539	3.078447
Maximum	-6.968096	6.140285	8.827023	-1.762551	9.907949
Minimum	-9.885086	4.078229	-0.973651	-10.52350	1.062492
Std. Dev.	0.742186	0.576771	2.770018	2.503745	2.462087
Skewness	0.388196	0.008055	0.336223	-0.214642	0.698684
Kurtosis	2.022742	1.779490	1.944778	1.986778	2.342411
Jarque-Bera	5.192722	4.966351	5.218925	4.036341	7.950204
Probability	0.074544	0.083478	0.073574	0.132898	0.018777
Observations	80	80	80	80	80

3.6 UK INBOUND

34. USA to UK
Date: 03/22/98 Time: 19:25
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: G1 IN20 CL34 EX34 FF34
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.376960	99.47627	68.52	76.07	None **
0.338839	63.99037	47.21	54.46	At most 1 **
0.240065	32.95850	29.68	35.65	At most 2 *
0.148655	12.36936	15.41	20.04	At most 3
0.003979	0.299043	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 3 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

G1	IN20	CL34	EX34	FF34
-0.991263	0.726007	0.584104	2.488882	4.809845
-0.488603	-3.258443	4.945851	-0.340669	-2.696995
0.514743	0.889635	-1.933256	0.602110	-0.846723
1.395063	-3.428249	-0.387477	1.135793	7.834590
-0.023218	1.103175	0.423676	0.552312	2.371467

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

G1	IN20	CL34	EX34	FF34	C
1.000000	-0.732406	-0.589253	-2.510818	-4.852238	7.541120
	(0.69687)	(0.74444)	(0.78970)	(2.35259)	

Log likelihood 1165.529

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

G1	IN20	CL34	EX34	FF34	C
1.000000	0.000000	-1.532621	-2.193362	-3.825859	4.502522
		(0.44720)	(0.81064)	(2.49790)	
0.000000	1.000000	-1.288041	0.433444	1.401381	-4.148792

		(0.15776)	(0.28597)	(0.88119)	

Log likelihood 1181.045

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

G1	IN20	CL34	EX34	FF34	C
1.000000	0.000000	0.000000	1340.378	-127.6603	731.0640
			(618052.)	(53801.5)	
0.000000	1.000000	0.000000	1128.754	-102.6712	606.4659
			(519498.)	(45222.4)	
0.000000	0.000000	1.000000	875.9971	-80.79914	474.0646
			(403339.)	(35110.7)	

Log likelihood 1191.340

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

G1	IN20	CL34	EX34	FF34	C
1.000000	0.000000	0.000000	0.000000	-14.62395	7.229617
				(11.7811)	
0.000000	1.000000	0.000000	0.000000	-7.481511	-3.086408
				(5.18724)	
0.000000	0.000000	1.000000	0.000000	-6.924814	1.006531
				(4.84031)	
0.000000	0.000000	0.000000	1.000000	-0.084332	0.540022
				(2.15604)	

Log likelihood 1197.375

	G1	IN20	CL34	EX34	FF34
Mean	-4.642891	4.416806	0.218594	-0.526120	0.181242
Median	-4.574908	4.414366	0.214136	-0.523040	0.177158
Maximum	-4.124763	4.572115	0.332883	-0.145398	0.286041
Minimum	-5.252219	4.286090	0.006235	-0.870582	0.052535
Std. Dev.	0.264010	0.080608	0.087361	0.150654	0.047034
Skewness	-0.210979	0.219007	-0.445758	-0.200444	-0.272558
Kurtosis	1.829431	1.966127	2.436328	3.019822	2.608724
Jarque-Bera	5.160936	4.202503	3.708422	0.537013	1.500830
Probability	0.075739	0.122303	0.156576	0.764520	0.472171
Observations	80	80	80	80	80

35. Germany to UK
Date: 03/22/98 Time: 19:27
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: G2 IN4 CL35 EX35 FF35
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.385588	85.51422	68.52	76.07	None **
0.235387	48.98249	47.21	54.46	At most 1 *
0.212072	28.85356	29.68	35.65	At most 2
0.121026	10.97744	15.41	20.04	At most 3
0.017217	1.302482	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

G2	IN4	CL35	EX35	FF35

1.065996	-1.362448	0.397873	1.974065	20.22062
-1.541900	-2.139404	2.018404	-2.278530	-11.39770
-0.176666	2.660934	-1.485675	1.596866	8.313124
-0.022009	-0.586305	-0.121227	-0.391930	0.880107
-1.058530	0.227049	0.562208	1.485291	8.353891

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

G2	IN4	CL35	EX35	FF35	C
1.000000	-1.278098	0.373241	1.851850	18.96875	8.700715
	(0.67636)	(0.42527)	(0.54745)	(4.86286)	

Log likelihood 981.3643

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

G2	IN4	CL35	EX35	FF35	C
1.000000	0.000000	-0.433373	1.672474	13.41796	3.219748
		(0.05487)	(0.38638)	(3.11831)	
0.000000	1.000000	-0.631104	-0.140346	-4.343009	-4.288377
		(0.04111)	(0.28950)	(2.33645)	

Log likelihood 991.4288

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

G2	IN4	CL35	EX35	FF35	C
1.000000	0.000000	0.000000	10.05860	95.73293	-6.606397
			(10.3519)	(106.707)	
0.000000	1.000000	0.000000	12.07206	115.5292	-18.59783
			(14.4641)	(149.096)	
0.000000	0.000000	1.000000	19.35085	189.9404	-22.67367
			(23.6039)	(243.309)	

Log likelihood 1000.367

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

G2	IN4	CL35	EX35	FF35	C
1.000000	0.000000	0.000000	0.000000	-6.175261	5.563076
				(3.52519)	
0.000000	1.000000	0.000000	0.000000	-6.778216	-3.992356
				(3.39927)	
0.000000	0.000000	1.000000	0.000000	-6.111694	0.738103
				(5.42514)	
0.000000	0.000000	0.000000	1.000000	10.13145	-1.209857
				(1.13569)	

Log likelihood 1005.204

	G2	IN4	CL35	EX35	FF35
Mean	-4.932605	4.687447	-0.128816	0.154176	0.103405
Median	-4.955261	4.721710	-0.181474	0.110830	0.104149
Maximum	-4.336480	5.212806	0.473994	1.002004	0.184044
Minimum	-5.497047	4.147323	-0.925091	-0.294195	0.013933
Std. Dev.	0.238168	0.296816	0.390628	0.301019	0.039305
Skewness	0.335279	-0.138100	-0.096667	0.790940	-0.117956
Kurtosis	2.664062	1.694946	1.785046	3.160047	2.522078
Jarque-Bera	1.875009	5.931506	5.044968	8.426521	0.946879
Probability	0.391604	0.051522	0.080260	0.014798	0.622856
Observations	80	80	80	80	80

36. Austria to UK

Date: 03/22/98 Time: 19:32
Sample: 1976:1 1995:4
Included observations: 71
Test assumption: Linear deterministic trend in the data
Series: G3 IN14 CL36 EX36 FF36
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.338089	79.11641	68.52	76.07	None **
0.251320	49.82007	47.21	54.46	At most 1 *
0.202155	29.26958	29.68	35.65	At most 2
0.165907	13.23485	15.41	20.04	At most 3
0.004983	0.354704	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

G3	IN14	CL36	EX36	FF36
0.166988	5.025570	-2.206600	5.981469	22.41498
0.622625	-5.552312	3.163155	-2.304482	-3.959592
-0.572650	0.462044	-0.978805	-1.871992	-6.075976
0.457913	1.664696	-1.852475	0.675760	1.626366
-0.735140	0.829985	0.108044	0.848228	1.017100

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

G3	IN14	CL36	EX36	FF36	C
1.000000	30.09539	-13.21412	35.81974	134.2310	-254.9241
	(39.4884)	(17.5842)	(43.7891)	(160.942)	

Log likelihood 940.6884

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

G3	IN14	CL36	EX36	FF36	C
1.000000	0.000000	0.898601	5.332468	25.77667	-6.523069
		(0.64662)	(1.79810)	(8.33922)	
0.000000	1.000000	-0.468933	1.013022	3.603687	-8.253792
		(0.05096)	(0.14170)	(0.65716)	

Log likelihood 950.9637

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

G3	IN14	CL36	EX36	FF36	C
1.000000	0.000000	0.000000	7.922737	51.25871	-18.60538
			(14.2185)	(102.728)	
0.000000	1.000000	0.000000	-0.338704	-9.694060	-1.948665
			(6.03493)	(43.6019)	
0.000000	0.000000	1.000000	-2.882556	-28.35745	13.44569
			(12.9871)	(93.8308)	

Log likelihood 958.9810

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

G3	IN14	CL36	EX36	FF36	C
1.000000	0.000000	0.000000	0.000000	-8.446875	9.132444
				(3.57991)	

0.000000	1.000000	0.000000	0.000000	-7.141590	-3.134483
				(2.39684)	
0.000000	0.000000	1.000000	0.000000	-6.634565	3.353739
				(2.56526)	
0.000000	0.000000	0.000000	1.000000	7.535980	-3.501041
				(1.24486)	

Log likelihood 965.4211

	G3	IN14	CL36	EX36	FF36
Mean	-7.559188	4.426868	-2.176031	2.111157	0.185256
Median	-7.615919	4.456766	-2.197693	2.065692	0.176561
Maximum	-6.627395	4.994993	-1.611948	2.950179	0.329854
Minimum	-8.125562	3.811808	-2.900171	1.666220	0.038349
Std. Dev.	0.352704	0.325199	0.357381	0.297927	0.060946
Skewness	0.704402	0.029289	-0.095299	0.792884	0.206387
Kurtosis	2.853235	1.762336	1.817576	3.162447	3.178577
Jarque-Bera	6.353189	5.117481	4.781514	8.470165	0.674242
Probability	0.041728	0.077402	0.091560	0.014479	0.713823
Observations	76	80	80	80	80

37. France to UK
Date: 03/22/98 Time: 19:29
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: G4 IN3 CL37 EX37 FF37
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.312524	62.60664	68.52	76.07	None
0.209724	34.50197	47.21	54.46	At most 1
0.128894	16.84903	29.68	35.65	At most 2
0.082684	6.499682	15.41	20.04	At most 3
0.000359	0.026920	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. rejects any cointegration at 5% significance level

Unnormalized Cointegrating Coefficients:

G4	IN3	CL37	EX37	FF37
-1.770673	5.285101	-1.601626	2.291648	0.978773
-0.298911	0.470371	1.935611	1.173783	-12.17060
-0.257216	0.405020	0.852423	-0.011903	-10.79315
-0.148507	-2.039669	1.986597	0.331347	1.661626
0.103676	-0.752593	1.651477	0.638654	2.033294

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

G4	IN3	CL37	EX37	FF37	C
1.000000	-2.984798	0.904530	-1.294224	-0.552769	20.28752
	(0.24981)	(0.34831)	(0.11258)	(1.61445)	

Log likelihood 944.8117

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

G4	IN3	CL37	EX37	FF37	C
1.000000	0.000000	-14.70516	-6.862559	86.73635	-12.89938
		(17.3615)	(7.32540)	(120.350)	
0.000000	1.000000	-5.229730	-1.865565	29.24457	-11.11864
		(5.85131)	(2.46887)	(40.5613)	

Log likelihood 953.6382

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

G4	IN3	CL37	EX37	FF37	C
1.000000	0.000000	0.000000	11.63991	92.67432	-11.47635
			(53.1359)	(461.380)	
0.000000	1.000000	0.000000	4.714639	31.35634	-10.61256
			(19.0062)	(165.031)	
0.000000	0.000000	1.000000	1.258230	0.403802	0.096771
			(4.05187)	(35.1825)	

Log likelihood 958.8129

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

G4	IN3	CL37	EX37	FF37	C
1.000000	0.000000	0.000000	0.000000	-6.997007	5.001692
				(5.16080)	
0.000000	1.000000	0.000000	0.000000	-9.014604	-3.938280
				(1.87047)	
0.000000	0.000000	1.000000	0.000000	-10.37029	1.877984
				(1.53008)	
0.000000	0.000000	0.000000	1.000000	8.562892	-1.415649
				(3.51839)	

Log likelihood 962.0493

	G4	IN3	CL37	EX37	FF37
Mean	-4.866734	4.134701	-1.649275	1.221384	0.022067
Median	-4.909077	4.197203	-1.574277	1.209332	0.025196
Maximum	-3.955739	4.484399	-1.267117	2.115323	0.086387
Minimum	-5.605680	3.495898	-2.250467	0.549036	-0.016342
Std. Dev.	0.327605	0.238181	0.250936	0.348358	0.024333
Skewness	0.244093	-0.837401	-0.726127	0.324261	0.294265
Kurtosis	2.756579	2.927661	2.646265	2.994620	2.532457
Jarque-Bera	0.991935	9.367325	7.447232	1.402031	1.883212
Probability	0.608981	0.009245	0.024147	0.496081	0.390001
Observations	80	80	80	80	80

38. Japan to UK
Date: 03/22/98 Time: 19:34
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: G5 IN19 CL38 EX38 FF38
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.342159	84.09605	68.52	76.07	None **
0.274404	52.68667	47.21	54.46	At most 1 *
0.204135	28.62956	29.68	35.65	At most 2
0.083388	11.50509	15.41	20.04	At most 3
0.064179	4.974804	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

G5	IN19	CL38	EX38	FF38
-1.177748	4.111839	-0.628167	3.095505	4.604722
0.106641	-4.110712	1.073611	-4.038499	-5.195900

0.094327	0.043727	0.663163	1.079920	2.908804
0.740165	-0.718323	-1.754757	-2.857460	-4.378583
0.782389	-5.548163	0.175819	-7.164100	-12.08466

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

G5	IN19	CL38	EX38	FF38	C
1.000000	-3.491273	0.533363	-2.628325	-3.909769	39.04253
	(0.68688)	(0.33543)	(0.88946)	(1.47203)	

Log likelihood 1003.844

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

G5	IN19	CL38	EX38	FF38	C
1.000000	0.000000	-0.416159	0.881450	0.553277	0.580097
		(0.47345)	(0.85786)	(1.66562)	
0.000000	1.000000	-0.271970	1.005300	1.278343	-11.01674
		(0.10351)	(0.18755)	(0.36415)	

Log likelihood 1015.872

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

G5	IN19	CL38	EX38	FF38	C
1.000000	0.000000	0.000000	1.436563	2.184980	-0.642260
			(0.28145)	(0.75288)	
0.000000	1.000000	0.000000	1.368080	2.344702	-11.81558
			(0.10732)	(0.28709)	
0.000000	0.000000	1.000000	1.333896	3.920866	-2.937237
			(0.35529)	(0.95041)	

Log likelihood 1024.435

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

G5	IN19	CL38	EX38	FF38	C
1.000000	0.000000	0.000000	0.000000	8.361976	3.776285
				(9.26444)	
0.000000	1.000000	0.000000	0.000000	8.227230	-7.607671
				(8.84703)	
0.000000	0.000000	1.000000	0.000000	9.656411	1.165528
				(9.76438)	
0.000000	0.000000	0.000000	1.000000	-4.299843	-3.075775
				(6.22396)	

Log likelihood 1027.700

	G5	IN19	CL38	EX38	FF38
Mean	-6.783560	4.646861	-4.647154	4.627254	0.356276
Median	-6.962154	4.529658	-4.719053	4.560906	0.345227
Maximum	-5.839988	5.568419	-3.596845	5.380453	0.589433
Minimum	-7.883631	3.858990	-5.698042	3.971688	0.090738
Std. Dev.	0.599197	0.500100	0.577704	0.359516	0.101878
Skewness	0.144201	0.175279	0.024198	0.257705	0.040331
Kurtosis	1.565942	1.580262	1.752072	1.921050	3.145048
Jarque-Bera	7.132326	7.128490	5.198884	4.765937	0.091817
Probability	0.028264	0.028318	0.074315	0.092276	0.955129
Observations	80	80	80	80	80

39. Finland to UK
Date: 03/22/98 Time: 19:36
Sample: 1976:1 1995:4

Included observations: 71
Test assumption: Linear deterministic trend in the data
Series: G6 IN16 CL39 EX39 FF39
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.349586	67.48807	68.52	76.07	None
0.274544	36.94768	47.21	54.46	At most 1
0.118363	14.15986	29.68	35.65	At most 2
0.069801	5.215613	15.41	20.04	At most 3
0.001102	0.078289	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. rejects any cointegration at 5% significance level

Unnormalized Cointegrating Coefficients:

G6	IN16	CL39	EX39	FF39
-0.638928	2.519127	2.058130	3.549842	7.991322
-0.950277	0.504470	-1.053388	-2.638800	-12.13387
-0.083335	0.946396	-2.036507	0.498882	3.877802
0.320621	0.361388	-3.235955	-2.001939	-2.264665
0.018323	-0.290094	3.300377	1.860806	0.363394

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

G6	IN16	CL39	EX39	FF39	C
1.000000	-3.942739	-3.221223	-5.555932	-12.50739	27.29214
	(0.93377)	(1.56962)	(2.06770)	(6.14555)	

Log likelihood 892.7416

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

G6	IN16	CL39	EX39	FF39	C
1.000000	0.000000	1.782185	4.073407	16.70159	3.922481
		(1.52248)	(1.21192)	(2.53912)	
0.000000	1.000000	1.269018	2.442297	7.408295	-5.927265
		(0.60900)	(0.48477)	(1.01566)	

Log likelihood 904.1355

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

G6	IN16	CL39	EX39	FF39	C
1.000000	0.000000	0.000000	3.223538	15.69680	2.419545
			(0.64858)	(2.23891)	
0.000000	1.000000	0.000000	1.837141	6.692829	-6.997441
			(0.33808)	(1.16707)	
0.000000	0.000000	1.000000	0.476869	0.563794	0.843311
			(0.24634)	(0.85037)	

Log likelihood 908.6076

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

G6	IN16	CL39	EX39	FF39	C
1.000000	0.000000	0.000000	0.000000	3.899026	7.413721
				(2.16550)	
0.000000	1.000000	0.000000	0.000000	-0.030895	-4.151188
				(1.19350)	
0.000000	0.000000	1.000000	0.000000	-1.181492	1.582116

				(0.59827)	
0.000000	0.000000	0.000000	1.000000	3.659885	-1.549284
				(0.76376)	

Log likelihood 911.1763

	G6	IN16	CL39	EX39	FF39
Mean	-8.005424	4.144624	-1.398723	0.986068	0.152441
Median	-8.050788	4.124141	-1.349330	0.950063	0.135621
Maximum	-7.167027	4.646507	-1.126550	1.731009	0.305203
Minimum	-8.727233	3.743008	-1.789940	0.429065	0.033077
Std. Dev.	0.418150	0.206394	0.161094	0.297210	0.063451
Skewness	0.318436	0.356035	-0.648386	0.362985	0.681621
Kurtosis	2.008174	2.310994	2.657747	2.565059	2.879463
Jarque-Bera	4.399531	3.272576	5.995851	2.387359	6.243195
Probability	0.110829	0.194701	0.049890	0.303104	0.044087
Observations	76	80	80	80	80

40. Spain to UK
Date: 03/22/98 Time: 19:38
Sample: 1976:1 1995:4
Included observations: 75
Test assumption: Linear deterministic trend in the data
Series: G7 IN10 CL40 EX40 FF40
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.331784	82.53841	68.52	76.07	None **
0.309100	52.30259	47.21	54.46	At most 1 *
0.169063	24.57054	29.68	35.65	At most 2
0.101358	10.68047	15.41	20.04	At most 3
0.034911	2.665158	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

G7	IN10	CL40	EX40	FF40
1.237566	-1.860732	0.956718	0.548964	12.37046
0.220539	-1.206615	-0.404434	-1.891852	-10.43652
-1.579205	3.026038	-3.342873	0.088070	10.74734
0.532537	-1.172551	0.562638	-1.265578	-7.909018
0.151680	-1.217710	0.278202	-0.715456	-1.363127

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

G7	IN10	CL40	EX40	FF40	C
1.000000	-1.503542	0.773064	0.443583	9.995797	12.30243
	(0.20116)	(0.29258)	(0.36139)	(4.28488)	

Log likelihood 928.8592

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

G7	IN10	CL40	EX40	FF40	C
1.000000	0.000000	1.760949	3.862418	31.71660	-2.553352
		(0.94227)	(0.60981)	(7.67271)	
0.000000	1.000000	0.657039	2.273854	14.44642	-9.880523
		(0.54128)	(0.35030)	(4.40752)	

Log likelihood 942.7252

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

G7	IN10	CL40	EX40	FF40	C
1.000000	0.000000	0.000000	3.383788	43.53747	-10.15017
			(0.60609)	(7.31457)	
0.000000	1.000000	0.000000	2.095269	18.85698	-12.71502
			(0.28494)	(3.43883)	
0.000000	0.000000	1.000000	0.271802	-6.712785	4.314047
			(0.19628)	(2.36883)	

Log likelihood 949.6703

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

G7	IN10	CL40	EX40	FF40	C
1.000000	0.000000	0.000000	0.000000	20.46728	5.231530
				(13.6773)	
0.000000	1.000000	0.000000	0.000000	4.571730	-3.190543
				(8.43111)	
0.000000	0.000000	1.000000	0.000000	-8.565893	5.549579
				(1.54746)	
0.000000	0.000000	0.000000	1.000000	6.817860	-4.545704
				(3.84700)	

Log likelihood 953.6779

	G7	IN10	CL40	EX40	FF40
Mean	-6.356000	2.962109	-5.046137	4.151691	0.057321
Median	-6.480594	3.009809	-5.184865	4.218459	0.042644
Maximum	-5.546261	3.446517	-4.206123	5.007894	0.154233
Minimum	-6.985829	2.278460	-5.585168	3.390414	0.005628
Std. Dev.	0.401386	0.290946	0.408151	0.416930	0.039621
Skewness	0.265433	-0.596797	0.678098	-0.146407	0.851635
Kurtosis	1.619437	2.579755	2.049531	2.167325	2.608760
Jarque-Bera	7.292579	5.337575	9.142196	2.596958	10.18067
Probability	0.026088	0.069336	0.010347	0.272947	0.006156
Observations	80	80	80	80	80

41. The IOM to UK
Date: 03/22/98 Time: 19:40
Sample: 1976:1 1995:4
Included observations: 39
Test assumption: Linear deterministic trend in the data
Series: G8 IN22 CL41 EX15 FF41
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.857383	193.4345	68.52	76.07	None **
0.781599	117.4785	47.21	54.46	At most 1 **
0.682273	58.14300	29.68	35.65	At most 2 **
0.186082	13.42709	15.41	20.04	At most 3
0.129240	5.397151	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 3 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

G8	IN22	CL41	EX15	FF41
4.400530	-1.875548	-37.38120	-0.340849	138.7711
1.005235	2.808329	11.10648	-0.275052	-9.031514
1.494280	-7.882326	14.27799	0.425366	-89.62147
0.392944	-1.684926	3.586806	0.374331	-28.35330

-1.324601	-2.003010	3.055328	0.261576	-19.56018

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

G8	IN22	CL41	EX15	FF41	C
1.000000	-0.426210	-8.494705	-0.077456	31.53508	8.549086
	(0.12581)	(0.52019)	(0.01071)	(2.22670)	

Log likelihood 642.4667

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

G8	IN22	CL41	EX15	FF41	C
1.000000	0.000000	-5.907814	-0.103422	26.17163	8.037678
		(1.24549)	(0.00558)	(4.01682)	
0.000000	1.000000	6.069527	-0.060922	-12.58406	-1.199899
		(1.94201)	(0.00871)	(6.26313)	

Log likelihood 672.1345

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

G8	IN22	CL41	EX15	FF41	C
1.000000	0.000000	0.000000	-0.095120	7.192725	8.917014
			(0.00857)	(0.46785)	
0.000000	1.000000	0.000000	-0.069451	6.914357	-2.103306
			(0.00395)	(0.21576)	
0.000000	0.000000	1.000000	0.001405	-3.212509	0.148843
			(0.00092)	(0.05029)	

Log likelihood 694.4924

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

G8	IN22	CL41	EX15	FF41	C
1.000000	0.000000	0.000000	0.000000	4.563299	7.857664
				(1.51954)	
0.000000	1.000000	0.000000	0.000000	4.994495	-2.876785
				(1.10350)	
0.000000	0.000000	1.000000	0.000000	-3.173663	0.164494
				(0.04880)	
0.000000	0.000000	0.000000	1.000000	-27.64334	-11.13702
				(15.5549)	

Log likelihood 698.5074

	G8	IN22	CL41	EX15	FF41
Mean	-7.422556	3.288431	-0.510826	6.418490	-0.112096
Median	-7.373537	3.377169	-0.498433	6.428573	-0.099449
Maximum	-7.182717	3.650805	-0.140239	10.99625	-0.022822
Minimum	-7.824582	2.658542	-0.845177	2.750790	-0.281095
Std. Dev.	0.184445	0.263943	0.142567	2.381954	0.049740
Skewness	-0.662850	-0.775459	-0.210649	0.124714	-1.544077
Kurtosis	2.337435	2.365314	3.145699	2.005496	6.009272
Jarque-Bera	4.026867	9.360571	0.662399	3.504176	61.97470
Probability	0.133529	0.009276	0.718062	0.173411	0.000000
Observations	44	80	80	80	80

42. UK to the IOM
Date: 03/22/98 Time: 19:41
Sample: 1976:1 1995:4
Included observations: 39
Test assumption: Linear deterministic trend in the data

Series: J1 IN21 CL42 EX15 FF42
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.704780	113.2381	68.52	76.07	None **
0.496086	65.65675	47.21	54.46	At most 1 **
0.425568	38.92813	29.68	35.65	At most 2 **
0.263862	17.30756	15.41	20.04	At most 3 *
0.128418	5.360383	3.76	6.65	At most 4 *

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 5 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

J1	IN21	CL42	EX15	FF42
1.763247	12.62589	5.714593	-0.508983	18.31332
-0.423012	2.938422	25.16386	0.315495	-66.78878
0.210037	3.902677	-0.552111	-0.095815	7.017160
0.032680	6.318848	5.045050	-0.139962	9.877574
-0.780109	-10.81604	-15.02220	0.463284	11.47221

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

J1	IN21	CL42	EX15	FF42	C
1.000000	7.160591	3.240949	-0.288662	10.38613	-21.42341
	(0.60440)	(1.74962)	(0.01970)	(3.89464)	

Log likelihood 532.5604

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

J1	IN21	CL42	EX15	FF42	C
1.000000	0.000000	-28.59936	-0.520717	85.25706	-0.268908
		(5.35017)	(0.10477)	(16.9349)	
0.000000	1.000000	4.446604	0.032407	-10.45597	-2.954296
		(0.74768)	(0.01464)	(2.36664)	

Log likelihood 545.9248

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

J1	IN21	CL42	EX15	FF42	C
1.000000	0.000000	0.000000	-0.249309	13.35200	4.454474
			(0.14938)	(8.81144)	
0.000000	1.000000	0.000000	-0.009791	0.723765	-3.688683
			(0.02282)	(1.34608)	
0.000000	0.000000	1.000000	0.009490	-2.514219	0.165157
			(0.00546)	(0.32181)	

Log likelihood 556.7350

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

J1	IN21	CL42	EX15	FF42	C
1.000000	0.000000	0.000000	0.000000	-23.78764	-1.487606
				(23.8947)	
0.000000	1.000000	0.000000	0.000000	-0.734809	-3.922045
				(3.78596)	
0.000000	0.000000	1.000000	0.000000	-1.100494	0.391343
				(1.82248)	

0.000000	0.000000	0.000000	1.000000	-148.9702	-23.83418
				(139.733)	

Log likelihood 562.7086

	J1	IN21	CL42	EX15	FF42
Mean	-0.943550	3.770214	-0.541414	6.418490	-0.136463
Median	-0.838784	3.786092	-0.536610	6.428573	-0.117236
Maximum	-0.471205	4.015968	-0.150558	10.99625	-0.022937
Minimum	-3.452048	3.341498	-0.899316	2.750790	-0.340483
Std. Dev.	0.508458	0.160939	0.159395	2.381954	0.073526
Skewness	-3.051316	-0.502361	-0.192945	0.124714	-0.871457
Kurtosis	14.53914	2.438020	2.884772	2.005496	2.925114
Jarque-Bera	312.3887	4.417624	0.540630	3.504176	10.14452
Probability	0.000000	0.109831	0.763139	0.173411	0.006268
Observations	44	80	80	80	80

Specification error was found. We tried with lower lag values;
Date: 03/24/98 Time: 09:29
Sample: 1976:1 1995:4
Included observations: 42
Test assumption: Linear deterministic trend in the data
Series: J1 IN21 CL42 EX15 FF42
Lags interval: 1 to 1

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.595988	84.91467	68.52	76.07	None **
0.408770	46.84965	47.21	54.46	At most 1
0.315344	24.77657	29.68	35.65	At most 2
0.165564	8.865324	15.41	20.04	At most 3
0.029632	1.263337	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

J1	IN21	CL42	EX15	FF42
0.658231	5.782970	2.862667	-0.255098	9.210843
0.124758	4.341789	10.81852	0.016044	-21.60280
0.036406	-1.452961	-10.24615	-0.033649	23.21063
0.064649	-4.653859	-4.454314	0.147895	-4.506874
-0.029644	1.496538	2.433919	-0.129953	-4.585436

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

J1	IN21	CL42	EX15	FF42	C
1.000000	8.785624	4.349032	-0.387550	13.99333	-25.90996
	(1.28074)	(3.00771)	(0.04504)	(6.42221)	

Log likelihood 495.1114

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

J1	IN21	CL42	EX15	FF42	C
1.000000	0.000000	-23.46632	-0.561857	77.19430	1.780145
		(7.38826)	(0.18544)	(25.3689)	
0.000000	1.000000	3.166008	0.019840	-7.193681	-3.151752
		(0.75420)	(0.01893)	(2.58969)	

Log likelihood 506.1480

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

J1	IN21	CL42	EX15	FF42	C
1.000000	0.000000	0.000000	-0.638413	28.47582	9.059563
			(0.56264)	(28.6319)	
0.000000	1.000000	0.000000	0.030169	-0.620725	-4.133869
			(0.07171)	(3.64913)	
0.000000	0.000000	1.000000	-0.003262	-2.076102	0.310207
			(0.01907)	(0.97046)	

Log likelihood 514.1036

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

J1	IN21	CL42	EX15	FF42	C
1.000000	0.000000	0.000000	0.000000	-8.981793	0.049691
				(6.31160)	
0.000000	1.000000	0.000000	0.000000	1.149363	-3.708101
				(1.08708)	
0.000000	0.000000	1.000000	0.000000	-2.267516	0.264165
				(0.38782)	
0.000000	0.000000	0.000000	1.000000	-58.67302	-14.11292
				(23.7573)	

Log likelihood 517.9046

---

43. EIRE to the IOM
Date: 03/22/98 Time: 19:43
Sample: 1976:1 1995:4
Included observations: 39
Test assumption: Linear deterministic trend in the data
Series: J2 IN6 CL43 EX43 FF43
Lags interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.644721	102.9036	68.52	76.07	None **
0.530902	62.54440	47.21	54.46	At most 1 **
0.393876	33.02361	29.68	35.65	At most 2 *
0.291477	13.49742	15.41	20.04	At most 3
0.001514	0.059084	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 3 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

J2	IN6	CL43	EX43	FF43
-1.669932	-2.581978	6.884041	4.333572	8.695478
-0.666969	-4.748073	8.180440	15.20445	12.58131
-0.700925	0.658456	-3.780840	-3.946333	-9.546707
1.103626	1.390024	2.254260	-3.833610	-1.157320
-0.194470	3.019976	-4.978375	-6.885657	-10.14637

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

J2	IN6	CL43	EX43	FF43	C
1.000000	1.546157	-4.122348	-2.595059	-5.207085	-2.026870
	(0.37650)	(0.88245)	(1.17036)	(1.42842)	

Log likelihood 513.0247

Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)

J2	IN6	CL43	EX43	FF43	C
1.000000	0.000000	-1.863134	3.009805	-1.418123	3.395939
		(0.84145)	(0.56703)	(1.12249)	
0.000000	1.000000	-1.461180	-3.625028	-2.450567	-3.507281
		(0.32364)	(0.21809)	(0.43173)	

Log likelihood 527.7851

Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)

J2	IN6	CL43	EX43	FF43	C
1.000000	0.000000	0.000000	2.761258	2.614334	2.714058
			(0.52319)	(1.10941)	
0.000000	1.000000	0.000000	-3.819954	0.711923	-4.042053
			(0.48624)	(1.03105)	
0.000000	0.000000	1.000000	-0.133403	2.164340	-0.365986
			(0.25380)	(0.53817)	

Log likelihood 537.5482

Normalized Cointegrating Coefficients: 4 Cointegrating Equation(s)

J2	IN6	CL43	EX43	FF43	C
1.000000	0.000000	0.000000	0.000000	-18.92703	11.50284
				(30.2697)	
0.000000	1.000000	0.000000	0.000000	30.51247	-16.20055
				(47.0640)	
0.000000	0.000000	1.000000	0.000000	3.205055	-0.790593
				(3.30317)	
0.000000	0.000000	0.000000	1.000000	7.801285	-3.182891
				(11.6261)	

Log likelihood 544.2674

	J2	IN6	CL43	EX43	FF43
Mean	-3.562204	3.359158	-0.537918	-0.092243	0.424549
Median	-3.553887	3.372912	-0.543020	-0.084877	0.406536
Maximum	-1.435882	3.838486	-0.210116	0.074779	0.700814
Minimum	-6.238881	2.638741	-0.759144	-0.255326	0.122848
Std. Dev.	1.230851	0.278141	0.126819	0.085549	0.113763
Skewness	-0.183626	-0.493007	0.492975	-0.215468	0.197915
Kurtosis	2.439846	2.606470	3.061307	1.893484	3.381227
Jarque-Bera	0.822517	3.756963	3.252847	4.700281	1.006715
Probability	0.662816	0.152822	0.196632	0.095356	0.604498
Observations	44	80	80	80	80

4. VEC ESTIMATION (ECM)

4. 1 GERMANY TO MALTA

VEC ESTIMATION (1-lag)

Sample(adjusted): 1976:4 1995:4
Included observations: 77 after adjusting endpoints
Standard errors & t-statistics in parentheses

Cointegrating Eq:	CointEq1
D(W3(-1))	1.000000
D(IN4(-1))	-0.650360
	(0.31211)
	(-2.08378)
D(CL10(-1))	2.490327
	(0.90849)
	(2.74117)
D(EX10(-1))	0.927037
	(0.61292)
	(1.51250)
D(FF10(-1))	0.867429
	(2.37023)
	(0.36597)
C	-0.033793

Error Correction:	D(W3,2)	D(IN4,2)	D(CL10,2)	D(EX10,2)	D(FF10,2)
CointEq1	-1.917947	-0.064471	-0.058383	0.082079	0.000494
	(0.13747)	(0.09571)	(0.06547)	(0.10809)	(0.00894)
	(-13.9516)	(-0.67361)	(-0.89172)	(0.75937)	(0.05524)
D(W3(-1),2)	0.618789	0.034866	0.051640	-0.095535	0.000497
	(0.08688)	(0.06049)	(0.04138)	(0.06831)	(0.00565)
	(7.12238)	(0.57642)	(1.24805)	(-1.39855)	(0.08804)
D(IN4(-1),2)	-0.729681	-0.812164	-0.061357	0.137182	0.025174
	(0.17035)	(0.11860)	(0.08113)	(0.13394)	(0.01107)
	(-4.28336)	(-6.84785)	(-0.75627)	(1.02420)	(2.27352)
D(CL10(-1),2)	3.576512	0.129581	-0.498847	0.311841	-0.014532
	(1.21032)	(0.84264)	(0.57643)	(0.95163)	(0.07867)
	(2.95501)	(0.15378)	(-0.86542)	(0.32769)	(-0.18473)
D(EX10(-1),2)	1.379565	-0.325675	-0.125420	-0.094034	0.004142
	(0.75665)	(0.52679)	(0.36036)	(0.59493)	(0.04918)
	(1.82324)	(-0.61822)	(-0.34804)	(-0.15806)	(0.08421)
D(FF10(-1),2)	-0.617578	1.806798	0.088003	-0.223863	-0.472505
	(2.36162)	(1.64419)	(1.12474)	(1.85685)	(0.15350)
	(-0.26151)	(1.09890)	(0.07824)	(-0.12056)	(-3.07820)

C	0.008309	-0.000435	-0.000165	6.87E-05	-0.000179
	(0.01992)	(0.01387)	(0.00949)	(0.01566)	(0.00129)
	(0.41712)	(-0.03136)	(-0.01743)	(0.00439)	(-0.13828)
R-squared	0.775403	0.472320	0.170405	0.180182	0.345579
Adj. R-squared	0.756151	0.427091	0.099297	0.109912	0.289486
Sum sq. resids	2.135293	1.035000	0.484330	1.320054	0.009021
S.E. equation	0.174654	0.121597	0.083181	0.137324	0.011352
Log likelihood	28.77227	56.65406	85.89057	47.28812	239.2440
Akaike AIC	-3.403384	-4.127586	-4.886976	-3.884315	-8.870182
Schwarz SC	-3.190310	-3.914513	-4.673903	-3.671241	-8.657109
Mean dependent	0.003281	0.000195	-0.000503	0.000705	-0.000210
S.D. dependent	0.353687	0.160649	0.087646	0.145556	0.013468

Determinant Residual Covariance	5.99E-14
Log Likelihood	818.4061
Akaike Information Criteria	-30.23890
Schwarz Criteria	-29.99538

VEC ESTIMATION (2-lags)

Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints
Standard errors & t-statistics in parentheses

Cointegrating Eq:	CointEq1
D(W3(-1))	1.000000
D(IN4(-1))	1.772599
	(0.39546)
	(4.48234)
D(CL10(-1))	3.149345
	(0.80715)
	(3.90179)
D(EX10(-1))	2.992425
	(0.60134)
	(4.97624)
D(FF10(-1))	-4.907623
	(2.19894)
	(-2.23181)
C	-0.042500

Error Correction:	D(W3,2)	D(IN4,2)	D(CL10,2)	D(EX10,2)	D(FF10,2)
CointEq1	-1.970935	-0.531310	-0.168000	0.220793	0.004275
	(0.24702)	(0.13117)	(0.09257)	(0.15361)	(0.01342)
	(-7.97896)	(-4.05062)	(-1.81490)	(1.43740)	(0.31855)
D(W3(-1),2)	0.713818	0.339403	0.137616	-0.203730	-0.003027
	(0.17017)	(0.09036)	(0.06377)	(0.10582)	(0.00925)
	(4.19481)	(3.75613)	(2.15807)	(-1.92529)	(-0.32736)
D(W3(-2),2)	0.141936	0.210520	0.089572	-0.125740	-0.002112

	(0.11430)	(0.06070)	(0.04283)	(0.07108)	(0.00621)
	(1.24174)	(3.46841)	(2.09112)	(-1.76900)	(-0.34005)
D(IN4(-1),2)	2.848727	-0.333481	0.149373	-0.167012	0.012728
	(0.42307)	(0.22465)	(0.15854)	(0.26308)	(0.02299)
	(6.73345)	(-1.48442)	(0.94217)	(-0.63482)	(0.55372)
D(IN4(-2),2)	1.541028	-0.124945	-0.013727	-0.002962	-0.017244
	(0.31403)	(0.16675)	(0.11768)	(0.19528)	(0.01706)
	(4.90727)	(-0.74928)	(-0.11664)	(-0.01517)	(-1.01062)
D(CL10(-1),2)	4.464515	1.378179	-0.168960	-0.236006	0.002260
	(1.49584)	(0.79430)	(0.56055)	(0.93018)	(0.08128)
	(2.98461)	(1.73508)	(-0.30142)	(-0.25372)	(0.02781)
D(CL10(-2),2)	1.054864	0.874409	-0.183240	-0.356601	-0.025598
	(1.44885)	(0.76935)	(0.54294)	(0.90096)	(0.07872)
	(0.72807)	(1.13656)	(-0.33750)	(-0.39580)	(-0.32517)
D(EX10(-1),2)	4.570997	0.879525	0.367051	-0.872578	0.003134
	(1.00995)	(0.53629)	(0.37847)	(0.62803)	(0.05488)
	(4.52596)	(1.64001)	(0.96983)	(-1.38938)	(0.05711)
D(EX10(-2),2)	1.755171	0.692385	0.186529	-0.757983	-0.042753
	(0.90729)	(0.48178)	(0.34000)	(0.56420)	(0.04930)
	(1.93451)	(1.43714)	(0.54862)	(-1.34347)	(-0.86724)
D(FF10(-1),2)	-11.80397	-0.737936	-1.024783	1.162755	-0.634299
	(3.17753)	(1.68729)	(1.19075)	(1.97593)	(0.17265)
	(-3.71483)	(-0.43735)	(-0.86062)	(0.58846)	(-3.67391)
D(FF10(-2),2)	-4.591606	-2.619275	-0.919074	1.572432	-0.281744
	(2.99571)	(1.59074)	(1.12261)	(1.86287)	(0.16277)
	(-1.53273)	(-1.64657)	(-0.81869)	(0.84409)	(-1.73093)
C	0.009524	0.000569	-0.000183	0.000389	-0.000144
	(0.02189)	(0.01162)	(0.00820)	(0.01361)	(0.00119)
	(0.43518)	(0.04896)	(-0.02227)	(0.02861)	(-0.12073)
R-squared	0.755310	0.665829	0.441517	0.442508	0.490642
Adj. R-squared	0.713254	0.608393	0.345528	0.346689	0.403096
Sum sq. resids	2.321289	0.654532	0.325978	0.897623	0.006853
S.E. equation	0.190447	0.101129	0.071368	0.118429	0.010348
Log likelihood	24.72814	72.83455	99.32401	60.83301	246.0855
Akaike AIC	-3.172821	-4.438779	-5.135870	-4.122949	-8.998014
Schwarz SC	-2.804811	-4.070769	-4.767860	-3.754939	-8.630004
Mean dependent	0.005154	-0.000490	-0.000353	0.000816	2.76E-05
S.D. dependent	0.355653	0.161603	0.088218	0.146520	0.013394

Determinant Residual Covariance	1.83E-14
Log Likelihood	852.8363
Akaike Information Criteria	-31.29034
Schwarz Criteria	-30.89166

VEC ESTIMATION (3-lags)

Sample(adjusted): 1977:3 1995:4

Included observations: 74 after adjusting endpoints
Standard errors & t-statistics in parentheses

Cointegrating Eq: CointEq1

D(W3(-2))	1.000000
D(IN4(-2))	-1.901527 (0.54081) (-3.51605)
D(CL10(-2))	2.718782 (0.82006) (3.31533)
D(EX10(-2))	0.292924 (0.67179) (0.43604)
D(FF10(-2))	-1.471664 (2.36112) (-0.62329)
C	-0.034962

Error Correction:	D(W3(-1),2)	D(IN4(-1),2)	D(CL10(-1),2)	D(EX10(-1),2)	D(FF10(-1),2)
CointEq1	-2.174809 (0.39944) (-5.44468)	0.371482 (0.20280) (1.83175)	-0.042989 (0.16082) (-0.26731)	0.091513 (0.26826) (0.34113)	0.021346 (0.02406) (0.88712)
D(W3(-2),2)	0.754194 (0.31535) (2.39161)	-0.292656 (0.16011) (-1.82786)	0.044098 (0.12696) (0.34733)	-0.104436 (0.21179) (-0.49311)	-0.017131 (0.01900) (-0.90177)
D(W3(-3),2)	0.140681 (0.21025) (0.66910)	-0.179275 (0.10675) (-1.67941)	0.040621 (0.08465) (0.47986)	-0.075602 (0.14121) (-0.53540)	-0.012108 (0.01267) (-0.95595)
D(W3(-4),2)	-0.088829 (0.12171) (-0.72984)	-0.138492 (0.06179) (-2.24117)	-0.024450 (0.04900) (-0.49896)	0.026894 (0.08174) (0.32901)	-0.003296 (0.00733) (-0.44951)
D(IN4(-2),2)	-2.914934 (0.66749) (-4.36704)	-0.611183 (0.33889) (-1.80346)	-0.157227 (0.26874) (-0.58505)	0.276472 (0.44829) (0.61673)	0.049510 (0.04021) (1.23131)
D(IN4(-3),2)	-1.724733 (0.53640) (-3.21537)	-0.737543 (0.27234) (-2.70816)	-0.302019 (0.21596) (-1.39847)	0.409027 (0.36025) (1.13540)	0.016643 (0.03231) (0.51504)
D(IN4(-4),2)	-1.123633 (0.32559) (-3.45109)	-0.679418 (0.16531) (-4.11004)	-0.227216 (0.13109) (-1.73333)	0.319603 (0.21867) (1.46160)	0.016362 (0.01961) (0.83425)
D(CL10(-2),2)	5.273272 (1.68602) (3.12765)	-0.723098 (0.85602) (-0.84472)	-0.520654 (0.67881) (-0.76700)	-0.037792 (1.13234) (-0.03337)	-0.046473 (0.10157) (-0.45757)

D(CL10(-3),2)	1.567070	-0.557891	-0.510067	-0.078320	-0.044159
	(1.63739)	(0.83133)	(0.65924)	(1.09968)	(0.09864)
	(0.95705)	(-0.67108)	(-0.77372)	(-0.07122)	(-0.44769)
D(CL10(-4),2)	0.591441	-0.170271	-0.018935	-0.450338	-0.035009
	(1.48368)	(0.75329)	(0.59735)	(0.99645)	(0.08938)
	(0.39863)	(-0.22604)	(-0.03170)	(-0.45194)	(-0.39170)
D(EX10(-2),2)	1.058101	-0.329111	0.058444	-0.625903	0.001243
	(0.91904)	(0.46661)	(0.37002)	(0.61723)	(0.05536)
	(1.15132)	(-0.70532)	(0.15795)	(-1.01405)	(0.02246)
D(EX10(-3),2)	-0.280487	-0.346736	-0.079282	-0.501494	-0.026946
	(0.93321)	(0.47381)	(0.37572)	(0.62675)	(0.05622)
	(-0.30056)	(-0.73181)	(-0.21101)	(-0.80015)	(-0.47931)
D(EX10(-4),2)	-0.343589	-0.306549	0.001566	-0.340260	-0.004888
	(0.90561)	(0.45979)	(0.36461)	(0.60821)	(0.05455)
	(-0.37940)	(-0.66671)	(0.00430)	(-0.55944)	(-0.08960)
D(FF10(-2),2)	-7.323645	0.913941	-0.516555	0.531584	-0.704417
	(3.06721)	(1.55728)	(1.23490)	(2.05996)	(0.18477)
	(-2.38772)	(0.58688)	(-0.41830)	(0.25806)	(-3.81241)
D(FF10(-3),2)	-3.365625	0.314858	-0.426482	0.727604	-0.436815
	(3.50471)	(1.77940)	(1.41105)	(2.35378)	(0.21112)
	(-0.96032)	(0.17695)	(-0.30225)	(0.30912)	(-2.06899)
D(FF10(-4),2)	-0.787597	0.606497	-0.304013	0.611608	-0.186808
	(3.00714)	(1.52678)	(1.21072)	(2.01961)	(0.18115)
	(-0.26191)	(0.39724)	(-0.25110)	(0.30283)	(-1.03123)
C	-0.009004	-1.51E-05	-0.000885	0.000588	-4.85E-05
	(0.02041)	(0.01037)	(0.00822)	(0.01371)	(0.00123)
	(-0.44105)	(-0.00146)	(-0.10771)	(0.04289)	(-0.03942)
R-squared	0.813147	0.763138	0.513840	0.509295	0.528956
Adj. R-squared	0.760697	0.696650	0.377374	0.371553	0.396733
Sum sq. resids	1.745797	0.450027	0.282991	0.787450	0.006335
S.E. equation	0.175009	0.088855	0.070461	0.117537	0.010543
Log likelihood	33.63241	83.79177	100.9558	63.09057	241.5291
Akaike AIC	-3.287395	-4.643053	-5.106946	-4.083561	-8.906224
Schwarz SC	-2.758082	-4.113741	-4.577634	-3.554249	-8.376911
Mean dependent	-0.001303	-0.000192	-0.000765	0.000336	3.02E-06
S.D. dependent	0.357754	0.161328	0.089297	0.148265	0.013573

Determinant Residual Covariance	6.61E-15
Log Likelihood	868.0627
Akaike Information Criteria	-32.16405
Schwarz Criteria	-31.60360

VEC ESTIMATION (4-lags)

Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints
Standard errors & t-statistics in parentheses

Cointegrating Eq:	CointEq1
D(W3(-1))	1.000000
D(IN4(-1))	-4.085252 (1.05434) (-3.87471)
D(CL10(-1))	1.708070 (1.06114) (1.60966)
D(EX10(-1))	-2.171384 (1.16092) (-1.87040)
D(FF10(-1))	-0.692860 (3.15481) (-0.21962)
C	-0.025712

Error Correction:	D(W3,2)	D(IN4,2)	D(CL10,2)	D(EX10,2)	D(FF10,2)
CointEq1	-1.156143 (0.33784) (-3.42214)	0.164378 (0.16946) (0.97003)	-0.221605 (0.13499) (-1.64159)	0.504850 (0.22149) (2.27935)	0.055295 (0.01869) (2.95910)
D(W3(-1),2)	-0.223277 (0.30371) (-0.73517)	-0.135207 (0.15234) (-0.88756)	0.218783 (0.12136) (1.80283)	-0.482152 (0.19911) (-2.42154)	-0.044889 (0.01680) (-2.67218)
D(W3(-2),2)	-0.653203 (0.25005) (-2.61231)	-0.075679 (0.12542) (-0.60341)	0.179220 (0.09991) (1.79375)	-0.371109 (0.16393) (-2.26381)	-0.034978 (0.01383) (-2.52904)
D(W3(-3),2)	-0.630383 (0.17540) (-3.59391)	-0.093461 (0.08798) (-1.06231)	0.068889 (0.07009) (0.98290)	-0.156710 (0.11499) (-1.36277)	-0.016699 (0.00970) (-1.72118)
D(W3(-4),2)	-0.308882 (0.11719) (-2.63567)	0.018794 (0.05878) (0.31973)	0.060672 (0.04683) (1.29565)	-0.108115 (0.07683) (-1.40717)	-0.005297 (0.00648) (-0.81715)
D(IN4(-1),2)	-3.763849 (1.23572) (-3.04588)	-0.777947 (0.61982) (-1.25512)	-0.845635 (0.49377) (-1.71262)	1.943636 (0.81013) (2.39915)	0.236727 (0.06835) (3.46347)
D(IN4(-2),2)	-2.670416 (0.98979) (-2.69796)	-0.925520 (0.49646) (-1.86423)	-0.806058 (0.39550) (-2.03808)	1.675955 (0.64890) (2.58275)	0.172306 (0.05475) (3.14732)
D(IN4(-3),2)	-1.920342 (0.71780) (-2.67532)	-0.830785 (0.36004) (-2.30750)	-0.489657 (0.28682) (-1.70722)	1.081270 (0.47059) (2.29771)	0.142324 (0.03970) (3.58475)
D(IN4(-4),2)	-0.617514 (0.43790)	-0.180478 (0.21964)	-0.085994 (0.17497)	0.347786 (0.28708)	0.078891 (0.02422)

	(-1.41018)	(-0.82169)	(-0.49147)	(1.21144)	(3.25718)
D(CL10(-1),2)	2.171277	-0.009395	-0.409651	-0.481981	-0.059042
	(1.78153)	(0.89358)	(0.71186)	(1.16796)	(0.09854)
	(1.21877)	(-0.01051)	(-0.57547)	(-0.41267)	(-0.59917)
D(CL10(-2),2)	-0.058768	0.014629	-0.452725	-0.562541	-0.107983
	(1.79750)	(0.90160)	(0.71824)	(1.17844)	(0.09942)
	(-0.03269)	(0.01623)	(-0.63032)	(-0.47736)	(-1.08610)
D(CL10(-3),2)	0.198702	0.294104	0.064542	-0.907601	-0.080393
	(1.80161)	(0.90366)	(0.71988)	(1.18113)	(0.09965)
	(0.11029)	(0.32546)	(0.08966)	(-0.76842)	(-0.80676)
D(CL10(-4),2)	1.887312	0.272917	-0.376196	0.155546	-0.070020
	(1.56395)	(0.78445)	(0.62492)	(1.02532)	(0.08650)
	(1.20676)	(0.34791)	(-0.60199)	(0.15170)	(-0.80943)
D(EX10(-1),2)	-1.593411	0.086846	-0.453944	0.458652	0.139098
	(1.27305)	(0.63854)	(0.50868)	(0.83460)	(0.07041)
	(-1.25165)	(0.13601)	(-0.89239)	(0.54954)	(1.97543)
D(EX10(-2),2)	-2.093492	0.010786	-0.477260	0.239731	0.055492
	(1.18418)	(0.59397)	(0.47317)	(0.77635)	(0.06550)
	(-1.76788)	(0.01816)	(-1.00864)	(0.30879)	(0.84721)
D(EX10(-3),2)	-1.295866	0.002771	-0.173878	0.000811	0.065195
	(1.16662)	(0.58516)	(0.46616)	(0.76483)	(0.06453)
	(-1.11079)	(0.00474)	(-0.37300)	(0.00106)	(1.01034)
D(EX10(-4),2)	0.647948	0.201504	-0.342618	0.425823	0.022724
	(1.00828)	(0.50574)	(0.40289)	(0.66102)	(0.05577)
	(0.64263)	(0.39844)	(-0.85041)	(0.64419)	(0.40746)
D(FF10(-1),2)	-6.197936	-0.011560	-0.457663	0.476823	-0.834853
	(3.45383)	(1.73239)	(1.38007)	(2.26432)	(0.19104)
	(-1.79451)	(-0.00667)	(-0.33162)	(0.21058)	(-4.37011)
D(FF10(-2),2)	-5.299432	-1.214618	-0.794842	1.758372	-0.483283
	(3.95831)	(1.98542)	(1.58165)	(2.59505)	(0.21894)
	(-1.33881)	(-0.61177)	(-0.50254)	(0.67759)	(-2.20737)
D(FF10(-3),2)	-3.217926	-1.229969	-1.183443	2.202215	-0.344369
	(3.89142)	(1.95188)	(1.55493)	(2.55120)	(0.21524)
	(-0.82693)	(-0.63015)	(-0.76109)	(0.86321)	(-1.59992)
D(FF10(-4),2)	-6.154898	-2.249391	-0.649160	1.566413	-0.095476
	(3.17106)	(1.59055)	(1.26709)	(2.07894)	(0.17540)
	(-1.94096)	(-1.41422)	(-0.51233)	(0.75347)	(-0.54434)
C	-0.004553	-0.000637	-0.002126	0.002879	0.000153
	(0.02069)	(0.01038)	(0.00827)	(0.01356)	(0.00114)
	(-0.22010)	(-0.06143)	(-0.25722)	(0.21229)	(0.13376)
R-squared	0.825221	0.784862	0.551787	0.561347	0.627613
Adj. R-squared	0.754637	0.697979	0.370777	0.384199	0.477226
Sum sq. resids	1.636587	0.411743	0.261302	0.703417	0.005007
S.E. equation	0.177406	0.088984	0.070887	0.116307	0.009813
Log likelihood	36.02254	87.08139	103.9062	67.26604	250.2357

Akaike AIC	-3.216858	-4.596827	-5.051550	-4.061276	-9.006401
Schwarz SC	-2.531865	-3.911834	-4.366558	-3.376284	-8.321409
Mean dependent	-0.000899	0.000513	-0.000579	0.000540	2.62E-05
S.D. dependent	0.358148	0.161917	0.089365	0.148212	0.013571

Determinant Residual Covariance	3.08E-15
Log Likelihood	896.2916
Akaike Information Criteria	-32.79186
Schwarz Criteria	-32.07573

4. 2. UK TO MALTA:

VEC ESTIMATION (1-lag)

Sample(adjusted): 1976:4 1995:4
Included observations: 77 after adjusting endpoints
Standard errors & t-statistics in parentheses

Cointegrating Eq:	CointEq1
D(Z1(-1))	1.000000
D(IN2(-1))	-0.077414
	(0.29257)
	(-0.26460)
D(CL1(-1))	-0.585195
	(0.36486)
	(-1.60388)
D(EX1(-1))	0.196701
	(0.66092)
	(0.29762)
D(FF1(-1))	2.050340
	(0.88618)
	(2.31368)
C	0.005469

Error Correction:	D(Z1,2)	D(IN2,2)	D(CL1,2)	D(EX1,2)	D(FF1,2)
CointEq1	-1.967210	0.025041	0.057435	0.012153	0.002272
	(0.13247)	(0.08210)	(0.05837)	(0.01753)	(0.02228)
	(-14.8502)	(0.30501)	(0.98402)	(0.69325)	(0.10196)
D(Z1(-1),2)	0.654838	-0.046371	-0.031233	-0.002142	0.016965
	(0.08577)	(0.05315)	(0.03779)	(0.01135)	(0.01443)
	(7.63486)	(-0.87239)	(-0.82647)	(-0.18868)	(1.17594)
D(IN2(-1),2)	0.007640	-0.724397	0.061240	0.026812	0.099255
	(0.18877)	(0.11699)	(0.08317)	(0.02498)	(0.03175)

	(0.04048)	(-6.19222)	(0.73631)	(1.07337)	(3.12597)
D(CL1(-1),2)	-1.289213	0.524650	-0.352187	0.009609	-0.056823
	(0.42697)	(0.26461)	(0.18813)	(0.05650)	(0.07182)
	(-3.01945)	(1.98274)	(-1.87209)	(0.17007)	(-0.79120)
D(EX1(-1),2)	0.469765	-0.376379	-0.234143	-0.478587	0.033333
	(0.75140)	(0.46567)	(0.33107)	(0.09943)	(0.12639)
	(0.62519)	(-0.80825)	(-0.70723)	(-4.81314)	(0.26373)
D(FF1(-1),2)	3.789050	-0.256489	-0.272492	-0.035202	-0.508191
	(0.80267)	(0.49745)	(0.35366)	(0.10622)	(0.13501)
	(4.72055)	(-0.51561)	(-0.77049)	(-0.33141)	(-3.76396)
C	0.007155	-0.002339	-0.000778	-0.001535	0.000528
	(0.02031)	(0.01259)	(0.00895)	(0.00269)	(0.00342)
	(0.35227)	(-0.18586)	(-0.08694)	(-0.57100)	(0.15459)
R-squared	0.787245	0.408560	0.198998	0.279306	0.481175
Adj. R-squared	0.769009	0.357866	0.130340	0.217532	0.436704
Sum sq. resids	2.220552	0.852858	0.431084	0.038885	0.062827
S.E. equation	0.178107	0.110380	0.078475	0.023569	0.029959
Log likelihood	27.26491	64.10625	90.37440	182.9934	164.5221
Akaike AIC	-3.364231	-4.321149	-5.003439	-7.409127	-6.929353
Schwarz SC	-3.151158	-4.108076	-4.790366	-7.196054	-6.716280
Mean dependent	0.003683	-0.000246	-0.000897	-0.001493	-7.59E-05
S.D. dependent	0.370582	0.137745	0.084151	0.026645	0.039917

Determinant Residual Covariance	1.35E-13
Log Likelihood	787.0221
Akaike Information Criteria	-29.42373
Schwarz Criteria	-29.18021

VEC ESTIMATION (2-lags)

Sample(adjusted): 1977:1 1995:4
Included observations: 76 after adjusting endpoints
Standard errors & t-statistics in parentheses

Cointegrating Eq:	CointEq1
D(Z1(-1))	1.000000
D(IN2(-1))	0.024105
	(0.11595)
	(0.20789)
D(CL1(-1))	-0.105789
	(0.13426)
	(-0.78792)
D(EX1(-1))	-0.888268
	(0.26206)
	(-3.38952)

D(FF1(-1))	-0.050394				
	(0.34470)				
	(-0.14620)				
C	0.009539				
Error Correction:	D(Z1,2)	D(IN2,2)	D(CL1,2)	D(EX1,2)	D(FF1,2)
CointEq1	-3.592715	0.196103	0.070878	0.075470	0.059005
	(0.16236)	(0.16887)	(0.11342)	(0.03121)	(0.04463)
	(-22.1287)	(1.16127)	(0.62493)	(2.41836)	(1.32200)
D(Z1(-1),2)	1.735291	-0.159398	-0.043833	-0.045795	-0.018178
	(0.10699)	(0.11128)	(0.07474)	(0.02056)	(0.02941)
	(16.2197)	(-1.43241)	(-0.58649)	(-2.22689)	(-0.61806)
D(Z1(-2),2)	0.839273	-0.082028	-0.005982	-0.025412	-0.017986
	(0.07356)	(0.07651)	(0.05139)	(0.01414)	(0.02022)
	(11.4094)	(-1.07211)	(-0.11642)	(-1.79729)	(-0.88941)
D(IN2(-1),2)	0.366650	-0.854352	0.024144	0.047574	0.120879
	(0.15751)	(0.16383)	(0.11003)	(0.03028)	(0.04330)
	(2.32784)	(-5.21501)	(0.21944)	(1.57140)	(2.79166)
D(IN2(-2),2)	0.311907	-0.293307	-0.135316	0.008504	0.001132
	(0.17493)	(0.18195)	(0.12220)	(0.03362)	(0.04809)
	(1.78304)	(-1.61204)	(-1.10732)	(0.25293)	(0.02353)
D(CL1(-1),2)	-0.211342	0.459161	-0.509450	-0.004174	-0.081629
	(0.27282)	(0.28377)	(0.19059)	(0.05244)	(0.07500)
	(-0.77465)	(1.61809)	(-2.67307)	(-0.07959)	(-1.08836)
D(CL1(-2),2)	-0.115474	0.162132	-0.215779	0.057318	-0.027360
	(0.28603)	(0.29751)	(0.19981)	(0.05498)	(0.07863)
	(-0.40371)	(0.54497)	(-1.07990)	(1.04254)	(-0.34795)
D(EX1(-1),2)	-2.690077	-0.263270	-0.178375	-0.689468	0.115106
	(0.55050)	(0.57258)	(0.38456)	(0.10581)	(0.15134)
	(-4.88664)	(-0.45979)	(-0.46384)	(-6.51587)	(0.76059)
D(EX1(-2),2)	-1.532123	-0.512132	-0.166407	-0.467981	0.162829
	(0.48406)	(0.50348)	(0.33815)	(0.09304)	(0.13307)
	(-3.16518)	(-1.01719)	(-0.49211)	(-5.02975)	(1.22361)
D(FF1(-1),2)	-0.928708	-0.262864	-0.286730	-0.160494	-0.714043
	(0.59679)	(0.62073)	(0.41690)	(0.11471)	(0.16406)
	(-1.55618)	(-0.42348)	(-0.68777)	(-1.39911)	(-4.35225)
D(FF1(-2),2)	-0.823411	-0.981233	-0.442431	-0.332122	-0.391007
	(0.52483)	(0.54589)	(0.36663)	(0.10088)	(0.14428)
	(-1.56891)	(-1.79750)	(-1.20674)	(-3.29224)	(-2.71003)
C	0.015700	-0.003002	-0.000736	-0.001877	0.000581
	(0.01151)	(0.01197)	(0.00804)	(0.00221)	(0.00316)
	(1.36430)	(-0.25081)	(-0.09154)	(-0.84849)	(0.18371)
R-squared	0.938595	0.521982	0.418606	0.529818	0.598923
Adj. R-squared	0.928041	0.439823	0.318678	0.449005	0.529988
Sum sq. resids	0.637001	0.689141	0.310859	0.023535	0.048142

S.E. equation	0.099765	0.103768	0.069693	0.019176	0.027427
Log likelihood	73.86619	70.87658	101.1286	199.2009	172.0057
Akaike AIC	-4.465928	-4.387254	-5.183359	-7.764211	-7.048548
Schwarz SC	-4.097917	-4.019243	-4.815349	-7.396200	-6.680537
Mean dependent	0.006973	-0.000487	-0.000123	-0.000676	0.000350
S.D. dependent	0.371911	0.138644	0.084434	0.025834	0.040005

Determinant Residual Covariance	1.42E-14
Log Likelihood	862.3510
Akaike Information Criteria	-31.54073
Schwarz Criteria	-31.14205

VEC ESTIMATION (3-lags)

Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints
Standard errors & t-statistics in parentheses

Cointegrating Eq:	CointEq1
D(Z1(-2))	1.000000
D(IN2(-2))	-0.197350
	(0.15923)
	(-1.23938)
D(CL1(-2))	0.119601
	(0.16622)
	(0.71955)
D(EX1(-2))	-0.974365
	(0.28280)
	(-3.44543)
D(FF1(-2))	-0.150873
	(0.41496)
	(-0.36359)
C	0.006845

Error Correction:	D(Z1(-1),2)	D(IN2(-1),2)	D(CL1(-1),2)	D(EX1(-1),2)	D(FF1(-1),2)
CointEq1	-3.450908	0.821315	0.386020	0.114898	0.161739
	(0.51420)	(0.43734)	(0.34694)	(0.08972)	(0.13573)
	(-6.71125)	(1.87798)	(1.11264)	(1.28063)	(1.19162)
D(Z1(-2),2)	1.633672	-0.595636	-0.283957	-0.073089	-0.098697
	(0.39379)	(0.33493)	(0.26570)	(0.06871)	(0.10395)
	(4.14861)	(-1.77840)	(-1.06873)	(-1.06372)	(-0.94950)
D(Z1(-3),2)	0.753397	-0.394279	-0.175731	-0.049337	-0.068665
	(0.26299)	(0.22368)	(0.17745)	(0.04589)	(0.06942)
	(2.86472)	(-1.76268)	(-0.99034)	(-1.07514)	(-0.98912)
D(Z1(-4),2)	-0.049222	-0.179506	-0.095106	-0.008886	-0.029440
	(0.13893)	(0.11816)	(0.09374)	(0.02424)	(0.03667)
	(-0.35430)	(-1.51915)	(-1.01460)	(-0.36656)	(-0.80280)

D(IN2(-2),2)	-0.265655	-0.823493	0.071289	0.071278	0.140641
	(0.17400)	(0.14799)	(0.11740)	(0.03036)	(0.04593)
	(-1.52672)	(-5.56434)	(0.60721)	(2.34767)	(3.06203)
D(IN2(-3),2)	-0.394181	-0.954600	-0.184838	0.032495	0.004309
	(0.24865)	(0.21148)	(0.16777)	(0.04339)	(0.06563)
	(-1.58529)	(-4.51383)	(-1.10174)	(0.74897)	(0.06565)
D(IN2(-4),2)	-0.507776	-0.823755	-0.125602	0.046505	-0.045208
	(0.19408)	(0.16507)	(0.13095)	(0.03386)	(0.05123)
	(-2.61631)	(-4.99030)	(-0.95916)	(1.37328)	(-0.88244)
D(CL1(-2),2)	0.272855	-0.052664	-0.748178	-0.051285	-0.131851
	(0.32145)	(0.27340)	(0.21689)	(0.05609)	(0.08485)
	(0.84883)	(-0.19263)	(-3.44962)	(-0.91436)	(-1.55391)
D(CL1(-3),2)	0.401991	0.046009	-0.461341	-0.018506	-0.071615
	(0.34617)	(0.29443)	(0.23357)	(0.06040)	(0.09138)
	(1.16125)	(0.15626)	(-1.97519)	(-0.30638)	(-0.78373)
D(CL1(-4),2)	0.596918	0.274341	-0.187339	-0.130664	-0.003463
	(0.31733)	(0.26990)	(0.21411)	(0.05537)	(0.08376)
	(1.88106)	(1.01646)	(-0.87497)	(-2.35984)	(-0.04134)
D(EX1(-2),2)	-2.837706	0.720158	-0.068696	-0.623530	0.141356
	(0.78028)	(0.66365)	(0.52647)	(0.13615)	(0.20597)
	(-3.63679)	(1.08515)	(-0.13048)	(-4.57981)	(0.68631)
D(EX1(-3),2)	-1.596710	0.787880	-0.075173	-0.389665	0.197180
	(0.80248)	(0.68253)	(0.54145)	(0.14002)	(0.21183)
	(-1.98973)	(1.15435)	(-0.13884)	(-2.78290)	(0.93086)
D(EX1(-4),2)	-0.540933	0.257057	-0.056985	-0.016376	0.093931
	(0.62614)	(0.53255)	(0.42247)	(0.10925)	(0.16528)
	(-0.86391)	(0.48269)	(-0.13488)	(-0.14989)	(0.56831)
D(FF1(-2),2)	-0.590031	0.805750	-0.048382	-0.045803	-0.774363
	(0.70367)	(0.59849)	(0.47478)	(0.12278)	(0.18574)
	(-0.83850)	(1.34630)	(-0.10190)	(-0.37305)	(-4.16896)
D(FF1(-3),2)	-0.146221	1.165969	0.013681	-0.147009	-0.460009
	(0.80720)	(0.68654)	(0.54463)	(0.14084)	(0.21307)
	(-0.18115)	(1.69832)	(0.02512)	(-1.04377)	(-2.15894)
D(FF1(-4),2)	0.100823	0.991536	0.171698	0.279385	-0.184608
	(0.65308)	(0.55546)	(0.44064)	(0.11395)	(0.17239)
	(0.15438)	(1.78507)	(0.38965)	(2.45176)	(-1.07088)
C	-0.001573	-0.001879	0.000165	-0.000768	0.000613
	(0.01202)	(0.01022)	(0.00811)	(0.00210)	(0.00317)
	(-0.13094)	(-0.18384)	(0.02033)	(-0.36614)	(0.19314)
R-squared	0.940877	0.693228	0.484682	0.618148	0.642144
Adj. R-squared	0.924281	0.607117	0.340032	0.510961	0.541693
Sum sq. resids	0.604620	0.437381	0.275252	0.018408	0.042128
S.E. equation	0.102992	0.087598	0.069491	0.017971	0.027186
Log likelihood	72.86594	84.84643	101.9818	202.0633	171.4294
Akaike AIC	-4.347760	-4.671557	-5.134675	-7.839581	-7.011638

Schwarz SC	-3.818448	-4.142245	-4.605363	-7.310269	-6.482326
Mean dependent	0.000162	-0.000317	-9.34E-05	-8.26E-05	-0.000264
S.D. dependent	0.374284	0.139753	0.085539	0.025698	0.040158

Determinant Residual Covariance	5.28E-15
Log Likelihood	876.3722
Akaike Information Criteria	-32.38863
Schwarz Criteria	-31.82819

VEC ESTIMATION (4-lags)

Sample(adjusted): 1977:3 1995:4
Included observations: 74 after adjusting endpoints
Standard errors & t-statistics in parentheses

Cointegrating Eq:	CointEq1
D(Z1(-1))	1.000000
D(IN2(-1))	0.220961
	(0.39477)
	(0.55973)
D(CL1(-1))	-2.446777
	(0.92492)
	(-2.64540)
D(EX1(-1))	-0.176127
	(0.71836)
	(-0.24518)
D(FF1(-1))	6.873988
	(2.62842)
	(2.61525)
C	0.005965

Error Correction:	D(Z1,2)	D(IN2,2)	D(CL1,2)	D(EX1,2)	D(FF1,2)
CointEq1	-0.080960	0.258465	0.531632	0.116523	-0.035014
	(0.32863)	(0.23667)	(0.18644)	(0.04805)	(0.07546)
	(-0.24636)	(1.09207)	(2.85151)	(2.42482)	(-0.46404)
D(Z1(-1),2)	-1.426441	-0.122306	-0.436491	-0.084873	0.068553
	(0.31278)	(0.22526)	(0.17745)	(0.04574)	(0.07182)
	(-4.56052)	(-0.54295)	(-2.45981)	(-1.85568)	(0.95455)
D(Z1(-2),2)	-1.491608	-0.099501	-0.327693	-0.071597	0.040979
	(0.25880)	(0.18639)	(0.14683)	(0.03784)	(0.05942)
	(-5.76349)	(-0.53384)	(-2.23185)	(-1.89189)	(0.68961)
D(Z1(-3),2)	-1.441330	-0.007472	-0.185766	-0.026531	0.037175
	(0.18072)	(0.13015)	(0.10253)	(0.02643)	(0.04149)
	(-7.97558)	(-0.05741)	(-1.81189)	(-1.00397)	(0.89590)
D(Z1(-4),2)	-0.581099	0.044628	-0.060026	-0.017141	0.017431

	(0.13031) (-4.45946)	(0.09385) (0.47555)	(0.07393) (-0.81197)	(0.01905) (-0.89958)	(0.02992) (0.58261)
D(IN2(-1),2)	0.139818 (0.24891) (0.56173)	-0.730638 (0.17926) (-4.07586)	0.219117 (0.14121) (1.55170)	0.055040 (0.03640) (1.51222)	0.213716 (0.05715) (3.73950)
D(IN2(-2),2)	-0.260109 (0.33468) (-0.77718)	-0.794694 (0.24104) (-3.29700)	-0.010192 (0.18987) (-0.05368)	0.008866 (0.04894) (0.18116)	0.105635 (0.07685) (1.37463)
D(IN2(-3),2)	-0.640684 (0.35940) (-1.78267)	-0.469456 (0.25883) (-1.81373)	0.193716 (0.20390) (0.95008)	0.033283 (0.05255) (0.63332)	0.123661 (0.08252) (1.49854)
D(IN2(-4),2)	-0.269586 (0.29725) (-0.90694)	0.367199 (0.21408) (1.71527)	0.338128 (0.16864) (2.00506)	-0.000319 (0.04347) (-0.00735)	0.135642 (0.06825) (1.98740)
D(CL1(-1),2)	-0.172988 (0.65571) (-0.26382)	0.234732 (0.47224) (0.49707)	-0.007676 (0.37200) (-0.02063)	0.128281 (0.09588) (1.33790)	-0.236974 (0.15056) (-1.57399)
D(CL1(-2),2)	0.014684 (0.59260) (0.02478)	0.305833 (0.42679) (0.71660)	0.142995 (0.33620) (0.42533)	0.123230 (0.08665) (1.42208)	-0.132484 (0.13607) (-0.97367)
D(CL1(-3),2)	0.149975 (0.50161) (0.29899)	0.292473 (0.36126) (0.80960)	0.044428 (0.28458) (0.15612)	-0.040690 (0.07335) (-0.55474)	-0.097801 (0.11517) (-0.84916)
D(CL1(-4),2)	-0.094340 (0.43263) (-0.21806)	-0.202873 (0.31157) (-0.65112)	-0.080230 (0.24544) (-0.32688)	0.065750 (0.06326) (1.03932)	-0.094571 (0.09934) (-0.95204)
D(EX1(-1),2)	0.009006 (0.87160) (0.01033)	-0.561366 (0.62772) (-0.89430)	-0.746954 (0.49448) (-1.51059)	-0.795796 (0.12745) (-6.24391)	-0.020032 (0.20013) (-0.10010)
D(EX1(-2),2)	0.487581 (1.08184) (0.45069)	-1.113185 (0.77913) (-1.42875)	-1.377996 (0.61376) (-2.24518)	-0.776411 (0.15820) (-4.90792)	-0.104266 (0.24840) (-0.41975)
D(EX1(-3),2)	1.304684 (1.03764) (1.25736)	-1.084369 (0.74730) (-1.45106)	-1.153250 (0.58868) (-1.95905)	-0.375408 (0.15173) (-2.47417)	-0.123431 (0.23825) (-0.51807)
D(EX1(-4),2)	0.731801 (0.74554) (0.98157)	-0.860916 (0.53693) (-1.60340)	-0.463774 (0.42296) (-1.09648)	-0.334854 (0.10902) (-3.07153)	-0.065522 (0.17118) (-0.38276)
D(FF1(-1),2)	0.026140 (1.92233) (0.01360)	-0.507406 (1.38445) (-0.36650)	-2.965976 (1.09059) (-2.71961)	-0.608858 (0.28110) (-2.16600)	-0.675644 (0.44138) (-1.53074)
D(FF1(-2),2)	0.326020 (1.68397) (0.19360)	-0.374481 (1.21278) (-0.30878)	-2.702276 (0.95536) (-2.82854)	-0.566784 (0.24624) (-2.30173)	-0.656811 (0.38665) (-1.69871)

D(FF1(-3),2)	1.045682	-0.615214	-2.061252	-0.023649	-0.551099
	(1.40336)	(1.01069)	(0.79616)	(0.20521)	(0.32222)
	(0.74513)	(-0.60871)	(-2.58899)	(-0.11524)	(-1.71030)
D(FF1(-4),2)	0.111935	-0.901418	-1.161624	-0.197859	-0.321776
	(0.96794)	(0.69710)	(0.54914)	(0.14154)	(0.22225)
	(0.11564)	(-1.29309)	(-2.11535)	(-1.39790)	(-1.44782)
C	-0.002148	-0.000457	-0.000571	-0.001095	0.001104
	(0.01352)	(0.00973)	(0.00767)	(0.00198)	(0.00310)
	(-0.15891)	(-0.04692)	(-0.07443)	(-0.55400)	(0.35569)
R-squared	0.931134	0.748287	0.580894	0.691595	0.678300
Adj. R-squared	0.903322	0.646634	0.411639	0.567047	0.548383
Sum sq. resids	0.692548	0.359207	0.222903	0.014808	0.036511
S.E. equation	0.115405	0.083113	0.065472	0.016875	0.026498
Log likelihood	67.84221	92.13186	109.7869	210.1139	176.7243
Akaike AIC	-4.076849	-4.733326	-5.210489	-7.922030	-7.019608
Schwarz SC	-3.391856	-4.048333	-4.525497	-7.237037	-6.334615
Mean dependent	-0.002408	0.001771	0.000356	-0.000294	0.000588
S.D. dependent	0.371159	0.139816	0.085356	0.025647	0.039430

Determinant Residual Covariance	2.26E-15
Log Likelihood	907.7860
Akaike Information Criteria	-33.10252
Schwarz Criteria	-32.38639

5. FORECASTING RESULTS

5.1 OVERALL FORECASTS
(5 years ahead 1991.1-1995.4)

5.1.1 AUSTRIA INBOUND:

		RMSE	MAE	MAPE	TIC
1. Denmark to Austria					
	AS	0.087	0.069	4.377	0.0213
	DE	0.687			
	HW	0.053			
	ARMA	0.087	0.069	4.084	0.0212
2. France to Austria					
	AS	0.089	0.077	19.231	0.039
	DE	0.724			
	HW	0.035			
	ARMA	0.052	0.045	16.623	0.023
3. UK to Austria					
	AS	0.091	0.069	14.179	0.042
	DE	0.422			
	HW	0.061			
	ARMA	0.073	0.054	9.870	0.034
4. Canada to Austria					
	AS	0.119	0.091	25.432	0.077
	DE	0.501			
	HW	0.050			
	ARMA	0.099	0.078	22.675	0.065
5. Netherlands to Austria					
	AS	0.059	0.049	2.019	0.010
	DE	0.712			
	HW	0.048			
	ARMA	0.045	0.036	1.550	0.008
6. USA to Austria					
	AS	0.131	0.092	35.953	0.073
	DE	0.536			
	HW	0.057			
	ARMA	0.121	0.094	90.872	0.068
7. Turkey to Austria					
	AS	0.244	0.217	8.649	0.048
	DE	0.140			
	HW	0.068			

	ARMA	0.174	0.154	6.147	0.035

5.1.2 MALTA INBOUND:

8. Austria to Malta					
	AS	0.257	0.194	37.094	0.150
	DE	0.439			
	HW	0.067			
	ARMA	0.250	0.188	34.581	0.145
9. Denmark to Malta					
	AS	0.204	0.168	132.84	0.233
	DE	0.326			
	HW	0.043			
	ARMA	0.136	0.112	66.872	0.159
10. Germany to Malta					
	AS	0.105	0.085	14.801	0.077
	DE	0.199			
	HW	0.040			
	ARMA	0.098	0.078	14.385	0.071
11. Italy to Malta					
	AS	0.135	0.093	10.040	0.048
	DE	0.627			
	HW	0.017			
	ARMA	0.125	0.089	13.165	0.045
12. Libya to Malta					
	AS	0.215	0.177	25.608	0.118
	DE	0.281			
	HW	0.140			
	ARMA	0.253	0.213	28.546	0.140
13. UK to Malta					
	AS	0.127	0.098	83.878	0.081
	DE	0.385			
	HW	0.049			
	ARMA	0.141	0.116	111.938	0.090
14. USA to Malta					
	AS	0.126	0.095	2.007	0.013
	DE	0.271			
	HW	0.039			
	ARMA	0.119	0.089	1.876	0.012

5.1.3 N. CYPRUS INBOUND:

15. Turkey to N.Cyprus(83)

AS	0.178	0.136	10.141	0.065
DE	0.226			
HW	0.128			
ARMA	0.126	0.098	7.346	0.046
16. UK to N. Cyprus				
AS	0.195	0.158	5.797	0.034
DE	0.487			
HW	0.032			
ARMA	0.292	0.241	8.898	0.0750
17. Germany to N. Cyprus				
AS	0.252	0.184	5.853	0.038
DE	0.343			
HW	0.138			
ARMA	0.188	0.140	4.162	0.029
18. USA to N. Cyprus				
AS	0.296	0.248	3.384	0.020
DE	0.419			
HW	0.223			
ARMA	0.291	0.232	3.137	0.019
19. Australia to N. Cyprus				
AS	0.645	0.468	6.934	0.047
DE	0.692			
HW	0.042			
ARMA	0.554	0.420	6.259	0.040
20. Turkey to N. Cyprus				
AS	0.105	0.077	129.627	0.219
DE	0.207			
HW	0.055			
ARMA	0.085	0.067	169.360	0.171

5.1.4 TURKEY INBOUND:

21. Germany to Turkey				
AS	0.275	0.237	42.450	0.107
DE	0.720			
HW	0.062			
ARMA	0.222	0.187	28.711	0.087
22. Austria to Turkey				
AS	0.261	0.014	31.958	0.083
DE	0.881			
HW	0.172			
ARMA	0.296	0.258	26.902	0.093

23. France to Turkey

	AS	0.276	0.235	57.850	0.160
	DE	0.866			
	HW	0.247			
	ARMA	0.281	0.226	55.067	0.163

24. UK to Turkey

	AS	0.191	0.150	61.390	0.087
	DE	0.948			
	HW	0.111			
	ARMA	0.195	0.158	103.568	0.089

25. Italy to Turkey

	AS	0.203	0.183	116.156	0.078
	DE	0.844			
	HW	0.179			
	ARMA	0.166	0.146	68.948	0.065

26. USA to Turkey

	AS	0.112	0.081	4.790	0.028
	DE	0.665			
	HW	0.084			
	ARMA	0.096	0.078	4.576	0.024

27. N. Cyprus to Turkey(86)

	AS	0.082	0.070	2.840	0.016
	DE	0.275			
	HW	0.054			
	ARMA	0.072	0.052	2.053	0.014

28. Israel to Turkey

	AS	0.275	0.227	116.986	0.073
	DE	0.703			
	HW	0.402			
	ARMA	0.254	0.220	145.535	0.067

29. Denmark to Turkey

	AS	0.295	0.259	116.588	0.114
	DE	0.919			
	HW	0.166			
	ARMA	0.311	0.233	145.880	0.119

30. Switzerland to Turkey

	AS	0.243	0.205	38.254	0.133
	DE	0.861			
	HW	0.137			
	ARMA	0.179	0.155	27.288	0.095

31. Greece to Turkey

AS	0.175	0.129	11.851	0.069
DE	0.367			
HW	0.107			
ARMA	0.207	0.186	16.844	0.080

32. Belgium to Turkey

AS	0.266	0.208	49.770	0.142
DE	0.836			
HW	0.078			
ARMA	0.221	0.195	39.969	0.117

33. Netherlands to Turkey

AS	0.231	0.505	199.146	0.096
DE	0.938			
HW	0.079			
ARMA	0.202	0.173	55.839	0.084

5.1.5 UK INBOUND:

34. USA to UK

AS	0.098	0.071	9.406	0.048
DE	0.260			
HW	0.025			
ARMA	0.085	0.062	11.104	0.042

35. Germany to UK

AS	0.088	0.070	3.517	0.022
DE	0.259			
HW	0.016			
ARMA	0.071	0.058	2.971	0.017

36. Austria to UK

AS	0.151	0.124	7.527	0.021
DE	0.342			
HW	0.012			
ARMA	0.122	0.100	6.245	0.033

37. France to UK

AS	0.143	0.118	4.922	0.029
DE	0.162			
HW	0.115			
ARMA	0.112	0.092	3.841	0.023

38. Japan to UK

AS	0.179	0.139	205.601	0.328
DE	0.169			
HW	0.050			
ARMA	0.184	0.134	161.547	0.355

39. Finland to UK

	AS	0.254	0.179	15.070	0.077
	DE	0.372			
	HW	0.085			
	ARMA	0.230	0.170	14.099	0.070

40. Spain to UK

	AS	0.104	0.081	5.583	0.035
	DE	0.263			
	HW	0.027			
	ARMA	0.102	0.078	5.475	0.034

41. IOM to UK

	AS	0.103	0.080	1.290	0.008
	DE	0.197			
	HW	0.049			
	ARMA	0.082	0.064	1.030	0.006

5.1.6 IOM INBOUND:

42. UK to IOM

	AS	0.178	0.150	199.136	0.077
	DE	0.859			
	HW	0.030			
	ARMA	0.109	0.074	63.346	0.049

43. EIRE to IOM

	AS	0.325	0.254	3.805	0.021
	DE	1.442			
	HW	0.135			
	ARMA	0.294	0.224	3.378	0.019

5.2 OVERALL FORECASTS
(2 years ahead 1994.1-1995.4)

5.2.1 AUSTRIA INBOUND:

1. Denmark to Austria

		RMSE	MAE	MAPE	TIC
	AS	0.047	0.039	2.632	0.0120
	DE	0.860			
	HW	0.012			
	ARMA	0.048	0.037	2.230	0.0123

2. France to Austria

		RMSE	MAE	MAPE	TIC
	AS	0.092	0.080	10.704	0.044
	DE	0.785			
	HW	0.015			
	ARMA	0.048	0.044	7.913	0.024

3. UK to Austria

AS	0.064	0.053	14.134	0.034
DE	0.572			
HW	0.033			
ARMA	0.050	0.034	9.238	0.027

4. Canada to Austria

AS	0.122	0.111	33.126	0.068
DE	0.551			
HW	0.048			
ARMA	0.0523	0.044	9.049	0.029

5. Netherlands to Austria

AS	0.051	0.043	1.867	0.009
DE	0.977			
HW	0.0211			
ARMA	0.0360	0.030	1.317	0.006

6. USA to Austria

AS	0.088	0.073	25.277	0.049
DE	0.623			
HW	0.018			
ARMA	0.062	0.047	12.241	0.035

7. Turkey to Austria

AS	0.300	0.285	10.434	0.054
DE	0.295			
HW	0.046			
ARMA	0.199	0.170	6.070	0.036

5.2.2 MALTA INBOUND:

8. Austria to Malta

AS	0.211	0.189	55.873	0.164
DE	0.516			
HW	0.0629			
ARMA	0.312	0.239	59.517	0.225

9. Denmark to Malta

AS	0.247	0.205	146.98	0.306
DE	0.381			
HW	0.068			
ARMA	0.121	0.100	40.119	0.164

10. Germany to Malta

AS	0.101	0.081	15.951	0.087
DE	0.275			
HW	0.018			

	ARMA	0.089	0.0738	16.202	0.076
11. Italy to Malta					
	AS	0.177	0.121	13.964	0.075
	DE	0.623			
	HW	0.016			
	ARMA	0.163	0.128	24.403	0.069
12. Libya to Malta					
	AS	0.178	0.157	33.120	0.124
	DE	0.241			
	HW	0.076			
	ARMA	0.174	0.163	29.756	0.127
13. UK to Malta					
	AS	0.132	0.101	17.625	0.083
	DE	0.387			
	HW	0.044			
	ARMA	0.141	0.111	18.659	0.089
14. USA to Malta					
	AS	0.061	0.043	0.954	0.006
	DE	0.295			
	HW	0.030			
	ARMA	0.119	0.098	2.139	0.013

5.2.3 N. CYPRUS INBOUND:

15. Turkey to N.Cyprus(83)					
	AS	0.088	0.080	6.913	0.039
	DE	0.156			
	HW	0.058			
	ARMA	0.059	0.046	4.280	0.026
16. UK to N. Cyprus					
	AS	0.197	0.161	6.392	0.039
	DE	0.663			
	HW	0.128			
	ARMA	0.261	0.212	8.589	0.051
17. Germany to N. Cyprus					
	AS	0.284	0.194	7.036	0.051
	DE	0.552			
	HW	0.052			
	ARMA	0.095	0.079	2.951	0.017
18. USA to N. Cyprus					
	AS	0.299	0.254	3.728	0.021
	DE	0.384			

HW	0.008			
ARMA	0.186	0.161	2.327	0.013

19. Australia to N. Cyprus

AS	0.684	0.511	8.592	0.052
DE	0.356			
HW	0.088			
ARMA	0.603	0.456	7.545	0.047

20. Turkey to N. Cyprus

AS	0.074	0.060	245.877	0.186
DE	0.170			
HW	0.043			
ARMA	0.0735	0.056	358.257	0.177

<u>5.2.4 TURKEY INBOUND:</u>

21. Germany to Turkey

AS	0.291	0.232	33.384	0.107
DE	0.806			
HW	0.0841			
ARMA	0.231	0.162	18.870	0.082

22. Austria to Turkey

AS	0.240	0.204	24.176	0.0758
DE	0.846			
HW	0.064			
ARMA	0.318	0.302	37.425	0.098

23. France to Turkey

AS	0.200	0.168	51.485	0.193
DE	0.763			
HW	0.042			
ARMA	0.181	0.158	49.576	0.178

24. UK to Turkey

AS	0.254	0.219	29.911	0.107
DE	1.161			
HW	0.122			
ARMA	0.261	0.228	31.438	0.110

25. Italy to Turkey

AS	0.174	0.169	225.127	0.075
DE	0.879			
HW	0.028			
ARMA	0.129	0.113	129.512	0.055

26. USA to Turkey

AS	0.0573	0.048	3.252	0.0180

	DE	0.741			
	HW	0.011			
	ARMA	0.0576	0.039	2.394	0.018
27. N. Cyprus to Turkey(86)					
	AS	0.053	0.045	2.0002	0.011
	DE	0.291			
	HW	0.022			
	ARMA	0.027	0.022	1.0081	0.006
28. Israel to Turkey					
	AS	0.330	0.250	11.419	0.067
	DE	0.887			
	HW	0.100			
	ARMA	0.176	0.152	6.048	0.034
29. Denmark to Turkey					
	AS	0.227	0.206	239.940	0.078
	DE	1.099			
	HW	0.106			
	ARMA	0.270	0.172	315.024	0.094
30. Switzerland to Turkey					
	AS	0.276	0.244	41.060	0.172
	DE	0.857			
	HW	0.515			
	ARMA	0.211	0.194	32.673	0.128
31. Greece to Turkey					
	AS	0.150	0.107	9.058	0.062
	DE	0.356			
	HW	0.070			
	ARMA	0.208	0.186	16.722	0.083
32. Belgium to Turkey					
	AS	0.197	0.175	43.065	0.105
	DE	0.938			
	HW	0.031			
	ARMA	0.156	0.139	28.394	0.082
33. Netherlands to Turkey					
	AS	0.154	0.130	35.202	0.064
	DE	1.154			
	HW	0.0367			
	ARMA	0.115	0.102	16.957	0.047

5.2.5 UK INBOUND:

34. USA to UK

	AS	0.085	0.063	6.177	0.038
	DE	0.353			
	HW	0.014			
	ARMA	0.033	0.026	2.923	0.015
35. Germany to UK					
	AS	0.106	0.082	3.995	0.0263
	DE	0.324			
	HW	0.021			
	ARMA	0.079	0.0615	2.997	0.019
36. Austria to UK					
	AS	0.167	0.146	7.426	0.041
	DE	0.455			
	HW	0.030			
	ARMA	0.112	0.103	5.130	0.027
37. France to UK					
	AS	0.155	0.124	4.897	0.030
	DE	0.223			
	HW	0.094			
	ARMA	0.107	0.090	3.586	0.021
38. Japan to UK					
	AS	0.068	0.053	50.369	0.120
	DE	0.193			
	HW	0.033			
	ARMA	0.069	0.059	89.312	0.122
39. Finland to UK					
	AS	0.186	0.138	7.416	0.055
	DE	0.341			
	HW	0.012			
	ARMA	0.176	0.137	7.568	0.052
40. Spain to UK					
	AS	0.151	0.129	8.863	0.048
	DE	0.319			
	HW	0.005			
	ARMA	0.148	0.124	8.555	0.047
41. IOM to UK					
	AS	0.067	0.058	0.917	0.005
	DE	0.206			
	HW	0.006			
	ARMA	0.043	0.0357	0.565	0.003

5.2.6 IOM INBOUND:

42. UK to IOM

AS	0.147	0.125	18.464	0.063
DE	1.108			
HW	0.030			
ARMA	0.088	0.052	5.299	0.0403

43. EIRE to IOM

AS	0.231	0.191	2.678	0.015
DE	1.615			
HW	0.074			
ARMA	0.223	0.168	2.521	0.014

5.3 OVERALL FORECASTS

(1 year ahead 1995.1-1995.4)

	RMSE	MAE	MAPE	TIC

5.3.1 AUSTRIA INBOUND:

1. Denmark to Austria

AS	0.041	0.033	2.091	0.010
DE	0.960			
HW	1.24E			
ARMA	0.048	0.035	1.685	0.012

2. France to Austria

AS	0.088	0.070	7.653	0.044
DE	1.170			
HW	0.000			
ARMA	0.048	0.045	7.529	0.024

3. UK to Austria

AS	0.054	0.049	17.678	0.030
DE	0.357			
HW	0.000			
ARMA	0.015	0.013	5.616	0.009

4. Canada to Austria

AS	0.115	0.106	19.655	0.061
DE	0.756			
HW	1.39E			
ARMA	0.216	0.202	39.635	0.125

5. Netherlands to Austria

AS	0.034	0.0299	1.176	0.006
DE	1.365			
HW	0.000			

	ARMA	0.038	0.033	1.415	0.0069
6. USA to Austria					
	AS	0.117	0.106	31.006	0.063
	DE	0.807			
	HW	2.81E			
	ARMA	0.080	0.067	11.545	0.044
7. Turkey to Austria					
	AS	0.300	0.273	9.926	0.054
	DE	0.426			
	HW	0.000			
	ARMA	0.198	0.175	6.297	0.036

<u>5.3.2 MALTA INBOUND:</u>

8. Austria to Malta					
	AS	0.235	0.221	83.597	0.196
	DE	0.654			
	HW	1.39E			
	ARMA	0.376	0.314	88.876	0.284
9. Denmark to Malta					
	AS	0.245	0.219	129.680	0.325
	DE	0.253			
	HW	1.39E			
	ARMA	0.117	0.100	33.302	0.155
10. Germany to Malta					
	AS	0.118	0.095	17.101	0.101
	DE	0.261			
	HW	6.80E			
	ARMA	0.089	0.071	11.610	0.076
11. Italy to Malta					
	AS	0.111	0.076	15.357	0.048
	DE	0.935			
	HW	1.31E			
	ARMA	0.166	0.123	31.838	0.072
12. Libya to Malta					
	AS	0.161	0.127	40.010	0.129
	DE	0.279			
	HW	8.33E			
	ARMA	0.162	0.142	33.437	0.142
13. UK to Malta					
	AS	0.126	0.111	18.680	0.084
	DE	0.533			
	HW	0.000			

ARMA	0.136	0.116	18.032	0.089

14. USA to Malta

AS	0.082	0.065	1.437	0.009
DE	0.365			
HW	0.000			
ARMA	0.129	0.115	2.534	0.014

5.3.3 N. CYPRUS INBOUND:

15. Turkey to N.Cyprus(83)

AS	0.048	0.046	4.354	0.022
DE	0.229			
HW	0.000			
ARMA	0.053	0.045	43687	0.024

16. UK to N. Cyprus

AS	0.181	0.162	6.742	0.037
DE	0.525			
HW	2.48E			
ARMA	0.108	0.094	3.773	0.022

17. Germany to N. Cyprus

AS	0.101	0.100	3.782	0.018
DE	0.438			
HW	0.000			
ARMA	0.109	0.094	3.482	0.020

18. USA to N. Cyprus

AS	0.324	0.257	3.618	0.023
DE	0.389			
HW	0.000			
ARMA	0.208	0.177	2.476	0.014

19. Australia to N. Cyprus

AS	0.938	0.796	13.678	0.073
DE	0.334			
HW	4.44E			
ARMA	0.832	0.759	12.758	0.065

20. Turkey to N. Cyprus

AS	0.053	0.045	43.174	0.113
DE	0.241			
HW	7.76E			
ARMA	0.037	0.029	21.576	0.078

5.3.4 TURKEY INBOUND:

21. Germany to Turkey

	AS	0.270	0.246	23.484	0.092
	DE	0.731			
	HW	2.78E			
	ARMA	0.138	0.104	12.147	0.044
22. Austria to Turkey					
	AS	0.171	0.127	15.203	0.053
	DE	0.813			
	HW	1.11E			
	ARMA	0.259	0.255	42.814	0.080
23. France to Turkey					
	AS	0.140	0.120	43.704	0.135
	DE	0.765			
	HW	0.000			
	ARMA	0.194	0.170	58.994	0.178
24. UK to Turkey					
	AS	0.292	0.260	24.255	0.118
	DE	1.069			
	HW	1.24E			
	ARMA	0.298	0.271	24.958	0.121
25. Italy to Turkey					
	AS	0.189	0.185	233.239	0.082
	DE	1.230			
	HW	1.39E			
	ARMA	0.146	0.124	197.58	0.063
26. USA to Turkey					
	AS	0.054	0.052	3.981	0.0173
	DE	0.653			
	HW	2.22E			
	ARMA	0.065	0.042	2.284	0.021
27. N. Cyprus to Turkey(86)					
	AS	0.051	0.047	2.230	0.012
	DE	0.327			
	HW	0.000			
	ARMA	0.016	0.014	0.710	0.003
28. Israel to Turkey					
	AS	0.281	0.254	10.814	0.056
	DE	0.683			
	HW	2.48E			
	ARMA	0.139	0.121	5.035	0.027
29. Denmark to Turkey					
	AS	0.219	0.187	41.452	0.072

DE	1.038			
HW	1.46E			
ARMA	0.300	0.176	58.801	0.097

30. Switzerland to Turkey

AS	0.222	0.181	20.768	0.130
DE	0.711			
HW	0.000			
ARMA	0.201	0.176	25.743	0.110

31. Greece to Turkey

AS	0.186	0.147	12.832	0.074
DE	0.297			
HW	1.67E			
ARMA	0.070	0.067	5.625	0.027

32. Belgium to Turkey

AS	0.144	0.120	44.302	0.071
DE	1.056			
HW	2.78E			
ARMA	0.122	0.115	30.389	0.057

33. Netherlands to Turkey

AS	0.194	0.168	59.392	0.082
DE	0.969			
HW	5.55E			
ARMA	0.102	0.096	23.047	0.041

<u>5.3.5 UK INBOUND</u>:

34. USA to UK

AS	0.105	0.082	8.266	0.046
DE	0.437			
HW	7.85E			
ARMA	0.029	0.028	2.631	0.013

35. Germany to UK

AS	0.083	0.078	3.735	0.020
DE	0.364			
HW	0.000			
ARMA	0.068	0.066	3.219	0.016

36. Austria to UK

AS	0.133	0.115	5.475	0.032
DE	0.626			
HW	0.000			
ARMA	0.108	0.099	4.677	0.026

37. France to UK

	AS	0.164	0.125	4.815	0.031
	DE	0.242			
	HW	0.000			
	ARMA	0.111	0.093	3.627	0.021
38. Japan to UK					
	AS	0.073	0.057	75.893	0.118
	DE	0.364			
	HW	0.000			
	ARMA	0.0755	0.060	144.348	0.119
39. Finland to UK					
	AS	0.191	0.144	7.474	0.053
	DE	0.367			
	HW	0.000			
	ARMA	0.193	0.134	6.849	0.054
40. Spain to UK					
	AS	0.113	0.196	6.697	0.035
	DE	0.298			
	HW	0.000			
	ARMA	0.103	0.088	6.313	0.032
41. IOM to UK					
	AS	0.066	0.064	1.032	0.005
	DE	0.266			
	HW	0.000			
	ARMA	0.029	0.021	0.343	0.002

5.3.6 THE IOM INBOUND:

42. UK to IOM					
	AS	0.161	0.137	19.225	0.071
	DE	1.433			
	HW	6.21E			
	ARMA	0.028	0.023	3.572	0.013
43. EIRE to IOM					
	AS	0.130	0.118	1.618	0.008
	DE	2.303			
	HW	4.44E			
	ARMA	0.225	0.153	2.375	0.015