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Initial Public Offerings in Australia: An Empirical Examination of Initial Price and Aftermarket Operating Performance of Family and Non-Family Controlled Companies

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Statement of Authorship

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Signed....[redacted]......

Nicholas A Mroczkowski

Date..........8th January 2003..........

Abstract

Recent capital market research evidence suggests that a large proportion of public companies worldwide are characterized by controlling stockholders who are more often families, usually the founder(s) or their descendants. The family business literature also indicates an increasing recognition of the significance of family businesses in modern economies, particularly in the context of substantial contributions to GDP. Indeed there appears to be an increasing popularity of the family enterprise in growing economies. Against this background, the current study empirically examines the initial price performance and long-term operating performance of family IPO firms.

Results show that more than 21% percent of qualifying IPO firms that listed on the Australian bourse during 1988 and 1999 are family controlled. Regression analyses results between firm value and initial underpricing (as endogenous variables), with exogenous factors, provide strong support for signalling theory and agency theory albeit for different reasons. After allowing for industry effects, results of independent *t*-tests indicate that family firms are considerably less underpriced than their non-family counterparts, which is not consistent with signalling theories. That is, family firms are not leaving 'money on the table' as a signal of quality to outside investors. It also appears that family firms are minimising the loss of wealth attributable to existing shareholders on initial issue, by pricing issues closer to the true value of the firm. However, the significant differences between family and non-family firms in initial underpricing using independent *t*-tests must be interpreted in light of the results of a WLS regression which includes all variables. These results show that when regressed on variables known to influence underpricing (e.g., firm age, firm value retained ownership, firm size, firm type [FB and NFB], firm risk, underwriter and auditor prestige and industry factors), firm type is shown not to be a significant predictor of initial underpricing. The results also show that, when fractional interest is regressed with firm value, and when market adjusted returns are regressed with firm value, there is significant positive association in both cases for family and non-family firms. Other significant findings include strong associations between underpricing and firm size and underpricing and firm risk, which provide support for the risk/return phenomenon.

Perhaps one of the more significant findings, is the substantial explanatory power exhibited when market adjusted underpricing is regressed with several independent variables known to influence underpricing (including firm value, firm age, issue size, ex ante uncertainty, underwriter prestige, auditor prestige, FB_NFB, and mining). Indeed the inter-correlation of these variables on market adjusted underpricing explained more than 38% of the variance. Moreover, most of these variables were also found to be reliable predictors of market adjusted underpricing.

The findings also show that the post-operating performance of Australian IPO firms deteriorates considerably over a three year-period relative to the period immediately prior to listing, (which is consistent with several other studies) and also that family firms performed far worse than non-family firms. Interestingly however, family firms with higher levels of fractional interest outperform firms with lower levels of fractional interest, which suggests some support for agency theory. The results further show that firm leverage and capital expenditure are reliable predictors of operating performance. In addition, substantial explanatory power is exhibited by the four operating performance models in this study. Indeed, three of the four models account for more than 60% of the variance in operating performance.

The study provides plausible explanations for the major research findings together with important implications for issuers, market participants and regulators. Briefly, some of these implications include, 1) benefits that should arguably arise from the availability of an authoritative definition of family business (for instance the enhanced ability to delineate family firms from non-family firms may provide a more reliable basis for collecting and analysing data specifically relating to family firms and thus accurately reflecting the economic significance of family firms), 2) the knowledge of significant differences in initial underpricing between family and non-family firms will allow market participants to make more informed investment choices according to their investment preferences (for example, investors seeking higher immediate returns may choose to invest in non-family firms which exhibit higher initial underpricing), 3) the knowledge of factors that drive initial returns may also be of interest to market participants, particularly issuers and their advisers seeking to ensure the success of an impending float, 4) the knowledge of deteriorating performance levels for all IPO firms post listing could act as a significant disincentive for investors seeking to make choices between competing investments, 5) further evidence for regulatory intervention given that, on average, most companies underperform for a period of up to three years post-listing.

Finally, areas of further research, particularly in the family business and finance discipline, are also explored in this study. These include a longer window for examining share returns for both family and non-family firms, the examination of subsequent share issues for further testing signalling theories, an examination of the effects of different capital structures (and composition of equity structures) on underpricing, and the possible effects on underpricing from further (deregulatory) changes in prospectus legislation introduced as part of the Australian Commonwealth government's Corporate Law Economic Reform (CLERP).

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Chapter 1: Overview and Purpose of Study

1.1 Introduction

This study provides an empirical analysis of the initial price and aftermarket operating performance of Australian Initial Public Offerings (IPOs). More specifically, the study examines IPO price and aftermarket-operating performance of family and non-family controlled companies between the periods 1 January 1988 and 31 December 1999. The factors that potentially influence initial price and operating performance for these two groups of companies are also considered in this study. These factors include the size of firm, size of share issue, firm age, timing of share issue (market cycles), reputation of auditor, reputation of underwriter, changes to corporate legislation, level of ownership retention post-issue by founding shareholders, ex ante uncertainty (risk) associated with the issue, existence of a profit forecast in the prospectus, and level of external debt and capital expenditure. Given the paucity of studies on the long-term operating performance of IPOs and increasing recognition of the significance of family firms in modern economies, this study is somewhat unique.

Both IPOs and family businesses are thus the focus of this study, and to provide a better understanding of the nature of the study, definitions of both terms are briefly considered below. An IPO (also referred to as an unseasoned issue of ordinary shares) is generally defined as the first issue of shares by a company seeking to obtain a listing on a stock exchange (Mustow, 1994, p. 7; How, 1990, p. 319). A family business however, is much more difficult to define given the diversity of definitions in the literature. Generally, there is consensus that a family business is one in which family members have substantial ownership interest and exercise control of the operating and financing decisions of the enterprise (Sharma, Chrisman, & Chua, 1996). What is also evident in the literature is that family businesses enjoy an alignment between ownership and control, and the dynamics of this alignment reduces agency costs which impacts favourably on firm performance (Schillaci & Faraci, 1999; Fama, 1998; McConaughy, 1994; Jensen & Meckling, 1976). This study not only considers the definitional complexities of 'family business', but also the importance of using an agency theoretic perspective in explaining price and operating performance of family and non-family business IPOs.

There is an extensive and diverse body of evidence on the initial and post-issue performance of IPOs, from which two empirical regularities have generally emerged;

1. IPOs are significantly underpriced in the initial period following listing, (Bruton & Prasad, 1997; Steen, 1997 provide a comprehensive synthesis of the literature on initial underpricing). Although various definitions (largely dependent on the length of the initial period) are proposed in the literature, initial underpricing is generally defined as the difference between the issue price quoted on the prospectus and the closing price on opening day of trading (How, 1990).

2. Share returns of IPOs significantly underperform in both the short and long-term aftermarket periods (Ritter, 1991; Levis, 1993, 1994; Loughran & Ritter, 1995; Lee, Taylor, & Walter, 1996). Moreover, the operating performance of IPO firms in the aftermarket period underperform relative to non-IPO firms (Jain & Kini, 1994; Balatbat, 2001). Aftermarket performance has been defined widely in the literature and includes measures of excess share returns ranging from an initial period post-listing up to 1, 5, 20, 30, 60, 90, 120 days or even up to 3 years after listing.

In the context of this study, aftermarket price performance refers to changes in the market value of a share as measured by cumulative abnormal residuals (hereafter CARS) over the first year of trading. More recently however, researchers have used other measures for determining aftermarket performance, for example, Jain and Kini (1994) use accounting variables as proxies for cashflows to measure operating performance of IPO firms. Whilst some coverage on aftermarket price performance issues is provided (see Chapter 4), this study is primarily concerned with aftermarket operating performance of IPO firms.

Despite extensive evidence relating to initial and aftermarket price performance of IPOs both in Australia and internationally (Merrett, Howe, & Newbould, 1967; Reilly & Hatfield, 1969; Ibbotson, 1975; Ritter, 1984b, Finn & Higham, 1988; Beatty, 1989; How, 1993, 1994; Lee, Taylor, & Walter, 1991; Steen, 1997), the issue of IPOs in the context of family business has largely been ignored in the literature. Notwithstanding, some relevance to family business can arguably be drawn from certain aspects of the IPO literature. For example, numerous studies have examined the influence of fractional ownership interests retained by founding shareholders on the value of the IPO firm and on price performance in the initial returns period (Ritter, 1984(b); McBain & Krause, 1989; Clarkson, Dontoh, Richardson, & Sefcik, 1991; Koh, Lim, & Chin, 1992; Downes & Heinkel, 1982; How & Low, 1993; Jain & Kini, 1994).

There are several perspectives to the theory underlying the link between the level of share ownership retained by the founding shareholders of the firm, and the post-issue value of the firm. Typically however, two theories receive prominence in the literature; agency theory and signalling theory. The agency theoretic perceptive assumes that true firm value is endogenous since owners-entrepreneurs are able to determine the level of shareholdings they wish to retain in the firm post IPO. Moreover, it is further assumed that there is no information asymmetry between issuers and investors, except to the extent that investors are unable to observe the behaviour of managers (Ritter, 1984(b)). Managers in firms with diffuse ownership structures (as a consequence of lower equity retention held by owners-entrepreneurs) are more likely to engage in managerial shirking (Jensen & Meckling, 1986) which will reduce cash flows and concomitantly firm value. Thus the lower the level of equity retained by owners-entrepreneurs, the lower the value of the firm. Conversely, signalling theory assumes that true firm value is exogenous and not causally dependant on the level of insider holdings. There is an assumed information asymmetry between issuers and investors which can be addressed by firms conveying signals of private knowledge to the market. Among the first reported links between firm value and the level of insider holdings as a signal of firm quality was by Leland and Pyle (1977), who found that an entrepreneur's willingness to invest in his own project "can serve as a signal of project quality" (p.372). They also argued, consistent with the finding of Jensen and Meckling (1976) that "the value of the firm increases with share of the firm held by the entrepreneur" (p.372). Similar findings were subsequently reported by numerous contributors to the literature, including Downes and Heinkel (1982), Allen and Faulhaber (1989), and McBain and Krause (1989), Clarkson, Dontoh, Richardson and Sefcik (1991), and How and Low (1993). Given that the family business literature identifies ownership as a distinguishing feature of family businesses, this study has reviewed and considered the importance of the agency and signalling theories in the context of family business.

Moreover, a number of factors have been cited in the literature as possible explanations for initial underpricing and aftermarket underperformance, some of which include (but are not limited to): share issue and firm-specific factors, for instance, age and size of firm, size of assets, size of proceeds and intended use of funds raised; reputation of the auditor and the underwriter; timing of share issue and economic cycles; regulatory and institutional environments; agency costs; window-dressing accounts prior to listing; and information asymmetries in the IPO market. This study will consider some of these factors and the extent of their influence (if any) on IPO price and operating performance of family and non-family controlled companies.

The overall study is divided into three manageable sections encompassing the following:

Section 1. Definition of Family Business
Section 2. Initial Price Performance of Family and Non-Family Business IPOs
Section 3: Aftermarket Operating Performance of Family and Non-Family Business IPOs

The main sections of the study are summarised in Figure 1.

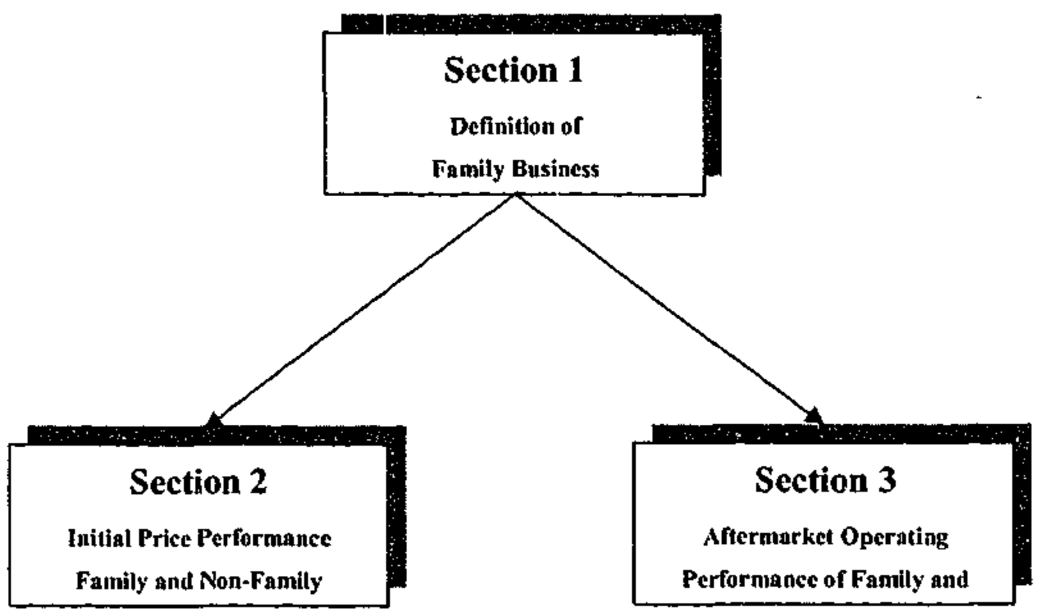


Figure 1.1: The Three Stages of the Study

1.2 Purpose and Objectives of the Study

Consistent with the themes developed above, the overall purpose of this study is to examine the various definitions of family business, develop measurement models for initial returns and aftermarket operating performance, and analyse and explain initial and aftermarket performance of Australian family and non-family business IPOs. In addition, this study will explain the extent to which pricing and operating performance is influenced by firm and non-firm variables for family and non-family controlled companies.

To satisfy the requirements of this study, the specific objectives are:

1. To examine, explain and propose a new definition of family business;
2. To explain the nature of IPOs, including the parties involved, and the processes and regulatory aspects of IPOs in Australia;
3. To examine and explain the IPO initial underpricing phenomenon;
4. To develop a measurement model for determining initial underpricing of Australian IPOs;
5. To examine and explain firm-specific, issue-specific and environmental factors known to influence initial underpricing of IPO firms;
6. To empirically examine the extent to which firm-specific, issue-specific and environmental factors, also influence the level of underpricing of Australian IPOs;
7. To empirically examine differences between the level of IPO underpricing of Australian family and non-family businesses, and the extent to which these differences are explained by firm-specific, issue-specific, and environmental factors;
8. To examine the long-term aftermarket IPO underperformance phenomenon;
9. To develop a measurement model for determining the operating performance of Australian IPOs in the long-term; and
10. To empirically examine differences between the level of IPO operating performance of Australian family and non-family businesses.

1.3 Background to the study

A review of the literature in the areas encompassing family business, IPOs and agency theory generally has identified a number of opportunities for new research, particularly in respect to the definition of family business and the initial and long-term aftermarket performance of IPOs in the context of family business. Moreover, an increasing interest in the family business literature has focused on the role of the family business in international economies, and in many instances, evidence suggests that these firms are emerging as substantial contributors to the Gross Domestic Product (Ward & Aronoff, 1990; Stoy Hayward and the London Business School, 1990; Connolly & Jay, 1996; Francis, 1993; Sharma, Chrisman, & Chua, 1996; Upton, 1991; Fodor, Lash, & Mazza, 1995; Smyrnios, Romano, & Tanewski, 1997; Dyer, 1986; Shanker & Astrachan, 1996). More recently however, this evidence has been questioned, primarily because lack of an appropriate definition fails to properly delineate family business from non-family businesses. Thus, actual contributions made by family businesses are not clearly separated from other businesses. It is further argued that many of the sources of statistics quoted in the family business literature are not empirically sourced (Shanker & Astrachan, 1996). These revelations present an opportunity for new research concerning definitional issues and family business.

Relevant background to the study is provided below under the various sections in which the study was undertaken.

1.3.1 Section 1: Definition of Family Business

The first major aspect of this study is concerned with the definition of a family business. Recent studies have indicated a significant increase in the number of articles relating to family businesses in major journals over the past 10-15 years (Sharma, Chrisman, & Chua, 1996). Arguably, this growing interest in family business issues is not surprising given that family-controlled enterprises are now an integral and expanding segment of many modern economies (Smyrnios, Tanewski, & Romano, 1998). A surprising outcome of a review of the literature reveals a large number of different definitions of "family business". Sharma, Chrisman, and Chua (1996) report no less than 34 different definitions, of which 20 make reference to an element of ownership interest as a factor which determines the existence of a family business. Moreover, nine definitions make some reference to influence and/or control as determining factors but do not adequately articulate the meaning of their criteria in an operational context.

This study examines various definitions of family business in the literature and identifies difficulties in using 'ownership' as a criterion for establishing the existence of a family business. Moreover, analogous problems encountered by accountants in using the 'ownership' criterion to establish the relationship between a parent company and the companies in which it has an ownership interest, have also been considered. For example, using proportional ownership as a basis for determining whether a company should be consolidated as part of a group for financial reporting purposes.

The study also explores the manner in which the accounting profession now uses the 'control' criterion in establishing the existence of a parent/subsidiary relationship, and indeed, the usefulness of adopting this criterion for defining a family business.

1.3.2 Section 2: Initial Price Performance of Family Business IPOs

The second major aspect of this study examines the immediate price performance of Australian family business IPOs between the period commencing 1 January, 1988, and ending 31 December, 1999. This 12-year period was characterised by a number of major influences and changes to financial and capital markets and in this regard, represents a significant era in the history of Australian business. Counted amongst these changes was the stabilization of capital markets following dramatic collapses of stock markets around the world, including the Australian stock market in October 1987.

Shortly after the stock market collapse, Australia also experienced the spectacular demise of a number of high profile companies; Quintex, Estate Mortgage, Rothwells, Bond Corporation, and Pyramid, to mention just a few. Understandably, during this period the media was fraught with calls for greater financial disclosure, more director accountability, guidelines for corporate governance, more meaningful audit reports and tighter regulations, all of which were intended to protect the unsuspecting and presumably less informed investor. Substantial increases in regulation and other impositions soon followed not only for companies but a whole range of other investment vehicles in which public monies were exposed, for instance trust and entities involved with prescribed interest schemes.

The introduction of the Corporation Law (now termed the 'Corporations Act') was perhaps one of the most significant changes to unfold during the turmoil that followed the share market crash. It first became operative in 1991 and was heralded as a major government initiative to consolidate and streamline the outdated provisions of the various state Company Acts (Codes).

A major component of the legislation was intended to deregulate several functional aspects of existing legislation, including the share buy-back and capital raising provisions of the law. While it would seem that many of the changes introduced by the Corporations Law simplified large sections of outdated legislation, the general consensus amongst professional advisers was that the new provisions had the opposite effect for managers and account preparers. That is, there was a perception that the regulatory burden for companies, and more particularly in respect to the responsibilities for directors and their advisors, had increased enormously. This was later acknowledged by the government, particularly via the introduction of the First Corporate Law Simplification Act in December 1995. This Act was a major deregulatory initiative, which removed major sections of the Corporations Law; including, reporting requirements for small proprietary companies, and over 100 sections of law relating to share buy-backs.

The capital raising provisions of the Corporations Law were of major concern to IPO firms and their advisers, since the generality of the provisions of the law often required the preparation of extremely detailed and complex offer documents. The evidence in the literature suggests that these requirements have attributed to lower initial underpricing of IPOs by issuing firms, as greater quality information was included in prospectus documents as a precautionary measure in fear of invoking the severe penalties imposed by the Corporations Law (Steen, 1997). Indeed, directors and any persons mentioned on the prospectus were potentially liable under the provisions of the Law for any omissions of material information or the inclusion of misleading or false information in the prospectus document.

A number of other important regulatory changes impacted on the corporate environment during the study period, including substantive changes to the Australian Stock Exchange (ASX) Listing Rules, changes to applicable (legally backed) accounting standards and the deregulation of Australian financial markets. This study examines whether changes to the Australian reporting environment resulting from changes to the Corporations Law, influenced the level of initial pricing of family and non-family business IPOs.

This study also briefly examines the share issue process in Australia including the relevant legislative requirements relating to capital-raising. It is noted that a number of significant structural differences exist between the regulatory environment for capital-raising in Australia and other countries, notably the United States.

1.3.3 Section 3: Aftermarket Operating Performance of Family and Non-Family Business IPOs

As discussed above, Sections 1 and 2 establish a definition of family business for capital market research purposes, and examine the *underpricing phenomenon* for family and non-family firms. However, given that the literature has also identified significant issues relating to the post-listing performance of IPOs, some coverage of these issues is warranted in a study which examines the performance of listed family and non-family firms. Accordingly, Section 3 is an important component of the study which encompasses a brief examination and discussion of the long-term operating performance of family business IPOs in Australia between the periods 1 January, 1988 to 31 December, 1999. While the share price underperformance of IPOs in the long-term is well documented, less is known about the long-term operating performance of IPOs. This appears to be the first Australian study to examine the post-issue operating performance of family business IPOs. The limited evidence that is available on the operating performance of IPOs, principally Jain & Kini (1994) and Balatbat (2001) for Australian firms demonstrates a significant decline in post-issue performance of IPOs relative to pre-listing levels of performance. The literature also cites a number of possible reasons for the poor performance, including increased agency costs when firms move from private ownership to public ownership, manipulation of the accounting numbers prior to listing and timing of IPOs to coincide with favourable market conditions. This study examines the post-issue performance phenomenon in the context of Australian capital markets. The study also examines and contrasts the long-term operating performance of family business IPOs with non-family business IPOs.

1.4 Theoretical and Practical Significance

The outcomes of the study may have significant implications on a theoretical and practical level. The potential outcomes of each section of the study and their significance are briefly considered.

1.4.1 Definition of Family Business

Evidence in the literature suggests that the term 'family business' has been problematic given a plethora of definitions of family business in the literature, and most definitions have been constructed to suit the specific needs of the particular researcher (Wortman, 1995). Indeed, some studies demonstrate an important need to reach consensus on the definition of family business (Shanker & Astrachan, 1996).

This study establishes an operational definition of family business, which not only supports the broader objectives of the existing study, but might also provide a firm foundation for further research in an area, which is evidently fraught with definitional obstacles. In this regard, the definition of family business in this study will provide the basis for a generally accepted definition, at least for the purposes of capital market research.

To appreciate the magnitude of the definitional problems confronting family business researchers, it is useful to examine the potential outcomes of applying a range of different definitions. For instance, Shanker and Astrachan (1995) provide three dimensions of family business, viz; a broad definition based on family control in terms of strategic direction of the business, a mid-range definition in terms of direct family involvement in the business, and a narrow definition in terms of involvement of multiple generations involved in the business. "Based on these definitions, the number of family firms in the US can range from 4.1 million to 20.3 million firms, employ 19.8 million to 77.2 million individuals, and provide 12% to 49% of the GDP of the US" (Sharma, Chrisman, & Chua 1996, p. 8). These statistics serve to illustrate that a generally accepted definition of family business is an essential and much needed element of empirical research in the area of family business.

1.4.2 Initial Price Performance of IPOs

The results of the present study might well be significant given that there is substantial evidence that initial underpricing results in a significant loss of wealth not only to the specific issuer of scrip, but also in the case of government privatisation, to the wider economy as a whole. If for example, evidence in this study demonstrates that this loss of wealth is less for family controlled IPO firms in contrast to those which are non-family controlled, then there might be important implications for the IPO market, both from an issuer's and subscriber's perspective.

At the risk of being colloquial, where there is consistent evidence of lower underpricing, issuers will "get more for their buck" regardless of whether they are exiting the firm or financing new projects, because the market will be prepared to bear a higher issue price. From a subscribers perspective however, a higher issue price means lower underpricing and thus lower returns in the immediate aftermarket. This might have the effect of discouraging investors from subscribing to new issues made by family controlled firms, particularly speculators with little or no interest in the issuing firm. However, as reported in Allen and Faulhaber (1989), there may be another divergent perspective to consider when firms have a higher level of underpricing. It could be for instance, that these firms are able to withstand higher levels of underpricing and are thus signalling quality attributes to the market. In turn this strategy will earn investor confidence and thus build a credible base from which subsequent issues will be made at much higher issue prices.

Given the above, an important outcome of this study therefore, is arguably a comparison of the initial pricing performance of family business IPO firms compared with non-family business firms. This study also identifies the factors attributable to immediate pricing in both categories of IPOs. These findings might be significant in terms of the general investment community seeking to maximise returns in a competitive market by making informed choices between family business IPO stocks and non-family business IPO stocks. The evidence might also have implications for regulators who may perceive consistent underpricing as an irregularity attributable to market failures and thus as a signal for further government intervention.

1.4.3 Aftermarket Operating Performance of IPOs

Any study of IPOs that demonstrates the existence of consistent abnormal returns in the long-term aftermarket period, would be anomalous with an efficient market which rapidly adjusts to new information. However, given that this study is concerned more with operating performance based on accounting variables (in contrast to share price performance), the issue of market efficiency has only been given limited coverage (see Chapter 5). Thus this study provides evidence on the long-term operating performance of IPOs, which is of interest for several reasons.

First, firms making the transition from private to public ownership are attracted by a number of potential advantages offered by the public medium. Rock (1986) for example, proposes two advantages: An alternative source of inexpensive funds for firms without an established corporate history, and the ability of existing owners to diversify their respective portfolios by selling part of their ownership interest in the firm to the public. If the evidence in the present study is consistent with international and Australian evidence that IPOs generally under-perform in the long run, then it may be appropriate to call in to question the benefits of using the public ownership medium for raising funds or exiting the firm, particularly given the adverse impact on the long-term operating performance of the firm.

Moreover, if evidence in the study provides a link between the extent of decrement in the operating performance of the firm and level of ownership maintained by existing owners of the firm (particularly in the context of family versus non-family business), this finding should lend support to the agency problem described by Jensen and Meckling (1976). As will be discussed in this study, agency theory proposes that agency costs increase as the level of management ownership decreases in the public vehicle. Moreover, conflicts of interest between existing owners, shareholders and debt holders, are more likely to increase as management ownership decreases. Further, the operating performance of the firm could be affected as managers have incentives to increase their perquisite consumption.

Second, from the investors' point of view, expectations of future earnings of the firm are arguably based on pre-IPO accounting numbers prepared by managers and other related information (including earnings projections) as detailed in the prospectus. Thus, if operating performance of the firm has diminished to lower levels than pre- IPO levels, questions need to be asked about the IPO accounting numbers and other information used by managers in attracting investor subscriptions. Regulators, particularly the Australian Securities and Investments Commission (ASIC), should also have potential cause for concern given that a primary aim of the Corporations Law is to ensure that securities markets are well informed. If there is indeed a link between information disclosed in offer documents and investor decisions, as indicated by ASIC's own recent research (ASC, 1994, p. 11), then some answers need to be provided regarding the quality of these disclosures, particularly if performance projections based on pre-IPO numbers are anomalous with actual performance outcomes in the long term. This problem is referred to in the literature as "window dressing" (Jain & Kini, 1994)

Third, the study also might provide evidence that entrepreneurs strategically align share issues with periods of unusually high levels of performance, which cannot be sustained in the future. The existence of this phenomenon would be of interest to investors and regulators for similar reasons to those stated above.

1.5 Limitations of the Study

As discussed in the objectives section, this study is primarily concerned with two separate disciplines, viz family business and IPOs, both of which receive extensive coverage in the literature. Indeed, a myriad of issues have been well articulated in the family business and IPO literatures, both internationally and in Australia. Given the scope of this study and the allocated time for completion, many areas in these disciplines were unable to be given extensive coverage, if any at all. For instance, the review of the family business literature was by necessity confined to definitional issues and to those studies which focused on the performance aspects of family business. Moreover, the long-term price performance aspects of IPOs (particularly the market efficiency implications) have not been fully explored in the context of family business. Further, a number of factors known to have some influence on the price behaviour of IPOs, such as industry classification (other than mining) and taxes have not been covered in this study.

Finally, any outcomes associated with this study should be considered in the context of the following limitations;

1. The definition of a family business was derived on the basis of available data extracted from the ASX and ASIC databases. In this regard, names of directors, ownership of shares, and relationships between directors and related parties, were among the important criteria in determining the existence of a family business. It is noted that where relevant data were unavailable, a substantial ownership of shares by persons with similar family names were assumed to be related. Moreover, the definition of a family has been established in the context of capital markets research and wider application to all family businesses cannot be assumed.

2. A questionnaire was used to collect data from practising accountants (via a meeting and interview process) for the purposes of validating aspects of the definition of family business. It is assumed that all responses have been provided with honesty, integrity and without bias.

3. On the basis of the definition of family business in this study, it is assumed that family business IPOs can be delineated from non-family business IPOs.

4. All IPO shares are assumed to be ordinary shares for which the liability of shareholders is limited.

5. The evidence on the use of accounting variables to measure the operating performance of IPO firms post-listing is limited to three major studies (see Chapter 5). This study has adopted a similar approach used by Jain and Kini (1994) and Balatbat (2001), although it is recognised that there may be methodological issues raised regarding the use of median values for comparison purposes. The design in

section 3 of this study is based on the use of both mean and median values to assess operating performance measures.

6. Ratios have been calculated on the basis of available data. Where the numerator or denominator is non-existent, the observation has been deleted.

1.6 Summary

This Chapter presented an overview of the dissertation and its objectives. The remainder of the dissertation contains the following chapters:

- Chapter 2 – Going Public
- Chapter 3 – Review of the Literature
- Chapter 4 – Hypotheses of the Study
- Chapter 5 – Research Design, Methodology and Procedures
- Chapter 6 – Profile of Companies
- Chapter 7 – Initial Price Performance & Firm Value
- Chapter 8 – Results - After-Market Operating Performance
- Chapter 9 – Discussion, Conclusions, Implications and Recommendations

Chapter 2: Going Public

2.1 Introduction

The purpose of this chapter is to briefly consider the rationale for firms 'going public' together with an explanation of the processes in which a private firm makes the transition to a publicly listed firm. This includes a discussion on the significant role of IPOs in Australian capital markets, the regulatory aspects of an IPO, the role of the various parties involved in launching an IPO, and the mechanisms underlying the costing and pricing of IPOs. In essence, this chapter provides the necessary background for understanding some of the findings and issues raised in the literature, particularly in the context of the Australian IPO environment.

2.2 The Role of IPOs in Australian Capital Markets

The Australian equity market is becoming an increasingly important finance medium within the Australian financial system. Statistics released by the Australian Stock Exchange Limited (ASX Annual Report 1999, p13), show that the domestic equity market increased during the 1998-1999 period by 16% over 1997 and 1998, amounting to a total equity capitalisation of $568 billion. Moreover, this increase included $27.4 billion in new capital raisings, which comprised $5.6 billion raised via IPOs and $21.8 billion raised through seasoned issues, placements and other raisings by existing listed companies. It is further noted that the substantial increase during the 1997-98 period was primarily attributable to two major floats, AMP Ltd and Telstra. On a world basis, Australia is now ranked as the 11th largest equity market in terms of market capitalisation, having recently shifted from 13th position in 1998 (ASX Annual Report, 1999). Figure 2.1 illustrates the steady growth of new floats over a six-year period in the context of new equity raisings.

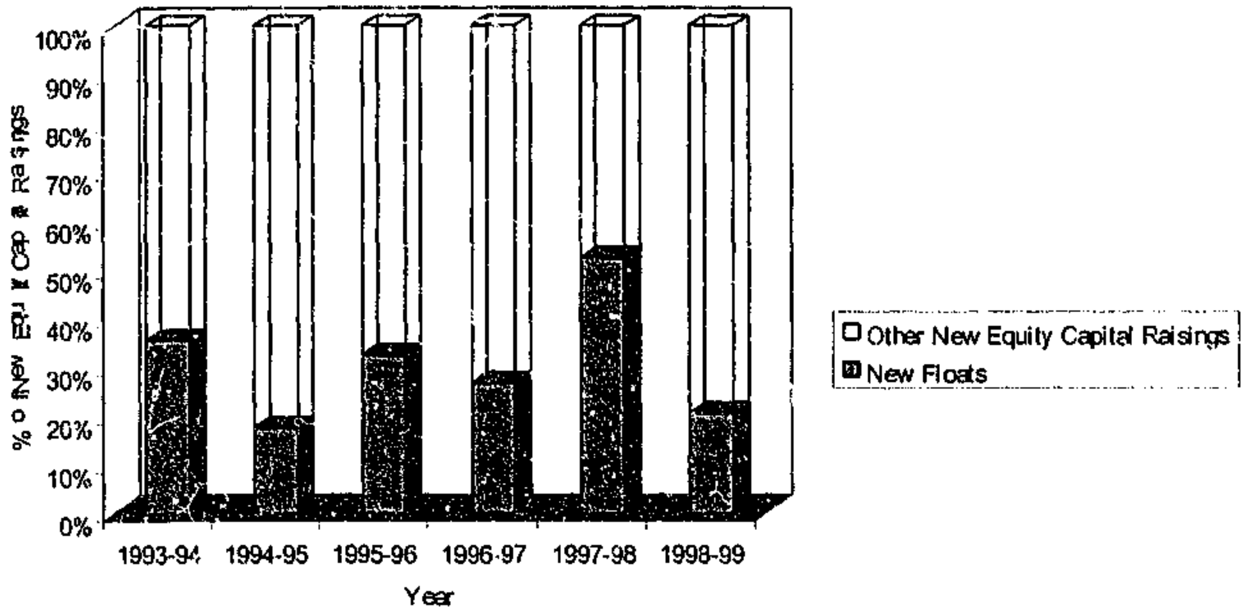


Figure 2.1: New Floats as a Percentage of New Equity Capital Raisings

Source: Figures based on 1999 Australia Financial Markets Report p. 7.

It is also useful to contrast movements of competing sources of funding in comparison with equity funding. From an issuers perspective, debt may be a cheaper alternative to issuing shares particularly if the circumstances are appropriate, for instance if the interest rate regime is favourable in contrast to the cost of equity. During the period 1990 to 1999, the general interest rate for business loans in Australia decreased significantly from around 14% in 1990 to 8% in 1999. It would not be unreasonable to expect that during this time, when interest rates were decreasing, debt funding would concomitantly increase given a reduction in the cost of servicing debt. Indeed, the level of debt funding between the periods 1993 to 1998 increased substantially from $67 billion to $114 billion. Interestingly however, this increase was less than the rate of increase in funding via new share issues over the same period. Figure 2.2 illustrates the level of funding attributable to new share issues in proportion to total funding.

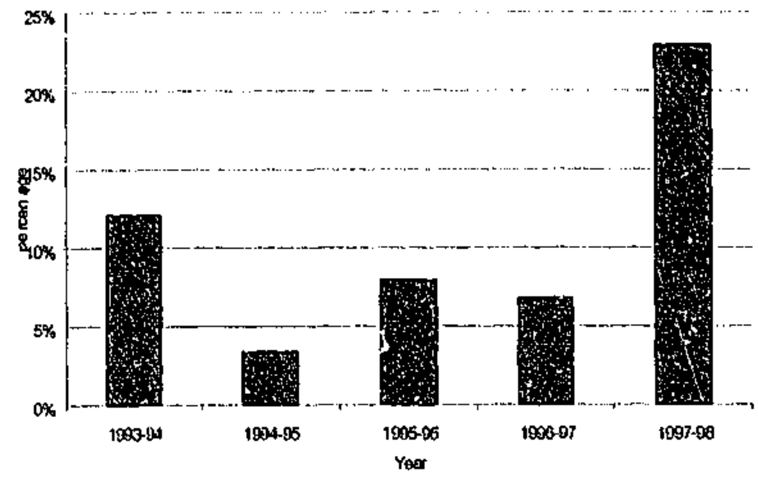


Figure 2.2: Percentage of New Share Issues to Total Financing

Source: Figures based on ABS - Australian Economic Indicators June 2000, p. 98.

It is also acknowledged however, that the privatization of a number of large entities previously owned (fully) by governments, together with the demutualisation of a number of large insurance companies, contributed substantially to the increase in funding from new issues. In addition, an increasing number of companies elected to go public instead of relying on funding from financial institutions, particularly during 1997 and 1998 as illustrated in Table 2.1.

Table 2.1: Number of New Listings and Listed Corporations on the ASX

	1995	1996	1997	1998	1999
New Listings	68	53	83	83	65
Listed Firms	1,186	1,184	1,198	1,227	1,226
Total	1,254	1,237	1,281	1,310	1,291

Source: ASX Annual Report 1999

Market commentators have suggested two possible reasons for an increasing interest in the equities markets in recent years:

- Channeling of household investments into equity investments, and
- Growth in venture capital for business expansion purpose.

2.2.1 Household Savings

Recent studies have shown that an increasing proportion of household savings are being channeled into equity investments relative to real estate and other financial investments (Institute of Applied Economics & Social Research - University of Melbourne, 1999). These increases have been partly attributable to the deregulation of the Australian financial system, and more recently, the deregulation of brokerage fees within the stock broking industry. Both of these factors have made markets more accessible as a viable investment alternative to the 'ordinary' investor. Other notable influences have been the introduction of mandatory superannuation in Australia, creating large pools of funds, which have been channeled into equity markets by large institutional investors. Figure 2.3 illustrates the proportional increase in equity investments relative to real estate and other financial investments.

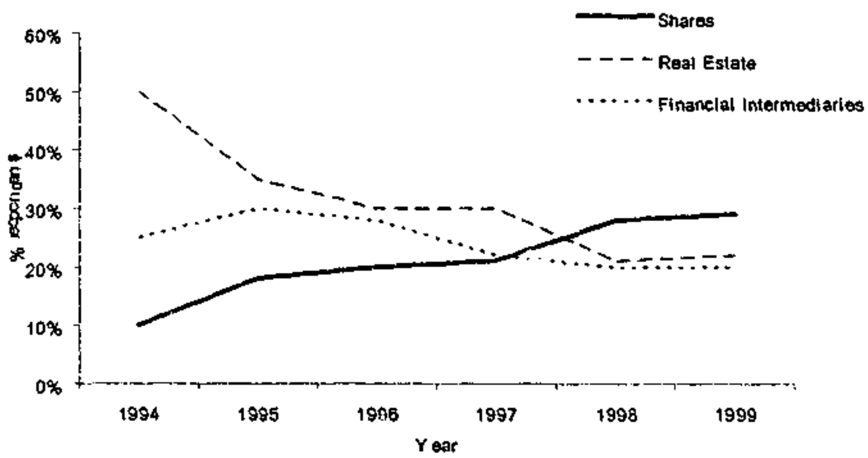


Figure 2.3: Home for New Savings

Source: ASX Annual Report 1999

It is also interesting to note in Figure 2.4, that both the commercial loan rate and the 10-year government bond rate are moving in exactly the opposite direction to the All Ordinaries Index. In part, this indicates that corporate funding strategies are merely responding to the demands of the market. That is, the higher the market index, the more tendency toward equity funding.

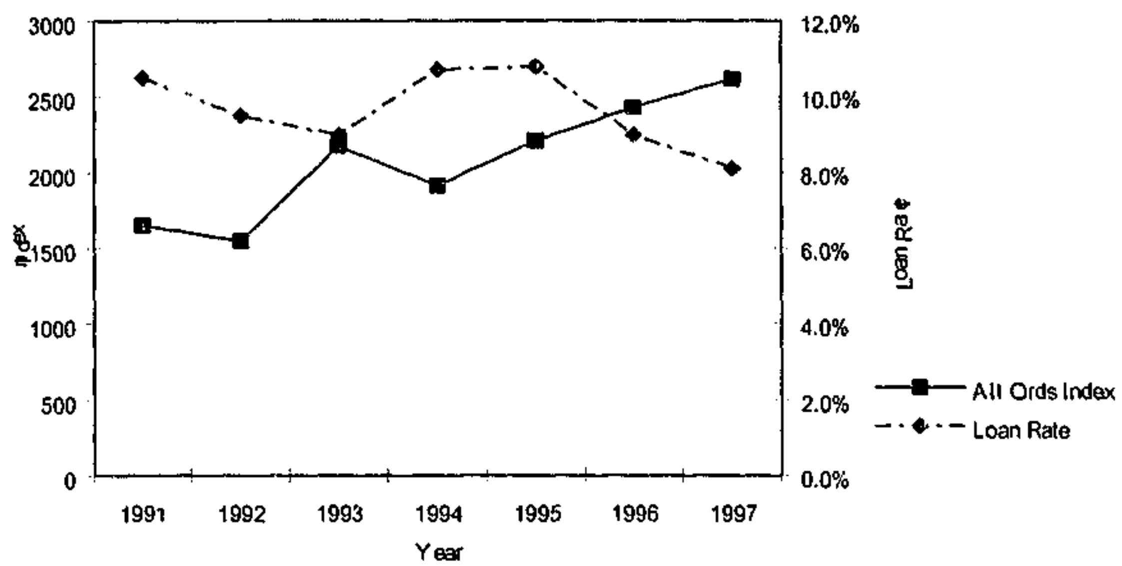


Figure 2.4: Share Index vs Commercial Loan Rate

Source: Australian Economic Indicators Fact Book, 1998 and 1999

2.2.2 Venture Capitalists

Venture capital is clearly becoming a major form of investment in Australia and is currently at record levels. Approximately 60% of venture capital in Australia is invested in New South Wales and Victoria, and the manufacturing and technology industries are the largest recipients of venture capital (Australian Venture Capital Guide 1999, p, 16). Table 2.2 illustrates the significant increase in venture capital activities over a 12-month period from 1998 to 1999. It is estimated that the Australian venture capital industry is collectively managing in excess of $5.6 billion and continues to increase each year (Australian Venture Capital Guide 2000, p.18).

Venture capitalists seek to generate attractive returns by selling their large shareholdings through private placements or by listing the investee company on the stock market. Some of the best examples of recent floats involving venture capital in Australia include Cochlear, ERG, and Austal Ships. Thus, from an IPO perspective, venture capitalists are an important influence in Australian IPO market, particularly as providers of funding support for several new floats every year.

Table 2.2: Investment activities of the Australian Venture Capital Industry

	1999	2000	% Change
Total No of Investments	781	989	26.6%
Comprising Current Portfolio Companies	489	648	32.5%
Completed Divestments	292	341	16.8%

Source: Australian Venture Capital Guide 2000

2.3 Rationale for Public Listing

The motivation for private companies seeking to go public via the listing mechanism is widely documented. Rock (1986, p. 193) identifies two principal reasons why companies enter the new issues market. The first reason relates to refinancing the firm by using external funds in contrast to internal funds. Under this scenario, existing founders and other holders of stock who have a considerable amount of wealth invested in the firm are seeking to liquidate and diversify their personal investment portfolios. A public listing is generally a far more simplistic route to 'off load' part or all of their investment, in contrast to selling shares back to the firm, which will need to finance the buy-back from valuable internal sources. Indeed, if the firm has a stable and profitable trading history and the market is opportune for quality investments, a public listing may well be a profitable exit strategy for existing holders of stock.

Secondly, public listing may be one of a limited number of sources of funds available to the firm seeking to finance new investments. Moreover, in some cases, involving substantial amounts of capital, it may be the only alternative. Notwithstanding, the flotation of a company is an attractive form of financing offering substantial benefits to the firm in comparison with other financing mechanism. For instance, with the exception of dividends (which are only payable at the discretion of directors), there are generally no servicing costs associated with equity. In contrast, other forms of finance, particularly debt, require regular repayments of interest and principal.

There are also many other benefits that accrue to the firm and stakeholders from going public, including ongoing access to large pools of costless funds via the capital market, increase in the profile of the firm, and a mandatory disclosure regime which provides a basic level of transparency and accountability (thereby reducing agency costs to the firm). Thus, from a macro perspective, new listings represent a significant source of finance for capital market participants (see Table 2.1).

From a family business perspective, the motivation to go public is documented in a small but nonetheless important body of literature, particularly in countries such as Italy, France, Germany and the U.S. where the family firm is the predominant vehicle for conducting business activity. The principal themes in the literature appear to focus on funding and succession issues, and usually in response to an underlying problem rather than entrepreneurial initiative. For example, existing owners may seek to go public because the firm is no longer able to finance continuing operations, or pursue growth future options (Harvey & Evans, 1995; Maherault, 2000). Specifically, there is no suitable family member that has the inclination or indeed the ability, in terms of managerial skills and other competencies, to drive and grow the firm.

The financial motives for family firms going public are not entirely unexpected given that lack of capital and significant debt levels are often cited as the primary causes for the failure of family businesses (Peterson, Kozmetsky, & Ridgeway, 1983; Wucinch, 1979; Jones, 1979; Aronoff & Ward, 1995). As mentioned above, listing can bring large sums of capital into the firm at a lower cost than servicing high levels of debt, which can be used for a variety of reasons including the strengthening of the existing capital base, the relaxation of debt burdens (e.g., by the expiration of debt) or the pursuit of entrepreneurial opportunities. Listing can also assist family firms in attracting potential successors through the appointment of professional managers on the basis of competence rather than family standing.

Other suggested reasons for family firms going public relate to the importance of firm profile in the success of the firm. Marchisio & Ravasi (2001), for example, argue that family firms "build and sustain competitive advantage through an increase in reputational and social capital" (p.1). Moreover they find that going public is increasingly driven by a search for greater visibility and profile, which in turn has beneficial effects on the capacity of firms to assess external resources and opportunities for entrepreneurial activities.

There are however, several potential disadvantages associated with public listings and these will need to be seriously considered (particularly in the cost-benefit trade-off analysis) by interested parties before taking this route. Perhaps one of the most documented disadvantages is the enormous cost involved in the initial listing process. The process of listing a company is normally lengthy and complicated, often involving many different parties, including representatives of the issuing firm, underwriters, financiers, auditors and corporate advisory specialists, lawyers, marketing experts, printers and various experts who might provide opinions on particular aspects of the listing. There are also numerous regulatory and compliance mechanisms to be observed including the requirement to prepare a detailed prospectus. In the US, Citizen (1977) provides evidence that the average cost of an issue is around 6.2% of total issue proceeds, and this cost is reduced the larger the issue. Aggarwal & Rivoli (1991) provide an analysis of the costs of going public for 'best-offers' and 'firm-commitment' issues during the period 1977 – 1987. They found a wide variation of costs ranging from 80% of gross issue proceeds in the case of small best-efforts offerings to 15% of gross issue proceeds of large firm-commitment offerings. Although the Australian evidence is sparse, Bruce, McKern, Pollard & Skully (1991) showed that the cost of a public issue in Australia varied between 2.33% and 7.46%

Other potential disadvantages arise from public exposure generally. A listed company in Australia is required to comply with several financial and other ongoing disclosure requirements. These include compliance with the listing rules of the Australian Stock Exchange and the various provisions of the Corporations Act. In addition to reporting requirements applicable to all relevant companies under the Act, listed companies must also comply with the 'disclosing entity' provisions of the Corporations Act (a disclosing entity is generally an entity that issues shares to the public via a prospectus). This means that listed companies must prepare comprehensive audited financial statements which comply with all relevant accounting standards and pronouncements on an annual and half-yearly basis. Moreover, these are ongoing requirements and for many companies compliance is onerous and expensive, often requiring the establishment of large accounting systems and specialist departments.

Other potential costs that may arise from greater public exposure are costs associated with competitors exploiting company information from detailed information disclosed in financial statements, and the potential costs of defending a takeover bid for shares in the company.

2.4 Procedural and Regulatory Aspects

A number of contributions in the literature make reference to structural differences between the Australian IPO environment and other countries, notably the US, where a number of different offer mechanisms are available for issuing firms. These differences have been advanced as possible reasons for reported disparities in the IPO stock price performance between comparable studies, particularly the study by Finn & Higham (1988) and Lee, Taylor & Walter (1996). Moreover, the study by Steen (1997) has proposed that changes to the regulatory environment during the observation period, influenced the extent of IPO underpricing in the post-legislative change period. To better understand the literature in these areas, a brief review of the issuing process and regulatory environment in Australia is provided below.

2.4.1 The New Issues Process – Australia

There are normally three parties involved in the issue of stock via an IPO medium; the issuing firm, the underwriter, and the initial investor. The issuing firm is a private company wishing to make the transition to a publicly listed firm by engaging in a new issue of shares. The underwriter, in addition to providing advice on the prospective issue, primarily guarantees the full subscription of the share issue. Note that it is not mandatory to engage an underwriter in Australia, although utilising the services of an underwriter appears to be in line with normal commercial practice and most new issues are underwritten. In the balance of this discussion therefore, it is assumed that an underwriter is involved in the listing process. Finally the initial investor (or subscriber) acquires the shares from the underwriter at the initial offering price.

In an IPO, the shares of the issuing firm, which have no prior market, are issued to the public for the first time. Before the issue however, the issuing firm and/or exiting shareholders, will normally engage in considerable discussions with underwriters and/or other corporate advisory professionals regarding the feasibility of the issue. These discussions would usually include numerous financial, legal and strategic matters, including (and not restricted to) the company's profile (history, financial performance and stability, projections of future growth, and funding requirements, positioning in the industry), management's capability, industry trends, market conditions and other matters that may impact on the future prospects of the issue.

After this point the underwriter or adviser will provide an estimate of the expected issue price based on a thorough evaluation of the company's information and market information relating to comparable issues of shares. The issuing firm, having decided that the projected benefits outweigh the costs, will proceed to negotiate the issue price and terms of the offer and then undertake to sell its shares by entering into an agreement with the underwriter. From this point, a detailed prospectus is prepared, usually by specialist advisors who ensure that the document complies with the Listing Rules of the ASX and the detailed provisions of the Corporations Act. The prospectus provides important information to investors regarding the IPO, including inter alia, information relating to the company, the issue price, the number of shares on issue, and the terms of the issue. It is important to note that the issue price and quantity of shares on offer cannot be altered during the course of the issue (although there are exceptions with the issue of shares by tender, for example the GIO float), and all shares must be sold before trading can commence on the exchange. This is an important difference compared with the requirements in the US, where the subscription price for shares can typically remain open until offers have been received from subscribers.

When the prospectus is finalised, it is immediately lodged and registered with the Australian Securities and Investments Commission (ASIC), and assuming all the requirements have been met and there are no false or misleading statements contained therein, the registration process is simply perfunctory. If however, ASIC fails to register the prospectus within a certain time period, the onus is on ASIC to establish that the prospectus is false or misleading or generally does not comply with the requirements of the Corporations Act. Registration may take up to seven or eight weeks before trading on the exchange commences. After the prospectus is registered, the issue is marketed to potential investors, typically institutional and private investors. Steen (1997) and Lee, Taylor, & Walter (1996) have identified discrete time periods between registration of the prospectus and the first trading day on the exchange, and argue that the ensuing time between these two events reflects the time taken to sell the issue. What this means is that, issues experiencing long delays have had difficulty in attracting interest from informed investors (Lee, Taylor, & Walter, 1996, p. 1193).

Finally, the dominant role of the underwriter in the listing process warrants further discussion here. As previously mentioned, the underwriter acts as adviser to the issuing company, but more importantly, the underwriter provides a guarantee that the issue will be fully subscribed. In this regard the underwriter assumes substantially all of the risks of the issue. However, underwriters are able to diversify this risk by involving other players such as brokers, financiers, large funds, institutional investors and other parties. Moreover, the underwriter's fees will normally be commensurate with the level of risk borne. Evidence in the literature suggests that underwriters will price the new issue to a level, which will ensure that the issue is not under subscribed (Reilly, 1978; Beatty, & Ritter, 1986; Baron, 1982).

2.4.2 Underwriting Contracts in the US

There are several different underwriting arrangements that are available to issuing firms in the US, however the more prominent amongst these is the 'best-efforts' and 'firm-commitment' contracts. The best-efforts contract is one in which the entire risk is borne by the issuer and the underwriter is engaged to sell as much of the issue as possible. However, the underwriter does not guarantee any of the issue and is not usually obliged to raise any minimum amount. A 'best-efforts' contract can thus be regarded as a simple 'commission-on-sale' arrangement, and is most likely used for issues that are categorised as high-risk.

In contrast, the underwriter in a firm-commitment contract effectively acquires the entire issue after the issuing firm and the underwriter agrees on the quantity of shares and the price. There are no further price adjustments and the issuer receives a fixed amount of funds for the issue.

2.4.3 Australian Regulatory Environment

A basic assumption in the theory of regulation is that economic markets are subject to imperfection which if left uncorrected will result in both inefficient and inequitable outcomes (Godfrey, Hodgson, & Holmes, 2000, p. 308). Information asymmetry (for instance between buyers and sellers) is well recognised as one of these imperfections that has the potential to cause market failure. Within this theoretical framework, the role of regulation is to protect the public interest by ensuring that markets are fully informed. This is particularly relevant to IPOs, since there is little if any known information about an issuing company prior to the issue of a prospectus. In essence therefore, investors have only one source of information upon which to make informed decisions regarding future investment. The prospectus is thus a critical link between the information contained in the prospectus and the investment decision. In this context, the need for regulations which ensure that investors have sufficient information to make informed decisions (about whether or not to participate in the purchase of securities) cannot be overemphasised.

Several contributors to the literature discuss the signalling effect of specific information contained in prospectus documents; particularly in respect to the quality of the firm (Menon & Williams, 1991; Leland & Pyle, 1977; Banz, 1981). More recently, Steen (1997) showed that changes to the prospectus provision which enhanced the quantity and quality of information supplied to the market, resulted in lower underpricing of Australian IPOs. These studies will be further discussed in Chapters 3 and 4.

The Australian regulatory environment for IPOs is characterised by a combination of statutory provisions and regulations imposed by the Corporations Act 2001 (and associated ASIC pronouncements), and the contractual obligations between the Australian Stock Exchange Ltd and its listed members via the ASX listing Rules. Prior to 1991, legislation which regulated equity raisings included the Companies Act 1981 and before this time, the Companies Act 1961. These requirements will be briefly discussed below.

2.4.3.1 Corporate Law

Prior to 1991, equity raising via the public route was regulated by the Companies Act 1961 and then subsequently by the Companies Act 1981. Both of these Acts provided a rigorous prescriptive regime whereby the regulations to the various sections of the law provided comprehensive schedules of detailed information required to be disclosed in the prospectus. Also, the prospectus was reviewed and pre-vetted before registration by the Australian Securities Commission.

In 1991, the various acts of parliament that regulated companies (state and federal) were consolidated into one federal act, which became the Corporations Law. A major change introduced by the new law was the repeal of almost all of the former provisions relating to prospectuses and the inclusion of a general provision relating to information to be included in the prospectus. Section 1022(1) of the Corporations Law required the prospectus to contain

> "...all such information as investors and their professional advisors would reasonably require, and reasonably expect to find in the prospectus, for the purpose of making an informed assessment of the following:
>
> a) The assets and liabilities, financial position, profits and losses, and prospects of the corporation; and
>
> b) The rights attached to the securities."

It is noted that these changes preceded the collapse of a number of high profile companies in Australia following the effects of the 1987 stock market crash. It could be argued that these changes were introduced during a time when concerns for public interest were running high. Nonetheless, Steen (1997) has argued inter alia, that these changes to the law represented more stringent requirements compared to the former provisions contained in the Companies Act 1981, which ensured greater quality disclosures, less uncertainty and therefore less underpricing. His findings showed that changes to the Corporations Law had a significant influence on underpricing. This study tests some of these findings in the context of family and non-family controlled companies.

2.4.3.2 Stock Exchange Listing Rules

Listed companies in Australia are required to comply with the ASX Listing Rules. The rules vary for different types of companies, for example High Technology and Mining Companies. Essentially, they require companies that issue shares to the public to prepare a prospectus or information memorandum. Once listed, there are also annual and continuous reporting requirements for member companies and other listed entities.

2.5 Summary and Conclusions

This chapter briefly considers the role and significance of IPOs in Australian capital markets and the rationale for public listing. The procedural and regulatory regimes underpinning the listing process are also considered and contrasted against international counterparts, particularly the United States, where listing and underwriting processes are appreciably different to those in Australia. Consistent with most modern economies, the listing process in Australia is a lengthy and expensive procedure driven by a complex regulatory regime requiring compliance with detailed legal and institutional listing procedures.

Chapter 3: Review of the Literature

3.1 Introduction and Background

Given that this study is concerned with family business and IPOs, both of which are quite separate research disciplines, the review of the literature is divided as follows:

Part 1: Definition of Family Business & Related Issues
Part 2: Agency Theoretic Perspectives
Part 3: Initial Price Performance Literature
Part 4: Aftermarket Operating Performance Literature

Part 1 commences with a discussion and review of the major definitional problems associated with the term 'family business', including the implications of definitional diversity, and then progresses to a detailed review of the family business literature. Numerous definitional issues are examined in terms of their relevance to the current study, including ownership and control criteria, issues of dominance, definitions of family business in the context of listed entities, and important criteria for defining a controlled entity. The review reveals a surprising lack of consensus on the definition of family business, and the association between ownership concentration and firm performance. Finally, *Part 1* provides a definition of family business that is used in the study.

Part 2 provides a discussion on the development of agency theory from its derivation in classical economic terms, to its current form as a popular micro economic theory in the literature. The rationale for adopting an agency theoretic perspective in the current study is explained along with the linkages between firm performance and the alignment between ownership and control of the firm.

Part 3 is concerned with the initial pricing performance of IPOs both internationally and in Australia. A description of the underpricing phenomenon is provided as well as a synthesis of potential causes of underpricing. A summary table of the major contributions to the literature is provided in Appendix 2. The literature demonstrates that underpricing is well documented in most modern economies.

Part 4 discusses the literature covering aftermarket performance of IPOs in the long-term from a share-returns performance perspective, and from an operating performance perspective (based on accounting variables). Market efficiency issues are also briefly discussed along with some coverage of agency theory. Extant literature provides evidence that in the long term, IPOs underperform using both share price and accounting variable models. Part 4 also provides brief coverage of a growing body of literature that examines the effects of failure factors on IPO performance. The underlying theme is that survival of the firm in the aftermarket is directly dependent on the financial health of the firm before going public.

3.2 Part 1: Definition of Family Business & Related Issues

3.2.1 Introduction

It is noted that whilst a diverse literature exists in the area of family business, this study focuses primarily on major studies, or parts thereof, that have contributed to the issue of defining a family business. Indeed, one of the most striking features of the extensive literature is the apparent lack of definitional consensus. Sharma, Chrisman and Chua (1996) provide an authoritative synthesis of the various contributions to definitional issues, citing some 34 different definitions in their survey.

3.2.2 Family Business Research – Definition of Issues

Definitional diversity is well documented in the family business literature (Neubauer & Lank, 1998; Schillaci & Faraci, 1999; Shanker & Astrachan, 1996; Upton, Vinton, Seaman, & Moore, 1993), and calls for a reconciliation of the commonalities within the various definitions proposed (Lansberg, Perrow, & Rogolsky, 1988; Wortman, 1994) have seemingly and regrettably failed. A number of authors have also attempted to define a family business using a dimensional or structured approach. For example, Shanker & Astrachan (1995) provide three broad dimensions of a family business, Litz (1995) provides both a structured-based approach (which considers family ownership and management) and an intention-based approach (which considers value preferences of upper level management) in defining a family business, while Handler (1989) proposes a broad conceptual framework for defining the family firm. Handler's model is of interest in this study, since it comprises four dimensions in which many of the different definitions of a family business can be initially classified;

- Degree of ownership and management by family members;
- Interdependent subsystems;
- Generational transfer; and
- Multiple conditions.

3.2.2.1 Degree of ownership and management by family members,

Essentially, this dimension requires that family members have a minimum level of ownership and be involved in the management of the business. An examination of the 34 definitions of family business identified by Sharma, Chrisman and Chua (1996), reveals that 22 fall within the ownership/management dimension and 17 include some degree of ownership as being an essential component. A predominant focus on ownership as a key attribute is not unreasonable to expect, given that the literature has identified ownership as a critical variable and an essential part of the production function of the firm (Jensen & Meckling, 1976; Khan & Rocha, 1982 in Gallo & Vilaseca, 1998). According to Gallo and Vilaseca (1998), ownership, together with productive and technology resources, influences company performance.

Major contributors to the definition of a family business within the ownership and management dimension include Barry (1975), Barnes and Hershon (1976), Alcorn (1982), Dyer (1986), Pratt and Davis (1986), Upton and Sexton (1987), Babicky (1987), Lansberg, Perrow, and Rogolsky (1988), Gallo (1988), Dreux (1990), Ward (1990), Donckels and Fröhlich (1991), Gallo and Sveen (1991), Lyman (1991), Welsch (1993), Covin (1994), Fiegener, Brown, Prince, and File (1994), Gallo and Vilaseca, (1998), Smyrnios, Tanewski, and Romano (1998), and Schillaci and Faraci (1999). A brief review of their contributions (in chronological order) is considered in the following paragraphs.

Barry (1975) analysed the organization structures of family businesses and defined family business as an enterprise in which the members of a single family have control over the business. This definition however, is premised on ownership, since the prerequisite for control of the business is the ownership of shares by one family, either in the private or public company context. In this definition, the majority ownership of shares by the family gives rise to control of management decisions.

Barnes and Hershon (1976) examined the often difficult and detrimental process of transferring power from one generation to another in the typical family business. In this study, the family business is generally defined as a firm in which the controlling interest is owned by an individual or by members of a single family. The authors further argued that this definition alters as the business makes the transition from a family-based management to a professionally- based (outsiders) management.

Alcorn (1982) provides a diverse definition of family business in the context of the ownership and structure of profit-making concerns. In this regard, sole-proprietorships and partnerships are defined as family businesses. Companies would also qualify as family businesses if the family owns the controlling interest in the shares of the company and is also involved in operating the business.

Dyer (1986) provides three broad definitions of a family business; first, as an organization in which decisions regarding ownership or management are influenced by a relationship to a family or families. In this definition, ownership and management can either be totally or partially in the hands of one single family. Dyer's second definition refers to the 'absentee-owned' firm where non-family managers may actually operate the business, but any decisions regarding ownership are made only by the owning family. The third definition relates to one family member who directs the business and no visible involvement by other family members. Dyer refers to this definition as the 'latent' family firm and proposes that this position changes as new generations demand involvement in the business over time. In turn, this shift in management changes the dynamics of the relationship between the firm and the family.

In their extensive statistical analysis of family-owned and home-based businesses, Pratt and Davis (1986) define a family business as one in which a single family has ownership control. Interestingly, the authors define a family business as one in which two or more extended families influence the direction of the business through the exercise of kinship ties, management roles or ownership ties.

Upton and Sexton (1987) examined succession issues and in particular, the opportunities for daughters in the succession process in family business. They defined a family business as one which includes "two or more relatives and has at least two generations working together in an operating capacity" (p. 316)

Babicky (1987) provides a detailed account of the practical issues that confront family business from a consultant's perspective. While the author does not articulate a specific definition of a family business, some reference has been made to the genesis of a family business. Typically this includes a business which is started by one or more individuals, who then nurture the business through the growth and subsequent stages of development during which time a majority ownership is maintained.

In a brief editorial comment on the growing importance of family businesses and family business research in the US, Lansberg, Perrow, and Rogolsky (1988), identify a commonly used definition of family businesses as those "in which the members of a family have a legal control over ownership" (p. 2).

Dreux (1990) proposes a conceptual framework for the examination of the various financial alternatives available to the family business, and in particular, the practical alternatives to the 'sell or go public issue'. In this context, the family business is defined as an enterprise controlled by one or more families. More importantly however, the author provides a general definition of control, which is considered to be "a degree of influence in organizational governance sufficient to substantially influence or compel action" (p. 226). This definition is of relevance to the current study, since the primary definition of a family business that will be articulated, is based on the notion of control by a single individual in conjunction with other family members.

Ward (1990) attempts to provide a conceptual definition of a family business and examines the strategic differences between family and other general businesses. He defines a family business as one in which two or more family members influence the business.

In their 'STRATOS' project (strategic orientations of small and medium enterprises), Donckels and Fröhlich (1991) examined the characteristics of small-scale family businesses in the context of the environments in which they operate, that is, in and outside the family circle. Family businesses are defined as firms in which one family holds the majority of shares and controls the management of the business.

Gallo and Sveen (1991) examine the internationalization of family business and find that these businesses are more rigid in their internationalization processes than other non-family businesses. A family business is defined as one in which a single family owns the majority of stock and has total control. Moreover, members of the family are involved in the management of the business and make important decisions.

Lyman (1991) examines customer practices in the family business environment in contrast to a non-family business environment. To be included in the sample of family firms, the ownership of the firm had to be retained by family members. Furthermore, at least one family member had to be involved in the business with the support of other family members on a regular basis, whether or not these members were formally engaged in the management.

Welsch (1993) defines a family firm as a business in which ownership is retained by members of the owner's family or his relatives, who also had to be engaged in the management decision making processes. In this definition, it was not essential that the 'owning' family had exclusive ownership of the firm. They must however, have had legal control of more then 50 percent on the stock of the firm. Moreover, the requirement for family involvement in the firm was satisfied when at least one family member engaged in either the management board or the supervisory board.

In studying student perceptions of family-owned firms, Covin (1994) employs a conventional definition of family-owned firms, that is, those firms that are "owned and operated by a family that employs several family members".

Fiegener, *et al.* (1994) study successor development processes in family and non-family businesses and classify family businesses as those controlled by the owning family. This definition also requires the next generation that is expected to be *in charge* of the business, to be currently engaged in the management of the business and be related to existing (official) leaders.

Gallo and Vilaseca (1998) examine the performance of CFO's of family and non-family businesses in the context of agency theory. They define a family business as a business in which one family owned the majority of stocks, members of the family were involved in the management of the company and the owners had a desire to transfer ownership to future generations.

Smyrnios *et al.* (1998) aim to develop a reliable and valid measure of family business against a background of extensive definitional diversity in the literature. The definition of a family business adopted by the authors is challenging, requiring that one of four possible criteria be satisfied, viz; that 50% or more of the ownership (presumably of the capital) of the business is held by a single family; or 50% or more held by multiple members of a number of families; or a single family group controlling the business; or, a significant proportion of the management is drawn from the same family. The authors cite support for this definition from Stoy Hayward and the London Business School (1989, 1990) and Litz (1995).

Schillaci and Faraci (1999) examine corporate performance objectives and techniques of value management introduced into family businesses where changes in ownership, governance mechanisms, and decision-making processes occurred via private equity managers. The definition of family business employed is based on ownership and management concentrated within a family unit.

Many of the above studies make important contributions in the seemingly tireless search for an elusive definition of family business. The more significant of these, particularly in terms of providing a measurable definition, are those that focus on control, significant influence, and ownership. While it is noted that many of these definitions above are developed to suit the specific purpose of the respective research effort, the current study utilises aspects of some of these contributions in an attempt to provide a definition of a family business which is sufficiently robust for the purposes of capital market research.

Two specific contributions are worth noting because of their direct relevance to the current study. First, the editorial comments by Lansberg *et al.* (1988) relating the reasons for the sparse research effort on family business are noteworthy. The comments that "much of the confusion about the extent of family control derives from the fact that mechanisms used by families to exert their influence over management (voting, trusts, foundations, holding companies) are deliberately designed to keep the identities of shareholders hidden" (p. 3), is particularly relevant to this study's reliance on the meaning of 'control' as defined in an existing Australian Accounting Standard (AASB1024). Moreover, this view is consistent with the sentiments expressed by practitioners in a survey undertaken in support of this study (see Chapter 5). These views highlight the hazardous problem of using ownership as a sole criterion for defining a family business.

Second, the study by Barnes and Hershon (1976), which, inter alia, identifies the complex power struggles between old and new generations in the power transference process, is also relevant to the discussion on control. A key aspect of this study is the recognition that dominant individuals are at play in the power transference process, and have significant influence in final outcomes (see Chua, Chrisman, & Sharma 1999, and more particularly their reference to 'dominant coalition', p. 24). Without the existence of dominant individuals influencing the dynamics of the family business, the chances of some family businesses surviving are significantly diminished. Chua *et al.* (1999) for instance, argue that the essence of a family business is a vision developed by a dominant coalition which shapes and pursues the vision in a way that it is "potentially sustainable across generations of the family" (p. 25). It is also interesting to note that the appearance of dominance by specific individuals is regarded as an important factor associated with firm value. For instance, McConaughy (1994) observed that the identity of the owner-manager is more important than the level of ownership (p. 5). Indeed, Berglof and von Thadden (1999) suggest that most firms (even listed) in the world have a dominating owner and in most cases a family or the state holds such a dominant stake.

Several of these views are consistent with evidence provided by 20 accounting practitioners randomly selected to partake in an interview for the purposes of this study (see Appendix 3). It is observed that most businesses owned by a family or a group of families, have at least one dominant individual steering the course of the business. The participation of a dominant individual in the family business is an important aspect of the current study, since the definition of family business used is based on 'control', which in turn is defined as the 'capacity to dominate decision making' (see AASB1024, paragraph 9).

It is also worth noting that the importance of dominance in respect to the performance and success of firms is acknowledged in the literature. Neun and Santerre (1986) for example, find that the existence of dominant shareholders increases the value of the firm. They observed that the profitability of the firm increases as the number of shares held by the dominant shareholders increase. They also provided a scale of ownership concentration, which demonstrates the minimum and maximum levels of ownership required to influence managerial decisions. Zeckhauser and Pound (1990) also found that the existence of dominant shareholdings increases the value of the firm because of the shareholders' more effective ability to monitor firm performance. In other words, large shareholders have the propensity to act as monitors and thereby reduce agency costs

Morck, Shleifer, and Vishny (1988) observe similar findings in their study of the relationship between large shareholdings of directors and the market value of the firm. Using 'Tobin's q' as a measure of performance, they found a positive association between the levels of director's ownership beyond 25% and higher. Broadly, Tobin's q is a function of the value of a firm's assets relative to the replacement cost of those assets. Generally therefore, higher Tobin's q values reflect higher firm performance.

Kim and Lyn (1988), Wruck (1989), McConnell and Servaes (1990) and Chen, Hexter, and Hu (1991) also report positive associations between 'insider/concentrated' ownership and high Tobin's q value. However, Holderness and Sheehan (1988) found no significant association between performance based on Tobin's q, compared with a matched set of 114 diffusely-owned firms on the New York and American Stock Exchange.

3.2.2.2 Generational Transfer

Definitions within this dimension focus on control of the business passing to younger members of the family over time. This dimension was an essential part of the definitions of family business in Churchill and Hatten (1987) and Ward (1987), which are briefly considered below.

Churchill and Hatten (1987), provide a research framework for examining non-market based transfers of power and wealth in family businesses. They define a family business in terms of the ability of younger members to assume control of the business from outgoing older members. The choice of the successor and the transfer of power are at the core of the family business.

In his monograph on *Keeping the Family Business Healthy,* Ward (1987) defines a family business as "one that will be passed on for the family's next generation to manage and control" (p. 252).

3.2.2.3 Interdependent Subsystems

Definitions within this dimension focus on a systems approach in specifying a family business and are briefly discussed below.

Beckard and Dyer (1983) examine succession issues in the quest for continuity in the family business. Family business is defined in terms of a number of subsystems including the business itself, the family, the founder of the business and the board of management which links the systems.

Davis (1983) provides a theoretical framework, which explains the continued vitality of a family business despite social, psychological and organisational obstacles. It is proposed that an understanding of the source of this vitality provides an "effective context for managing change". Davis (1983, p.49) defines family businesses as "those whose policy and direction are subject to significant influence by one or more family units" (Davis, 1983, p.47). Moreover, this influence is exercised through ownership and participation of family members. The interaction between the family and business constructs establishes the character of family business and defines its uniqueness.

3.2.2.4 Multiple Conditions

Definitions within this dimension propose that a diverse range of attributes are required to define a family business, including ownership, involvement in the day-to-day management of the business, generational transfers and links, family influence and family control. Astrachan and Kolenko (1994) and Astrachan and Shanker (1996) include a combination of ownership and control, family involvement, and generational transfer in their definitions. Donnelly (1964) includes generational transfer and family influence in the definition of a family business. Litz (1995) and Rosenblatt, deMik, Anderson, and Johnson (1985) include ownership, and family relatedness as important attributes in defining a family business. These contributions are briefly considered below.

Donnelly (1964) studies the interrelationship between business and family in 15 successful family companies. Family business is defined as a business where at least two generations of the family play an important role in the business in terms of influence on company policy which is to some extent mutually beneficial to family members. Donnelley further provides the circumstances in which these relationships exist.

Rosenblatt *et al.* (1985) define family business using multiple definitions, viz; all businesses owned or controlled by a single family with at least two family members engaged in management of the business. Should only a single-family member be involved, his/her management contribution would be influenced by other family members.

Astrachan and Kolenko (1994) examine over 600 family firms to study the impact of human resource management and professional governance on family business success. They define a family business using five criteria. First, for public firms, more than 10 percent of the business must be owned by family members and more than 50 percent in the case of private firms. Second, more than one family member works in the business, or the owner anticipates passing the business to the next generation, or the owner identifies the business as a family business. Third, the business must have at least 10 employees. Fourth, the business must have more then two million dollars in revenue annually and last, the business must have been operating continuously for at least 10 years.

Litz (1995) establishes two different conceptual approaches in defining a family business; the structured-based approach, which considers family involvement in firm ownership, and management, and an intention-based approach, which considers managements realized, and unrealized value preferences. Based on the integration of these two concepts, Litz (1995) proposes "a business firm may be considered a family business to the extent that its ownership and management are concentrated within a family unit, and to the extent its members strive to achieve and/or maintain intra-organisational family-based relatedness" (p. 101).

Astrachan and Shanker (1996) attempt to validate statistics in the literature relating to family businesses in the U.S., in particular statistics pertaining to size of the family business universe, contributions to GDP, and family business employment. Three definitions of a family business are provided. First, the 'broad' definition which requires that family members have effective control of strategic direction and control is intended to remain in the family. Second, the 'middle' definition in which the company is operated by the founder who also has legal control over voting stock. Third, the narrow definition where multiple generations are involved in the business (running and owning) and more than one member of owning family has significant management responsibility.

3.2.3 Listed Family Businesses

A limited number of studies have provided a definition of a family business in the context of capital market research. This section includes a brief discussion on the definitional aspects of these studies and emphasises their relevance to the current study, particularly the study by Burch (1972).

Burch (1972) examined the top 300 manufacturing and 50 merchandising and other companies based on the 1965 *Fortune 500* list, to determine the number of firms that were family controlled. He found that more than 47% of these publicly held firms were controlled by families. Burch's definition of family business falls within Handler's (1989) classification of 'multiple conditions'. He uses the following criteria to define a family business:

1. Between 4% to 5% or more of the voting stock must be held by a family or group of families or one (affluent) individual;
2. Family representation on the board (inside or outside) over time.

Based on the 1992 *Fortune 500* list, Jetha (1993) examined the link between senior management in the company (directors, owners, key officers) and the original founders of the business. Jetha's definition of a family business is one in which a member of the current senior management is linked (at least to second generation level) to the founding family. This definition is consistent with Handler's (1989) generational transfer categorisation. Jetha found that 37% of the largest publicly held companies are family-run operations.

Along similar lines to Jetha (1993), McConaughy (1994) found that 21% of publicly held companies on the *Business Week 1000* list were family businesses. He defined a family business as one in which the CEO, President or Chairman is a descendant of the founding family. As in the Jetha (1993) study, this definition is consistent with Handler's (1989) generational transfer categorisation.

3.2.4 Definition of Family Business Adopted in This Study

Given the definitional diversity described above, this study focuses on those definitions and concepts that not only have commonality in the literature, but also more importantly, have the support of authoritative bodies. These include the various bodies representing the accounting profession and corporate regulators, such as CPA Australia, the Institute of Chartered Accountants in Australia, and the Australian Securities and Investments Commission. The rationale for this approach is that a definition of family business based on concepts and definitions that already have independent authoritative support, has the propensity to attract credibility and ultimately general acceptance amongst scholars and practitioners. In this respect, the definition of 'control', as embodied in Australian Accounting Standard AASB1024 – Consolidated Financial Statements (hereafter, AASB1024), has particular appeal in this study, since parallels can arguably be made between this definition and one of the more significant characteristics which delineates family firms from non-family firms, i.e., dominance of decision making by one individual.

For instance, AASB1024 defines control as "*the capacity of an entity to dominate decision-making directly or indirectly, in relation to the financial and operating decision of another entity*". Moreover, the definition of 'entity' in the standard includes a 'person'. The link in all of this is that the capacity to dominate and indeed, the exercise of dominance by an individual in relation to operating and financing decisions, is recognised as a critical feature in family firms and, perhaps more importantly, is often required to ensure the survival of the family firm (see Barnes & Hershon, 1976; Chua, Chrisman & Sharma, 1999; McConaughy, 1994; and Neun & Santerre 1986). The issue of dominance by an individual in family firms was also given considerable support in the results of a survey of technical (accounting) specialists and practitioners undertaken as part of this study (see Section 5.3.2.5 below). For instance, the results show that the importance of dominance in family firms was rated as highly significant by 96% of respondents, and almost all respondents rated 'ownership', 'control', and 'management structure' as highly appropriate attributes of family firms. (see Table 5.2, Section 5.3.2.5).

There are also other potential reasons why the use of a 'control' criterion in defining a family firm has theoretical appeal. For example, several contributors to the family business literature have already identified 'control', particularly in respect to operating and financial decisions, as an important element in defining the family firm (Alcorn, Barnes & Hershon; 1976, Landsberg, Perrow & Rogolsky, 1988; Dreux, 1990; Donkels & Fröhlich, 1991; Gallo & Sveen 1991; and Fiegener, Brown, Prince & File, 1994). Moreover, there are parallels in the literature relating to the definition of family firms and the genesis of AASB1024 as an accounting standard. For example, Landsberg et al, (1988) argue that the difficulties in defining family firms (based on ownership) are attributable to mechanisms used by families to keep the identities of shareholders hidden (p.3). This is a significant point and is arguably one of the main reasons which brought about the introduction of AASB1024, i.e., the inability to determine the relationship between two entities (parent and subsidiary) based on an ownership test. Thus the definitions developed in AASB1024 which provide the framework for identifying controlling interests can also have application in a family firm context. Perhaps at this point, further coverage explaining the rationale for the introduction of AASB1024 and its relevance to this study is warranted.

In the context of Australian financial reporting requirements prior to 1986, the ownership of 50% of the ordinary shares in a company was used as the artificial cut-off point for determining whether a company qualified as a subsidiary. Thus if 50% or more of the ordinary shares of company were owned at balance date (that is, the date for preparing financial statements), the provisions of the Companies Code (now the Corporations Act) were invoked requiring the parent company (holder of the shares) to incorporate the results and the assets, liabilities and reserves of the subsidiary in its own financial statements. Briefly, this means that the parent entity has a legal obligation to fully reflect the financial statements of the subsidiary within its own financial statements. This process is generally referred to as a consolidation of the financial statements and is intended to provide useful financial information on a 'consolidated' basis to interested parties. These requirements seemed simple enough and the ownership test was evidently quite acceptable to the accounting fraternity for many years.

However, over the past 10-15 years a number of sophisticated corporate vehicles have emerged against a background of complex taxation, corporate and other regulatory environments. Trusts and a variety of other interposed entities were commonly used for these purposes. These developments were exacerbated by an aversion for detailed financial disclosures and accordingly created some difficulties in using the ownership test for consolidation purposes. For instance, when a reporting entity in legal terms owns less than 50% of another entity, but in substance controls the affairs of that entity, should the reporting entity consolidate the financial statements of the controlled entity? Alternatively, if the reporting entity owns greater than 50% of an entity, but in substance has no control whatsoever of the affairs of that entity, should it consolidate the financial affairs of an entity it has no control over?

The accounting profession addressed these difficulties by issuing Australian Accounting Standard AASB1024 – Consolidated Financial Statements, which requires controlled entities to be consolidated regardless of the level of ownership of these entities by the parent. While the issue of consolidating a subsidiary into the accounts of a holding entity is not the focus of this study, it does illustrate the difficulty in using ownership as a definitional criterion and provides parallels in developing a definition for the term "family business". Given the themes adopted above, there are persuasive arguments for using 'control' as one of the important criteria for defining a family firm. Thus, this study adopts, in part, the control criterion promulgated by the Australian accounting profession in AASB1024, for consolidating an entity, in determining the existence of a family business. This study also takes cognisance of the evidence in the literature which indicates that control and ownership of family businesses are non-diffuse and typically, there is an ownership structure in which shares are *closely held* by family members (Jensen & Meckling, 1976). Given the above discussion, in this study, a family business is defined as ***an entity controlled by a private***

individual, directly or indirectly, in conjunction with close family members. Moreover, in this study, control is broadly defined as the *capacity to dominate decision- making*. Chapter 5 provides a detailed description of this definition of family business together with a framework for operationalising various aspects of the definition for the purposes of Sections 2 and 3 of the study.

3.2.5 Conclusion and Summary – Part 1

As discussed in the introduction to this chapter, this study examines the main contributions in the literature relating to the definition of the term 'family business' and other surrounding issues. Moreover, a new definition of a family business has been proposed, based on control, dominance, and continuity of control by family members. This definition draws heavily on the definition of control in AASB1024 and common definitional concepts identified in the family business literature. Appendix 1 summarises the main contributions to the definition of a family business in the literature.

3.3 Part 2: Agency Theoretic Perspectives

3.3.1 Introduction

In the foregoing discussion, it was noted that many definitions of family business rely on ownership and/or control as key attributes in determining the existence of a family business. Moreover, several of these definitions identify an alignment between ownership and control which family businesses enjoy (Gallo & Villaseca, 1998, p. 36). This is an important issue in any study of family business since the extent of the ownership and/or control in the business may be a critical factor in determining the success or otherwise of the business. Fama and Jensen (1983) have demonstrated the importance of family relationships in reducing agency costs and the influence of ownership and control variables in the success of the firm. It would follow therefore, that some underlying theory regarding the ownership structure and the distribution of control in the firm should be examined in any study of family business. Accordingly, this chapter provides a brief review of the agency theoretic perspective on family business, particularly the link between the alignment of ownership and control, and firm performance.

3.3.2 Theory of the Firm

The *theory of the firm* provides, in part, some explanations of the capital/ownership structure of the firm, and the nexus between this structure and corporate governance mechanisms, which are operationalised via the distribution of management control. The literature on the theory of the firm is briefly considered in the following paragraphs.

The general theory of the firm is well documented in the economics literature and perhaps dates as far back as the 1700's with the classic works of Adam Smith (1776). In *The Wealth of Nations*, Smith (1776) identifies the essential factors of production, the importance of specialisation, economies of scale in the production process, the separation of ownership and control phenomenon, and the role of the director (manager) in the joint-stock company. The genesis of the more specific theory of the firm, now more commonly known as the *micro-economic theory of the firm*, is arguably attributable to the contributions of both Berle and Means (1932) and Coase (1937). These contributions further developed the theory of the firm by focussing specifically on the micro-economic (internal) attributes of firms, particularly the role of the entrepreneur, the relationship between key drivers within the firm (viz; managers, stockholders and debtholders) and their utility functions, and the contractual relationships and costs of the firm with suppliers and consumers of factors of production. Indeed, Coase (1937, p. 391) proposed that the reasons why firms exist are to greatly reduce contracting costs.

Berle and Means (1932) were also instrumental in highlighting the diffuseness in ownership structure (via changes to the link between ownership and control) and the consequent impact of this diffuseness on profit maximisation. In their publication *The Modern Corporation and Private Property*, Berle and Means (1932) imply that a positive correlation exists between ownership concentration and operating performance of the firm.

The work of Berle and Means (1932) and Coase (1937) has been credited in the literature as the foundation for what is now known as 'agency theory'. Agency theory is generally concerned with the relationship between the agents (managers) of a firm and its principals (viz; shareholders and debt holders), and the contracting process and costs relevant to these parties. Since each of these parties are regarded as utility maximisers, the principals of the firm will incur agency costs in ensuring that the interests of the agent are aligned with those of the principals. Agency costs have been defined in a classic paper by Jensen and Meckling (1976), and include those costs incurred in monitoring the behaviour of agents (monitoring costs) and those incurred in guaranteeing that the agent will act in the interests of the principal (bonding costs). Other residual costs associated with the non-alignment of the interests of the agent and the principal (residual losses) are also included in the definition of agency costs.

3.3.3 Agency Theory and the Family Business

There is an increasing popularity of agency theory explanations for firm performance (McConaughy, 1994), particularly in the context of ownership structures (concentrated or diffuse), and their association with firm performance. Agency theory is of relevance to the current study since it might provide the basis for explaining differences in the level of IPO underpricing and long-term operating performance between family and non-family businesses. The rationale here is that agency costs will be lower in firms that have a higher proportion/concentration of ownership and where the owners exercise greater control in the operations of the business compared to firms in the reverse circumstances. The reduction in agency costs will concomitantly result in higher operating performance. Similarly, an IPO firm in which the existing owners retain a significant level of ownership and control (post listing), may provide positive signals to the market regarding future operating performance and cash flows. In turn this may indicate less uncertainty and greater stability regarding the future of the firm and thus a higher market value post listing (How & Low, 1993; Allen & Faulhaber, 1977).

Alchian & Demsetz (1972), and more notably Jensen & Meckling (1976) are amongst the first within a movement of contributors who developed agency theory in its current context. While Alchian and Demsetz (1972) focused on the important role of monitoring contracts in joint-input or team production (p. 779), Jensen and Meckling (1976) emphasised the importance of monitoring all contracts (since the firm is essentially a nexus of contracts) and divided agency costs into specific and identifiable categories including, monitoring costs, bonding costs, and residual losses. Moreover, they demonstrated how agency costs increase as the level of concentrated ownership decreases. In a subsequent paper, Jensen and Meckling (1979) also argue that ownership is a significant variable in the firm's production function and influences the performance of the firm. Fama and Jensen's (1983) analysis of the various forms of business structures (i.e., proprietorships, open corporations, professional partnerships, financial mutuals closed corporations and non-profit organizations) hypothesised that agency costs were reduced in family relationships.

There have been several contributions to the literature which evaluate the impact of ownership concentration and/or control distribution on the performance of the firm. A review of the more significant contributions is briefly considered in the foregoing paragraphs.

In a study of performance in large *Fortune* 500 firms and the effect of the diffuseness between ownership and control on performance, Monsen, Chiu, and Cooley (1968) found that owner-managed firms significantly outperformed professionally managed firms. Similar findings were reported by Radice (1971), who examined a sample of large *Fortune* 500 firms and found that companies in which the same person had ownership and control, outperformed those in which ownership and control were separated.

Hill and Snell (1989) studied 122 *Fortun*e 500 firms and found a positive association between stock concentration and productivity, articulating the importance of a constituency of powerful stockholders on the efficiency of the firm (p. 42). Daily and Dollinger (1992) studied differences between professionally (externally) managed firms and those firms that were family owned and managed. While their results were not statistically significant, they found that family owned and managed firms attain higher levels of performance than professionally managed firms. They also observed that professionally managed firms are larger, older and more aggressive in their strategies.

It is worth noting that the importance of dominance in respect to the performance and success of firms is acknowledged in the literature. Neun and Santerre (1986) for example, find that the existence of dominant shareholders increase the value of the firm. They observed that the profitability of the firm increases as the number of shares held by the dominant shareholders increases. They also provided a scale of ownership concentration, which demonstrates the minimum and maximum levels of ownership required to influence managerial decisions. Moreover, Zeckhauser and Pound (1990) found that the existence of large shareholders increases the value of the firm because of their more effective ability to monitor firm performance. In other words, large shareholders have the propensity to act as monitors and thereby reduce agency costs

Morck, Shleifer, and Vishny (1988) observe similar findings in a study of the relationship between large shareholdings of directors and the market value of the firm. Using 'Tobin's q' as a measure of performance, they found a positive association between the levels of director's ownership beyond 25% and higher Tobin's q.

In a US study of 645 listed companies, Oswald and Jahera (1991) found that management ownership of shares was positively and significantly associated with firm performance. Similar findings were reported by Hudson, Jahera and Lloyd (1992), who studied of 652 companies listed on the NYSE and AMEX.

While many of the above research efforts observe a positive association between performance and ownership/management structure, several contributors to the literature found either no significant association or a negative association between performance and ownership/management structure. Demsetz and Lehn (1985), for example, examined 511 large US corporations using three different measures of ownership concentration and found no significant relationship between ownership concentration and accounting profit rates. Similarly, Galve and Salas (1994) observed no discernable performance differences between family and non-family businesses, but found that family businesses attain a higher productive efficiency than non-family businesses. Gallo and Villaseca (1998) examined 104 Spanish family businesses and found that businesses where the Chief Financial Officer (CFO) was not a family member were larger and had a greater market share, compared to firms that had a family member as the CFO. Moreover, the association between higher Return on Equity Ratios (ROE) and businesses with a non-family member CFO was statistically significant. Interestingly, Gallo and Villaseca (1998) found a statistically significant association between businesses with a family member CFO and Return on Sales (ROS), which they regarded as a less reliable indicator of performance.

In a more recent study of 313 Australian IPOs during the period 1976 – 1993, Balatbat (2001) reports a weak association between ownership and firm performance. Moreover, in a study of the relationship between ownership structure and corporate performance, Demsetz and Villalonga (2001) find no significant relationship between ownership structure and firm performance, and argue that while diffuse structures exacerbate agency problems, these structures also provide compensating benefits that offset such problems. The perspective adopted in this study was that ownership structure is endogenous, that is, ownership structure is essentially determined by individual shareholder preferences and profit maximising interests. Thus when firms decide to go public, they also decide to alter the ownership structure of the firm, "with high probability, of making the structure more diffuse" (p. 210). Demsetz and Villalonga (2001) argue that other studies that treat ownership structure as an endogenous phenomenon, have similarly found that ownership structure fails to explain differences in firm performance. The studies they cite to support their argument include Hermalin and Weisbach (1988), Loderer and Martin (1997), and Cho (1988).

3.3.4 Summary and Conclusion – Part 2

The purpose of this section (3.3) was to provide an overview of the agency theoretic perspective in the current literature, particularly those aspects which provide empirical insights into the numerous performance issues surrounding family business. While the literature is not in agreement, on balance there appears to be an underlying theme that ownership concentration is positively associated with firm performance.

3.4 Part 3: Initial Price Performance Literature

3.4.1 Introduction

There is an extensive body of recent evidence in Australia and abroad covering various aspects of IPO pricing. A large number of studies focus principally on the underpricing phenomenon in the initial period and the various factors that drive the level of underpricing. This study covers the main contributions under several broad headings.

3.4.2 The Underpricing Phenomenon

Numerous studies have shown that initial public offers are underpriced on average when tendered to the public. Indeed, Loughran, Ritter, and Rydqvist (1994) have shown that underpricing is a phenomenon in varying degrees in all 25 countries examined by the authors. More recently, in a study of US IPOs encompassing the period between 1990 to 1998, Loughran and Ritter (2000) found that underpricing attributed to over US$27 billion of potential proceeds being 'left on the table' by IPO firms.

On a basic level, underpricing means that the subscription price of the shares is typically well below market price on the day of listing and accordingly, investors who subscribe to new issues, can potentially earn abnormal returns (also referred to as 'stag profits'). The work of Merret *et al.* (1967) and Reilly and Hatfield (1969) arguably represent the first wave of research, which documented the existence of large systematic profits accruing to investors who subscribe to new issues. An extensive number of subsequent studies (including Australian studies, How, 1990; Lee *et al.* 1994; Steen, 1997) have supported these findings.

Given the large volume of literature, Appendix 2 provides a brief summary of the key findings for each study. It is noted that immediate and long term underpricing is indeed a well-documented phenomenon in several countries. Many of the more significant contributions to the underpricing literature are worthy of mention and are briefly considered under the various headings below.

3.4.3 Factors Contributing to Underpricing Generally

Although there appears to be no consensus on why the underpricing anomaly exists, the evidence generally indicates that the degree of underpricing of new issues is associated with a range of endogenous and exogenous factors including, firm factors, share issue-specific factors and environmental factors. Environmental factors are usually discussed in the context of economic or 'market cycle' influences on initial underpricing, along with the influences of regulatory or institutional frameworks. Share-issue factors relate to influences specific to the issue, for example the issue underwriter and auditor, the amount of issue, the type of issue, the purpose of the issue and so on, whereas, firm-specific factors, include the age of the issuing firm, size of firm, fractional interest retained by founders, the industry category of the firm and so on.

Many of the firm-specific factors are considered in the literature as proxies for uncertainty regarding the value of the firm. It is suggested that uncertainty results from information asymmetries and several models attempt to explain the latter, including McDonald and Fisher (1972), Nueberger and La Chapelle (1983), Chalk and Peavey (1987), Beatty and Ritter (1986), Beatty (1989), and Titman and Trueman (1986).

Some authors have also suggested that IPOs are intentionally underpriced. Carter and Manaster (1990) establish the rationale for intentional underpricing and provide a detailed list of motivating factors for underpricing including some of the following;

- Compliance with regulatory mandates;
- To exploit naïve issuers;
- To provide insurance against potential legal action;
- As a sweetener to encourage return business; and
- To increase the success of the issue.

Reilly (1978) suggests that underwriters intentionally underprice as an insurance against the risk of loss and to increase the chances of success. Numerous findings support this view including Beatty and Ritter (1986), Bartlett (1988), Muscarella and Vetsuypens (1989a), and Baron (1982).

3.4.3.1 Risk Premium - Naïve Hypothesis

A number of contributors to the literature explain underpricing in the context of a risk premium attributable to investors. Since an IPO firm has no performance history, the naïve hypothesis suggests that initial investors are rewarded for their "risky" participation. An extensive body of research has reported an association between the degree of underpricing and ex ante uncertainty, including Rock (1986), Beatty and Ritter (1986), Barry *et al.* (1990), Muscarella and Vetsuypens (1989b), Miller and Reilly (1987), Welch (1989), Levis (1990), Keloharju (1993), Keasey and Short (1992), Barry and Jennings (1993), and Carter and Manaster (1990).

On balance, the evidence indicates that higher risk IPOs are harder to value given the uncertainty associated with initial values. Accordingly, investors must be compensated with higher returns for their risky participation, which results in higher underpricing.

3.4.3.2 Winners Curse

Rock's (1986) model suggests that the existence of information asymmetries in the market for IPOs creates a partitioning of investors into two groups, viz; the informed and the uninformed. Given that informed investors (who are generally considered to be investment bankers) have superior knowledge, they will tend to 'crowd out' the uninformed investors in a good share issue. However, greater uncertainty surrounding a new issue leads to avoidance of the issue by the informed group, assuring uninformed investors an allocation. To ensure that issues are fully subscribed, issuing firms will underprice (discount) the IPO to attract sufficient investors from the uninformed group, mitigating the effects of the "winners curse". Several contributors to the literature examine and provide support for the "winners curse", including Welch (1989), Koh and Walter (1989), Levis (1990), Keloharju (1993), Keasey and Short (1992), Barry and Jennings (1993), and Carter and Manaster (1990).

3.4.3.3 Reputation Effects

Whilst a multitude of studies examine the link between the reputation of certain parties (for instance underwriters, brokers, investigating accountants, experts and auditors) associated with IPOs and the degree of underpricing, the literature principally focuses on particular advisers and their respective roles in improving the credibility of the IPO firm. It is argued that the engagement of reputable advisers can provide significant credibility to financial information and the pricing of the issue, which in turn reduces information asymmetries between the issuer and potential investors. In this regard quality advisers can reduce ex ante uncertainty since the provision of their services will provide more accurate information about the 'true' value of the firm (and a value which is more likely to closely approximate the market value of the firm).

There is a fundamental assumption underlying the reputation-effect hypothesis that warrants some discussion. It is assumed that professional firms in terms of the quality of services offered are not homogenous and can be differentiated. 'Quality' services have been defined by DeAngelo (1981) in the context of technical competence and degree of independence. In respect to accounting and auditing services, several studies have provided evidence that professional accounting firms are differentiated across many dimensions, for example, size, technical competence, and experience (DeAngelo, 1981; Schwartz & Menon, 1985; Francis & Stokes, 1986). There is also evidence that issuers select nationally known firms to sell their offerings at the best possible price (Carpenter & Strawser, 1971).

Briefly, a number of contributors find negative associations between the reputation of the firm's underwriter and the degree of underpricing, viz; McDonald and Fisher (1972), Logue (1973), Johnson and Miller (1988), Neuberger and Hammond (1974), Block and Stanley (1980), Nueberger and Chapelle (1983) and Wolfe, Cooperman, and Ferris (1994). Similar findings have been documented regarding the link between the reputation of the auditor and the degree of underpricing. These include: Titman and Trueman (1986), Krinsky and Rotenberg (1989), Beatty (1989), Menon and Williams (1991) and Holland and Horton (1993). Australian studies have also found support for reputation effect hypotheses, including How, Izan, and Monroe (1995), and Steen (1997).

3.4.3.4 Regulatory and Litigation Issues

A number of contributors have examined the threat of litigation as a possible factor which explains differences in the level underpricing (Tinic, 1988; Steen, 1997). The general theme in the literature is that a harsh regulatory reporting environment will discourage issuers from reporting false or misleading information in offer documents, otherwise issuers and their advisers could be exposed to potential prosecution and severe penalties. In order to avoid contravening the provisions of the law, issuing firms prepare detailed and more accurate information relating to a particular issue. Moreover, underwriters of risky firms will typically price firms below the expected future value of the firm to avoid the threat of litigation (Hughes & Thakor, 1992). Tinic (1988) suggests that pricing an issue below the market value of the firm is akin to buying insurance against future lawsuits, since it reduces the probability of underwriters and issuers being sued in the future ('implicit insurance hypothesis').

A practical means of testing this theory is to examine the level of underpricing in countries in which the law was changed, i.e., ceteres paribus, examine the level of underpricing for IPO firms listing before and after the changes (assuming that changes to the law create a more/less severe compliance regime). For instance, Tinic (1988) found differences in underpricing levels between IPO firms listing before and after the introduction of the Securities Act [1933] in the U.S. This legislation was the first of its kind to introduce due diligence requirements of issuers and their advisers, and included remedies for investors who were misled by issuing firms. Interestingly, Tinic found that underpricing was much higher for firms that listed after the issue of the Federal Securities Act [1933] than those in the pre-issue period. Simon (1989) found similar evidence of higher returns for new issues after the introduction of the Federal Securities Act [1933]. Drake and Vetsuypens (1993) however, challenged the 'implicit insurance hypothesis' by arguing that substantial initial returns were required to support an efficient insurance regime. Moreover, they argued that the Tinic (1988) study was influenced by the choice of sample period and the sample of firms selected. For instance, the post Federal Securities Act period selected was a 'hot-market' period in which prices are normally expected to be higher. Furthermore, smaller firms were selected in the post legislation period relative to the pre legislation period, leading to size-effect bias (higher initial returns for small firms are a well documented phenomenon, see 3.4.3.5 below).

In the context of Australian IPOs, Steen (1997) examined 649 IPO listings between 1984 and 1994 and found that the level of underpricing for firms that listed after the introduction of the Corporations Law in 1991 was lower than those that listed in the period prior to the introduction of the law. His results lend some support to the theory that firms deliberately underprice to avoid possible litigation in the future.

3.4.3.5 Firm and Share Issue Characteristics

The literature examining the links between firm-specific and share issue-specific characteristics, and the degree of IPO underpricing, is extensive with almost all major contributions to the general IPO literature citing the relevance of these factors. While many of these contributions have articulated a diversity of characteristics, only those characteristics considered relevant to this study, particularly in the context of family and non-family companies, are given coverage in the following paragraphs.

3.4.3.5.1 Firm Size

The literature abounds with evidence of 'size effect' influences on shares returns generally (see Schwert, 1983 for a synthesis of the early literature). The predominant finding is that large returns accrue to small firms (Basu, 1977; Banz, 1981; Reinganum, 1981; Roll, 1981, 1982; Blume & Stambaugh, 1983; Brown, Keim, Kleindon, & Marsh, 1983; Keim, 1986; Beedles, Dodd, & Officer, 1988).

A number of plausible explanations for this phenomenon have been articulated, including the popular view that the information set available to investors is limited for smaller firms in contrast to larger firms, which, despite not being listed, may have some recognisable trading history. Limited information for smaller firms would thus result in greater uncertainty and therefore a greater risk profile for these firms. Accordingly, several studies report a negative association between firm size and underpricing, including Banz (1981), who found that based on market capitalisation, smaller firms were more underpriced than larger firms due to differential information effects. An extensive number of similar findings have documented a negative relationship between firm size and the level of underpricing, including Atiase (1980), Grant (1980), Richardson (1984), Barry and Brown (1984), Davis and Yeomans (1976), Chalk and Peavy (1987), Finn and Higham (1988), Young and Zaima (1988), How (1990) and Taylor and Walter (1990).

A multitude of different variables are used in the literature to measure the size of a firm including market based measures such as market capitalisation of ordinary shares after the issue, and financial attributes of the firm, for example total assets. Indeed in several Australian studies, total assets has been used as a measure of firm size, including Taylor and Walter (1991) and Lee *et al.* (1996), and the natural logarithm of total assets; Lee *et al.* (1996) and Steen (1997). Alternatively, Allen and Patrick (1994) used issue size to represent firm size as measured by the natural logarithm of fully paid shares multiplied by the subscription price, whereas Banz (1981), Reinganum (1981), Chalk and Peavey (1987), and How (1990), used market capitalisation as a measure of firm size.

This study uses three continuous variables to represent firm size, namely, consolidated gross assets, consolidated gross revenue and issue size. All three variables were transformed using natural logarithms, due to serious skewness in the data. The first two of these variables, i.e. gross assets and gross revenue, are also consistent with two of the three requirements of Section 45A(2) of the Corporations Law, which provides the legal criteria for differentiating small and large private companies. The third requirement of the Corporations Law relates to the total number of employees, however this data was not sourced in this research project.

3.4.3.5.2 Firm Risk & Ex Ante Uncertainty

Using ex ante uncertainty and overall firm risk as predictors of underpricing is well documented in the literature and accordingly the methodological aspects of the major contributions will be given some coverage here. Arguably, the most common approach in measuring ex ante risk has been to use the standard deviation of returns after listing, either individually or together with other proxies for risk. For instance, Miller and Reilly (1987), Finn and Higham (1988), Johnson and Miller (1988), Beatty (1989), Koh (1992), and Jegadeesh, Weinstein, and Welch (1993) used the standard deviation of daily returns post issue to measure ex ante uncertainty. Many of the studies also used a defined period of observation of daily returns post listing in measuring ex ante uncertainty, including a period of 20 days; Ritter (1986), Affleck-Graves *et al.* (1993), How (1990, 1993), and Steen (1997), 5 days; Ritter (1984b), 2 – 5 days; Miller and Reilly (1987), 1 to 60, 1 to 120 and 1 to 200; Jog and Riding (1987), and the number of days between the offer date and the first annual report; Koh *et al.* (1992).

Alternative measures of ex ante uncertainty include the inverse of gross proceeds from the issue; Beatty and Ritter (1986), Welch, (1991) and Affleck-Graves *et al.* (1993), the reciprocal of offer price; Tinic (1988), Sum (1991) and Jegadeesh *et al.* (1993), the log of gross proceeds; Kim, Krinsky and Lee (1993), a composite of the standard deviation in daily returns 20 days post listing, the period of subscription, and issue size; Woo and Suchard (1993), the ratio of total debt to market value of equity.

An extensive number of studies use more than one variable to measure firm risk, including the following Australian studies; How (1994) - standard deviation of daily returns over a 20 day period, firm age and issue size; Lee *et al.* (1996) - issue size (natural log of equity issue), firm size (natural log of total assets), standard deviation of monthly returns for a twelve month period, operating history (years of prior history), growth options (proportion of the subscription price per share represented by growth options), and retained ownership (proportion of equity retained by previous owners), and Steen (1997) – standard deviation of daily returns, number of users of proceeds, the underwriters handling fee, and the ratio of debt to equity.

This study uses a similar approach adopted by Lee *et al.* (1996) to measure firm risk, albeit with some variations. For example, growth options have not been included given that data was not readily observable in this study, and the standard deviation of daily returns for a 20-day period were observed (consistent with How, 1994 and Steen, 1997) instead of monthly returns for a 12-month period as in Lee *et al.* (1996). Moreover retained ownership has not been included and an additional variable 'gross sales' has been included as a proxy size variable.

Thus the variables which measure firm risk in this study include, the standard deviation of returns for the first 20 trading days after the listing - excluding the day of listing, firm size comprising the natural log of gross assets, the natural log of gross sales, and the natural log of issue size), and the natural logarithm of firm age.

3.4.3.5.3 Firm Age

Several studies have identified a link between firm age and the degree of initial underpricing. The principal theme in these studies is that firm age is a proxy for risk, and thus firms that have a long trading history are more likely to be perceived as less risky than firms with little or no trading history. Typically, firm age is measured as the number of days/years from date of incorporation/establishment to the date of first listing.

Young and Zaima (1988) found that younger firms had higher levels of initial underpricing and greater variability in post-listing returns than older firms. Similar findings were reported by Beatty (1986, 1987, 1989), Muscarella and Vetsuypens (1989a), Carter and Manaster (1990), James and Weir (1990), Affleck-Graves *et al.* (1993), Jegadeesh *et al.* (1993), How and Howe (1994), and Steen (1997).

While there are evidently a variety of techniques documented in the literature for measuring firm age, a common theme appears to be the calculation of the number of days/years since first incorporation. This was the approach adopted Steen (1997), Affleck-Graves *et al.* (1993), Carter and Manaster (1990), and James and Weir (1990), Jegadeesh *et al.* (1993), Lee *et al.* (1994), and How (1990, 1994). Moreover, to correct for skewness in the data, most contributors used logarithmic procedures, and indeed in one article, the fourth root of number of years of financial statements provided in the prospectus was used to measure firm age (How, 1994). This approach was substantiated on the basis of skewness caused by large numbers of start-up firms.

Consistent with the principal themes in the literature, this study utilises the number of days/years from the date of incorporation to measure firm age.

3.4.3.5.4 Issue Size

An extensive number of studies examine the role of issue size in predicting initial underpricing. Typically, issue size is a proxy for firm size which itself is a proxy for firm risk. Hence the greater the issue size, the larger the firm and the lower the level of underpricing, as the market perceives these firms as being less risky in comparison to smaller firms. It is also argued that issue size, as a proxy for firm size, is particularly useful in distinguishing start-up firms or indeed young firms with little trading history and/or minimum resources and established firms with extensive resources and a trading history.

Several contributors have reported a negative association between the level of riskiness of an IPO firm as proxied by the size of an issue, and the degree of underpricing, including, Steen (1997), Lee *et al.* (1996), Holland and Horton (1993), How and Low (1993) Welch (1991) and Carter and Manaster (1990).

3.4.3.5.5 Profit Forecasts

A profit forecast is typically a statement or part of a statement containing information about the future earnings of the firm. In the Australian context, inclusion of a profit forecast in an offer document is not a mandatory requirement and should only be included if it provides relevant information to investors, i.e. "such information as investors and their professional advisors would reasonably require, and reasonably expect to find in the prospectus for the purpose of making an informed assessment…." (Corporation Law, S1022). The general view, however, is that disclosure of information relating to future earnings and dividends prospects albeit voluntary, will signal managements' expectations regarding the future prospects of the firm (Clarkson *et al.*, 1991). The underlying assumption in the literature is that the market perceives voluntary disclosures relating to earnings forecasts as signals of quality and credibility, and accordingly prices such information in an unbiased manner. Thus firms with a profit forecast are expected to have lower ex ante uncertainty and lower underpricing relative to firms without a profit forecast.

Numerous studies have examined various aspects of profit forecasts including Blair and Taylor (1989), who examined the accuracy and reliability of profit forecasts in more than 60 prospectuses between 1976 and 1986. Goodwin (1989) and Lee, Taylor, Yee, and Yee (1993) studied the frequency and accuracy of profit forecasts. Lee *et al.* (1993) found that firms with profit forecasts are on average older, larger, have greater managerial ownership and are more highly levered. In the specific context of underpricing, particularly, the effects of profit forecast information on the level of initial underpricing, Clarkson *et al.* (1991) examined 112 IPO firms that listed on the Toronto Stock Exchange between 1984 and 1987. They report that earnings forecast information is value relevant and that the market perceives this information as a credible signal of firm value. How (1995) examined 266 Australian IPO that listed between 1979 and 1990 and provides evidence that firms with a profit forecast are less underpriced (12.5%) relative to those firms without a profit forecast (16.4%). However, her results were not statistically significant. In contrast, Steen (1997) documents findings in a study of 649 Australian IPOs during 1984-1994, that reflect significant differences at the .01 level.

3.4.3.5.6 Ownership Retention (Fractional Ownership) & Firm Value

Several studies have examined the signalling role of 'quality' attributes of the firm, such as the level of retained equity by the original shareholders. For instance, Leland and Pyle (1977) argue that informational differences between buyers and sellers are pronounced in financial markets and 'moral hazards' prevent the transfer of information between market participants (p.371). For example, sellers may not fully disclose their true characteristics since they may be able to benefit from non-disclosure, and confirmation/validation of these characteristics by buyers may not be possible or too costly. If these hazards prevent the transfer of information, then good quality projects cannot be differentiated and markets may perform poorly, unless the actions of the entrepreneurs can be observed. Leland and Pyle (1977) argue that one such action is the willingness of the persons with inside information to invest in the project/firm. Moreover, since this action is seen as a means of overcoming information asymmetry, and to the extent that the market perceives this action as a credible signal of firm quality, Leland and Pyle (1977) hypothesised that firm value is positively associated with the level of equity retained by the entrepreneurs in the project/firm. Several subsequent studies have supported the signalling hypothesis, including Downes and Heinkel (1992) who examined the signalling role of retained equity ownership and dividend policy on value of the firm, and provided support for the equity retention hypothesis but not the dividend signalling hypothesis. However, in a study of 115 Canadian IPO firms, Krinsky and Rotenberg (1989) argued that insider private information did not increase firm value and accordingly the signalling hypothesis was not supported. In contrast, Clarkson, Dontoh, Richardson and Sefcik (1991) replicated the work of Krinsky and Rotenberg (1989) using a sample of 180 Canadian companies and found a positive and significant association between firm value and the ownership retention signal denoted as ±.

Australian evidence on the association between fractional interest and firm value is well documented by How and Low (1993) who examined 523 Australian seasoned issues of equity made over a 10-year time. The authors used two measures of firm value; the natural logarithm of the firms post-offering market capitalisation (VALUE), and the natural logarithm of the firm's total assets as shown in the prospectus TASSET). They found that both measures of firm value were significantly and positively associated with fractional interest retained by insider. Similar findings were reported by other Australian studies including Lee, Taylor and Walter (1996) and Steen (1997).

A different perspective on the role of insider holdings in the valuation of IPO firms was provided in Ritter (1984) and McBain and Krause (1989). Both studies argued that the positive relationship between insider holdings and firm value could be explained by agency theory (although Ritter [1984] also examined other possible explanations including Leland & Pyle's [1977] signalling theory). As previously discussed, agency theory posits that managerial shirking (and thus agency costs as a consequence) will increase as ownership structures become more diffuse which will ultimately cause investors to seek higher capitalisation rates (McBain & Krause, p.421). In turn this will result in a lower relative valuation of the firm's equity. Moreover, agency theory argues that the price of the offering is endogenous and there is no information asymmetry between issuers and investors, except to the extent that investors are unable to observe the behaviour of managers. In contrast, signalling theory assumes that there are significant informational differences between issuers and investors and signalling via actions by the owners-entrepreneurs (for instance by investing in one's own project) is one means of overcoming these differences. In this sense, the offering price is said to be exogenous. Using the agency theoretic perspective, both Ritter (1984) and McBain and Krause (1989) find a significant and positive association between firm value and the level of insider holdings.

As explained in How and Low (1989), the link between signalling firm value and underpricing was well articulated by Allen and Faulhaber (1989), who argued that the best information about a firms prospects is held by the firm itself (p.304), and good quality firms are able to signal their superior prospects by a low IPO price and quantity. The rationale here is put succinctly by Allen and Faulhaber (1989) in the following quote cited from Ibbotson (1975), that "IPO's are priced … to leave a good taste in investors' mouths' so that future underwritings from the same issuer can be sold at attractive prices" (p.264). Given that *leaving money on the table* is a costly exercise for the issuer, Allen and Faulhaber (1989) argue that this action is seen as a credible signal by investors since only quality firms are able to recoup the cost of this signal from subsequent issues. Indeed Welch (1989) supported this argument by examining 1028 firms that had seasoned issues over a 5-year period. His results show that higher underpriced firms issue shares more than once to compensate for the initial issue. He concludes that only quality firms can afford to underprice.

How and Low (1993) provide Australian evidence of a link between firm value and underpricing using two measures of firm value (as explained above). They find a significant and positive relationship between firm value and underpricing, where firm value is measured as the natural logarithm of total shares issued after the IPO multiplied by market share price at day 20 (after listing). However, when using the natural logarithm of total assets (as disclosed in the prospectus) as a proxy for firm value, they find a positive but insignificant relationship between firm value and underpricing for firms with fractional interest greater than 70%.

Perhaps as a final note on this area of research, the contribution by Sum (1991) is worthy of mention. Consistent with the model formulated by Leland and Pyle (1977), the author argues that only a single–signal model (i.e., the fractional interest and firm value relation) can be supported and that the second-signal model (firm value and underpricing) cannot be supported. This is consistent with the models reported in Rock (1986) and Beatty and Ritter (1986) where a higher level of equity retained by owners-entrepreneurs (ALPHA) "signals a higher firm value and a lower level of *ex ante* uncertainty with less underpricing" (Sum, 1991, p.176). The implication of these findings therefore is that fractional interest and underpricing are negatively related. While this perspective is somewhat anomalous with the literature, it is not entirely unreasonable given that there is an extensive body of literature which supports a negative relationship between quality firm attributes (such as, issue size, and firm size which lower ex ante uncertainty) and underpricing.

However, notwithstanding the findings of Sum (1991), there are two important themes that emerge from the balance of above literature;

High value firms are also firms that have relatively higher levels of insider holdings, and
High value firms are more likely to have higher level of underpricing.

Following these themes, a logical extension is that firms with higher levels of fractional interest must also have higher levels of underpricing. This was supported by Grinblatt and Hwang (1989) and Affleck-Graves *et al* (1993), who found that the degree of underpricing was positively related to insider holdings. Moreover several Australian studies report similar findings including, How (1990), Lee, Taylor and Walter (19960 and Steen (1997).

3.4.3.6 Market Cycles

A number of theories are proposed in the literature which suggests that IPOs are synchronised with economic or market cycles to ensure the chances of a successful subscription. In essence, an issue is more likely to succeed when the market is experiencing a "hot" period than during a "cold" period. The author suggests, a priori, that the old adage "a fool and his money are soon parted" is more likely to apply in a market that is considered "hot" than in a normal market. Indeed, there is evidence of foolhardy buying during US bull markets (Meeks, 1992).

A number of contributions which focus on market cycles and 'fads' have been considered in this study, including Chalk and Peavey (1987), who document increases in the number of IPOs during "hot" periods and decreases during "cold" periods, as well as Allen and Faulhaber (1989) and Marcial (1991), who provide evidence of industry influences in the "hot" market period. Other contributions documenting the relationship between stock market performance and the number of listings are also considered, including, Wise (1988), Cochrane (1989), Ritter (1984a), How (1990), Ritter (1991), and Lee *et al.* (1996).

3.4.3.7 Industry Effects

Following Ritter (1984a), several studies have reported the influence of industry sectors on the level of underpricing. Ritter (1984a) observed a link between an unusually high number of speculative and heavily underpriced issues, particularly with larger numbers of resource-based IPOs (hereafter RBIPOs). He found that RBIPOs were considerably more underpriced than other industries during the 'hot market' periods. This finding is especially relevant in the Australian IPO context, since resources and other associated industries have been (and continue to be) significant contributors to the Australian economy, accounting for approximately 4% of GDP each year (Australian Bureau of Statistics Year Books 1991-1998). Figure 3.1 shows the constant level of contribution of GDP attributable to the mining industry.

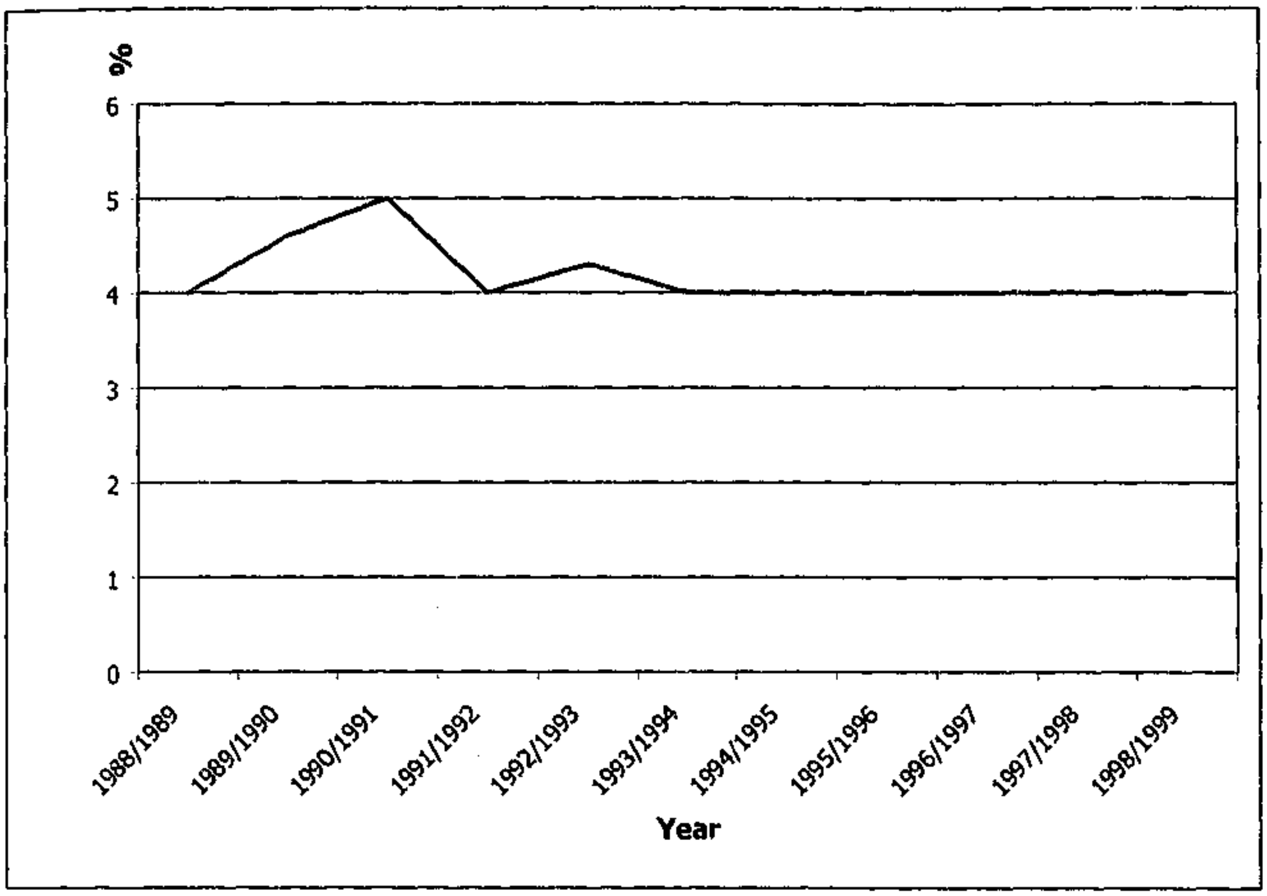


Figure 3.1: Contribution of Mining Industry to GDP (%) 1988 to 1999

Sources: Australian Bureau of Statistics, Australian Mining Industry year 1996-1997 and 1998-1999
Australian Bureau of Statistics, Year Book Australian year 1991-1998

During the period 1988 through to 1999, the annual turnover for the mining industry increased from $19.35 billion in 1988/89 to $37.52 billion in 1998/1999. Moreover, for the same period, industry value added increased from $12.48 billion in 1988/89 to $24.12 billion in 1998/1999, and capital expenditure from $3.7 billion in 1988/89 to $8.04 billion in 1998/1999.

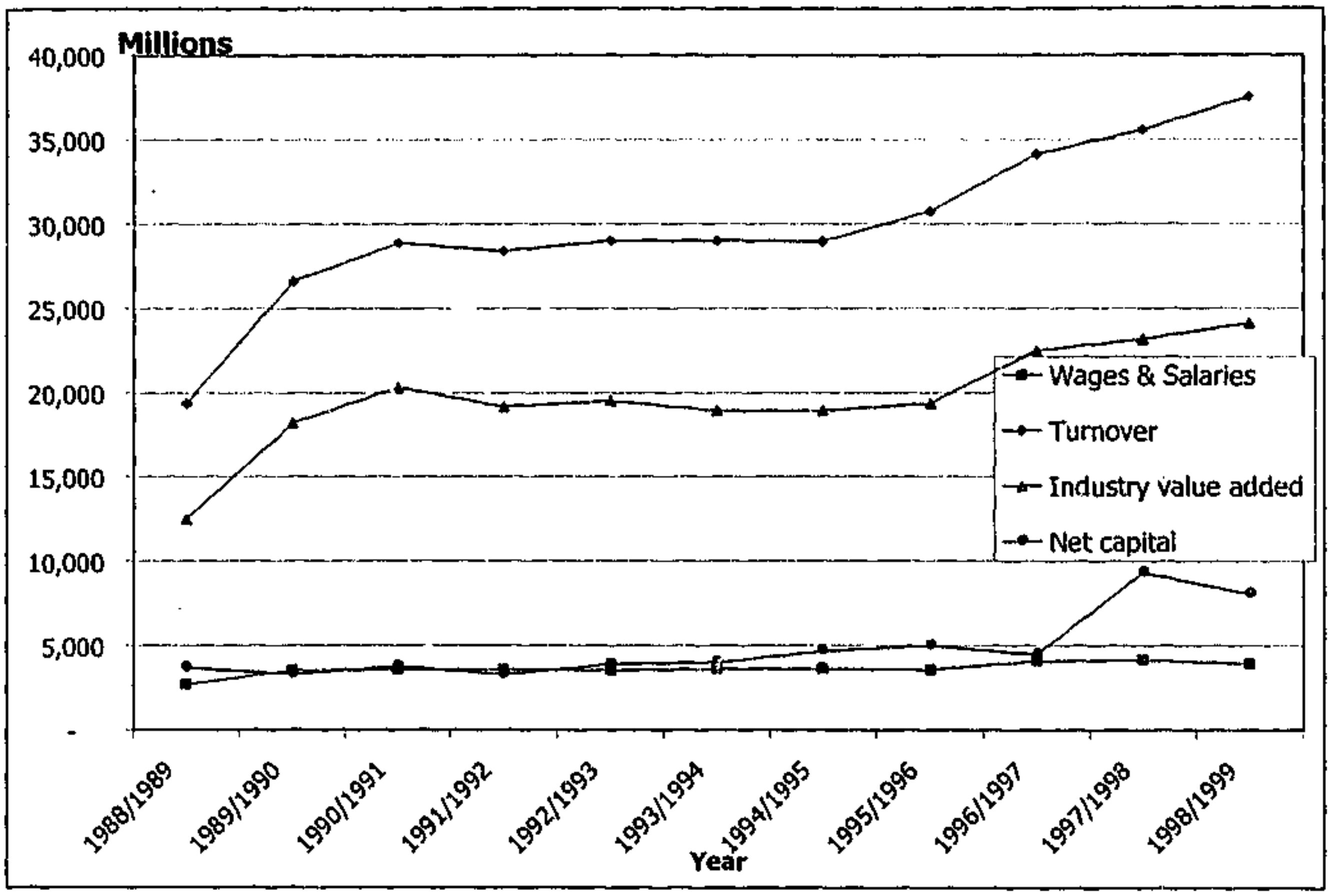


Figure 3.2: Mining Turnover, Wages and Salaries, Industry Value 1988 to 1999

Sources: Australian Bureau of Statistics, Australian Mining Industry year 1996-1997 and 1998-1999
Australian Bureau of Statistics, Year Book Australian year 1991-1998

Moreover, figure 3.3 shows that the number of mining establishments steadily increased over the 1988-1999 period (from 372 to 529). Note the extraordinary increase in establishments in the 1989/1990 period (1313%) immediately following the stock market collapse in 1987.

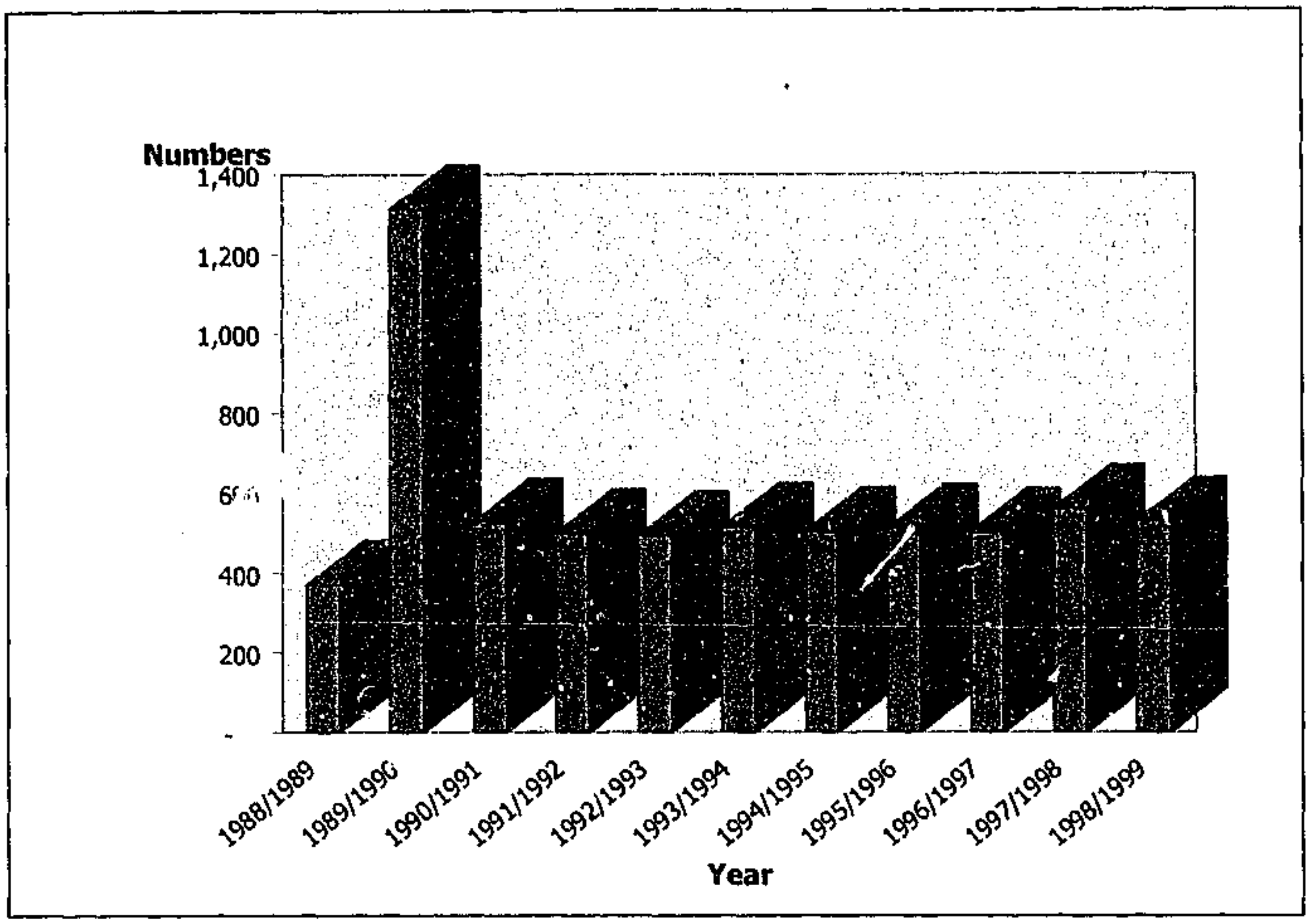


Figure 3.3: Number of Mining Establishments 1988 to 1999

Sources: Australian Bureau of Statistics, Australian Mining Industry year 1996-1997 and 1998-1999
Australian Bureau of Statistics, Year Book Australian year 1991-1998

Figure 3.4 further shows the large number of persons employed in the mining industry, although these numbers have steadily declined over the ten-year period (from 64,677 persons in 1988/89 to 47,300 persons in 1998/99).

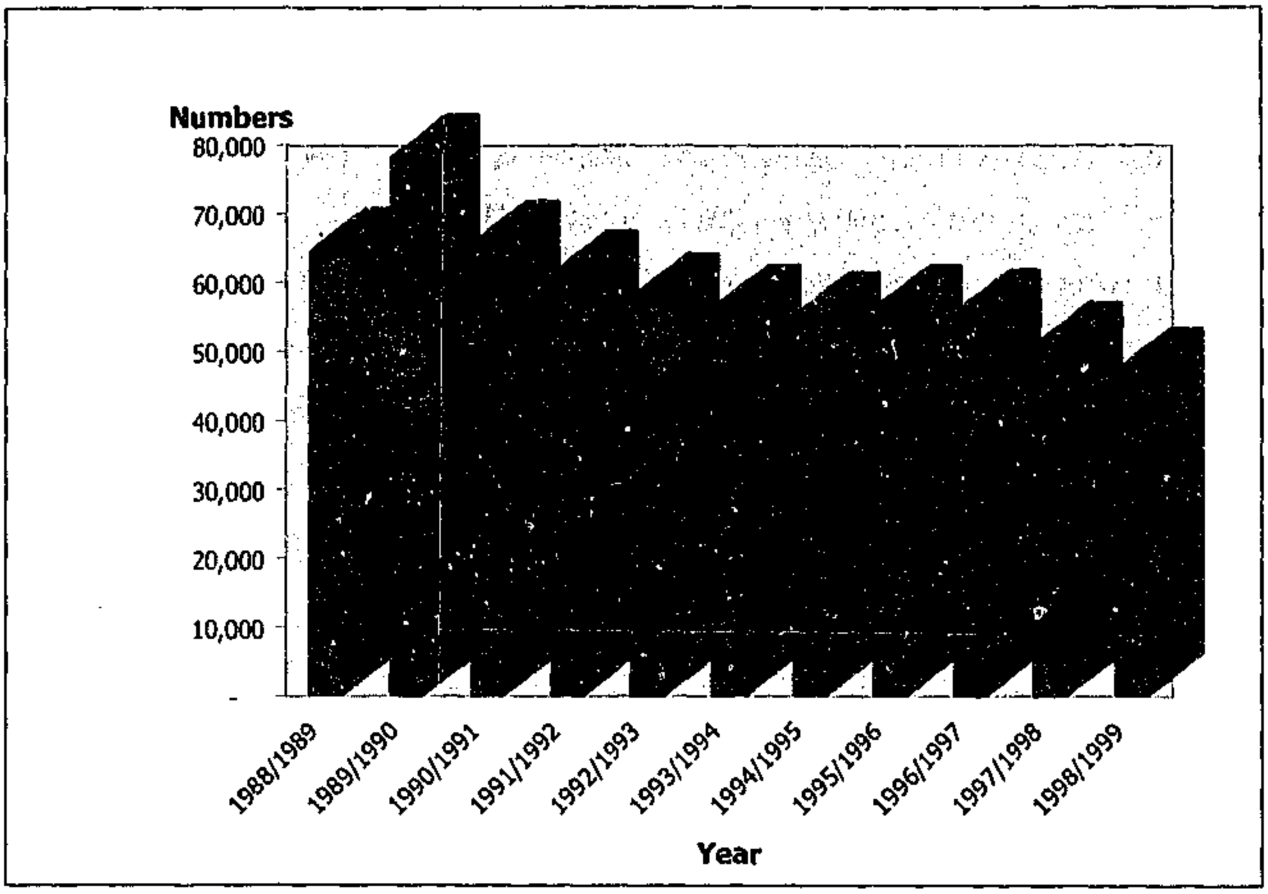


Figure 3.4: Employment in the Mining Industry 1988 to 1999

Sources: Australian Bureau of Statistics, Australian Mining Industry year 1996-1997 and 1998-1999
Australian Bureau of Statistics, Year Book Australian year 1991-1998

While the literature specifically focussing on industry sector influences on the level of underpricing is sparse, a number of studies have reported higher levels of underpricing associated with RBIPOs. For instance, Little (1987) and How *et al.* (1993) report differences in the average level of underpricing of RBIPOs compared to industrial IPO stocks. Using methods which incorporate traditional risk factors (such as firm age, ex ante uncertainty represented by the standard deviation of share returns, firm size etc) and non-traditional measures (such as commodity prices), Woo and Suchard (1993) also report higher levels of underpricing for RBIPOs. They concede, however, that 63% of their sample was represented by small firms, which partly explains their results in addition to industry sector influences.

How (1994) reports a massive level of underpricing of 107% associated with a sample of 130 RBIPOs listed during the period 1979 – 1990. Steen (1996) also reports higher levels of underpricing for mining IPOs (32.47%) compared to industrials IPOs (17.81%) at the 0.05 probability level.

Given the volatility of resource-based stocks and the concomitant effect on underpricing (particularly, Woo & Sutchard, 1993; How, 1994), this study also examines the influence of RBIPOs on the level of underpricing. A dummy variable, MINING is used in this study to denote resources-based industries, and is based on the ASX industry codes for Gold, Energy, Other Metals and Diversified resources. The dummy variable takes the value of "0" for mining companies and "1" for non-mining companies. This approach is consistent with several other studies including How *et al.* (1991) and How (1994), who used a dummy variable for RBIPOs based on the ASX Industry Classification codes 01 to 04 (which includes Gold, Other Metals, Solids and Oil & Gas industries). Interestingly, Woo and Suchard (1993) do not appear to define RBIPOs in an operational context. Allen and Patrick (1994) use a hybrid version of the ASX industry categories to create 5 industry sectors, namely; SECTA, developers/building materials, SECTB, household goods/transport, SECTC, miscellaneous services/industrials, SECTD, finance, and SECTE, resources. Steen (1997) uses a dummy variable based on the ASX industry categories.

3.4.4 Australian Evidence

While Australian evidence on IPOs is not as extensive as that reported in the U.S., nonetheless there have been a number of important contributions to the literature covering both initial and long-term after market IPO performance. One of the first studies to present evidence in the Australian context was the study of IPOs listed during the period July 1976 to June 1988 by Finn and Higham (1988). Their results showed extensive underpricing in the order of 29.2%. They argued that these results were peculiar to Australia due to institutional aspects of the Australian IPO market, viz; barriers to competition between borders. However, Lee *et al.* (1996) challenged these explanations and argued that domestic institutional characteristics "cannot fully explain an anomaly which has proven pervasive throughout the world" (p. 1190). In their study of 266 IPOs that listed between the period January 1976 and December 1989, Lee *et al.* (1996) showed initial (raw average) underpricing of 16.4%.

How (1990) examined Australian IPOs during the period 1979 – 1989 and found that on average, IPO shares were underpriced by 20.87%. Moreover, the results supported a negative relationship between the reputation of the underwriter and the level of underpricing, and a link between particular market cycles and the extent of underpricing (that is, after segregating the sample into distinct periods). How and Low (1993) found a positive association between firm value and the level of fractional ownership, arguing that fractional ownership is used by firms to signal firm value. In another study of 266 IPO firms during the period 1979 – 1990, How (1995) shows that the relationship between forecast disclosure and underpricing is "rather weak".

A number of Australian studies also focus on industry aspects of IPOs, including studies by Woo and Suchard (1993) and How *et al.* (1993). Woo and Suchard (1993) showed returns for resource based IPOs were higher and more volatile than for industrial IPO firms in Australia during the period between 1958 – 1984, whereas How *et al.* (1993) showed lower underpricing for industrial IPO firms in contrast to resource based firms.

A more recent study in Australia by Steen (1997) provides a comprehensive coverage of IPOs and associated issues. Steen (1997) showed that initial underpricing for Australian IPOs during the period 1984 – 1994 was found to be on average 23.53%. Steen's results also establish that mining and technology IPOs are more underpriced than industrial stocks, that market cycles influence the level of underpricing, and that changes to the Australian regulatory environment during the observation period impact on the level of underpricing. Finally, in a more current study of ownership and corporate governance structures of 313 Australian IPOs between 1976 and 1993, Balatbat (2001) documents average underpricing of 15.5%.

3.4.5 Summary and Conclusions – Part 3

On balance, the evidence in the above review supports the existence of an underpricing phenomenon internationally and in Australia. Moreover, a number of endogenous and exogenous variables have been identified, which are associated with the level of underpricing. These variables include the size of the firm (as proxied by total assets, total sales and share issue size), size of the share issue, firm age, timing of the share issue (market cycles), reputation of the auditor, reputation of the underwriter, changes to corporate legislation, level of ownership retention post-issue by founding shareholders, ex ante uncertainty (risk) associated with the issue, and the existence of a profit forecast in the prospectus.

Consistent with the themes articulated in this part of the thesis, the following propositions have been explored and are stated formally in Chapter 4: Australian IPOs are underpriced; the level of initial underpricing for family IPOs will be lower than for non-family IPOs; firm value will be positively associated with ownership retention; ownership retention will positively associated with the level of initial underpricing; firm age will be negatively associated with the level of IPO initial underpricing; underwriter prestige will be negatively associated with the level of IPO initial underpricing; auditor prestige will be negatively associated with the level of IPO initial underpricing; firm size will be negatively associated with the level of IPO initial underpricing; the level of initial underpricing of Australian IPOs will be lower in the periods after the introduction of the Corporations Law 1990 than before the introduction of the law; Australian IPOs will be more underpriced during 'hot' market periods than for 'cold' market periods; firm risk will be positively associated with the level of IPO initial underpricing; and, profit forecast will be negatively associated with the level of IPO initial underpricing.

3.5 Aftermarket Operating Performance Literature

3.5.1 Introduction

A consistent finding in the academic literature is that IPOs generally underperform relative to non-IPO firms over the long-term aftermarket period. Typically, many of the studies focus on stock price performance as measured by cumulative abnormal residuals over a two or three year period, although recently some researchers have used accounting variables for measuring IPO firm performance post listing (Jain & Kini, 1994; Mikkelson, Partch & Shah, 1997; Balatbat, 2001). With the exception of mostly early evidence on long-term IPO performance that found evidence of positive returns to equity in the long-term post listing (Reilly & Hatfield, 1969; Stoll & Curley, 1970; McDonald & Fisher, 1972; Bear & Curley, 1975), more recent studies of IPO share returns support an informational efficient market in the subsequent aftermarket period. The theory of informational efficiency (more commonly 'market efficiency') is fundamental to many IPO studies which examine long-term price performance of IPOs, and accordingly warrants some coverage in this study.

In modern economies, a great deal of economic activity is based on the assumption that market prices represent accurate signals for consumption and investment decisions. The theory of market efficiency has evolved from this assumption and has largely been developed in the finance literature. In an efficient market, there are a large number of players actively competing and each acts on expectations of future market values. This activity will on average result in the full effects of new information to be impounded almost instantaneously in actual prices. The fundamental hypothesis is that share prices fully and accurately reflect all publicly available information. Accordingly, share prices will adjust rapidly to new information and no amount of technical analysis will yield abnormal returns consistently.

Much of the early evidence on the efficient market hypothesis (hereafter EMH) is attributable to the work of Fama (1970), who concluded that "the evidence in support of the efficient market model is extensive, and (somewhat uniquely in Economics) contradictory evidence is sparse" (p. 416). Even after thirty years, Fama's conclusion is surprisingly accurate. Over this time a significant number of academic contributions have attempted to challenge various aspects of the efficient market hypothesis, particularly the Capital Assets Pricing Model (CAPM), a two-parameter risk return model developed by Sharpe (1964) and Lintner (1965), which is fundamental for testing the efficiency of the market in the semi-strong form. These challenges have included issues of efficiency for certain types of firms, for instance small firms in contrast to large firms, and issues of efficiency during certain periods, for example, the efficiency of the market during particular days in the week or months in the year. Studies have shown, for instance, that for small firms the market may be less efficient on Fridays and during the month of January (Keim, 1986).

Other studies have attempted to establish that CAPM is misspecified. If CAPM is used to measure abnormal returns and is misspecified, then it would also fail to appropriately adjust for risk in estimating those returns. Accordingly, abnormal returns may result as "fair compensation for bearing risk that is priced but is not captured by CAPM" (Foster, Olsten, & Shevlin 1984, p. 353). The rationale for this explanation focuses on concerns that 'beta' is the only factor used to describe the risk-return relationship in the CAPM measurement model. What this means is that, beta may not be the only factor that drives returns and that there may be other factors that impact on share price in some systematic way.

Several competing models with a multifactorial perspective have been proposed in the literature and appear to have descriptive qualities (for example, those based on Arbitrage Pricing Theory [APT], as demonstrated by Ross 1976, and Chen, Roll, & Ross, 1986). However, there appears to be some diversity in the literature as to the specific factors that need to be encompassed in alternative measurement models such as APT (see particularly early studies by Ross, 1976). Thus far, the efficient market hypothesis appears to have survived an abundance of questions and continues to play a vital role in modern finance theory.

Whilst a detailed analysis of the EMH literature is considered to be outside the scope of this study, the implications of an efficient market has relevance to IPO share returns in the aftermarket period. In an efficient capital market, prices should adjust rapidly to reflect all new information. In the context of an IPO, all publicly available information relating to the

IPO will be rapidly and instantaneously impounded in the share price, and investors in the secondary market for these shares will not be able to yield abnormal returns consistently. If the evidence in the literature observes consistent abnormal returns accruing to investors in the aftermarket, then we may need to question the efficiency of a market that should fully impound all available information at listing date. The implications are perhaps twofold;

First, evidence that is consistently anomalous with EMH may lead us to reject market efficiency in the aftermarket for IPOs. This means that investors are able to make arbitrage profits by exploiting systematic post-issue movements in share price. Thus, in these circumstances it may be that a buy-and-hold strategy would be more profitable than a quick exit immediately after the shares are listed.

Second, if we do not reject market efficiency, then we may need to provide plausible explanations for abnormal returns accruing to investors in the aftermarket. Except in the case of market 'fads', however, there does not appear to be an abundance of explanations for long-term underperformance of IPOs in the literature. Moreover, those explanations that are advanced in the literature are not conclusively articulated. Finally, in a recent study by Fama (1998), in which he defends the Efficient Market Hypothesis, he argues that abnormal gains in the long-term aftermarket period disappear with "reasonable changes to technique" (p. 283).

3.5.2 International Evidence

Early evidence of share price behaviour of IPO stocks in the aftermarket was provided by numerous studies conducted in the US. Perhaps the first and most cited of these is the Reilly and Hatfield (1969) study, which examined IPOs of common stock during the period 1963-1965 by calculating price changes benchmarked against various market indices over one-month and twelve-month periods. Using this simplistic approach, they observed significant positive returns over the twelve-month period. These results are anomalous with an efficient market, although it is noted that typical of early studies, Reilly and Hatfield (1969) did not adjust returns to accommodate systematic risk. Thus, their results reflected positively skewed distributions (see also the study by Stoll and Curly (1970) who used a similar methodology to measure immediate IPO performance). Interestingly, McDonald and Fisher (1972) reworked a subset of the data in the Reilly & Hatfield (1969) study, and found some support for market efficiency. However, they found that returns in the aftermarket period between the first week and one year following the issue were not significantly different to the average returns of all issues observed.

Ibbotson (1975) examined the excess returns for a sample of 120 US IPOs over a 10-year period between 1960 and 1969. He found positive excess returns in the year after listing, negative excess returns in years two, three, and four post-issue, and positive returns in the fifth year following listing. On balance, however, he concluded that the market is efficient in the aftermarket period. Reilly (1978) found that IPO stocks purchased at the time of offering and held for twelve months post listing generally underperformed, and this was consistent with an overall decline in the market during the period under observation.

Aggarwal and Rivoli (1990) provide evidence that the IPO market is subject to 'fads', which they argue, might explain higher returns in the initial period followed by poorer returns in the subsequent aftermarket period. They examined the long-term aftermarket price behaviour of a sample of 1598 IPO stocks over a twelve-year period between 1977-1988, and found a significant negative return of –13.73% accruing to investors who purchased at the closing price on day 1 after listing, and held until day 250. They suggest that these results can be explained by an overvaluation (or fads) by investors in early aftermarket trading. Aggarwal and Rivoli (1990) define a fad as a "temporary overvaluation caused by over-optimism on the part of investors" (p. 47). They further suggest that it is possible that the aftermarket is not efficient in valuing IPO newly issued shares and abnormal returns that accrue to investors are a consequence of temporary overvaluation by investors in early trading.

Buser and Chan (1987) present evidence anomalous to market efficiency in their study of 1078 IPO during the period 1981 – 1985. They find positive mean-adjusted returns over two periods of 11.2% exclusive of the initial return. However, Ritter (1991) challenges these findings and argues that the benchmark used in the Buser and Chan (1987) study uses the NASDAQ index, which significantly underperformed during the observation period.

Ritter (1991) examined the price behaviour of a sample of 1526 US IPOs of common stock during the period 1975 – 1984. The study found that in the three years after listing, these firms "significantly underperformed using a set of comparable firms matched by size and industry" (p. 3). A number of reasons were advanced by Ritter (1991) which may explain this long-term underperformance, including risk mismeasurement, bad luck, fads, and over-optimism. However, despite making adjustments for these factors, newly listed firms continued to underperform in the long term. Keloharjo (1993) and Ljungqvist (1995) revealed similar findings after adjusting for risk. The research design in Ritter (1991) is based on a matched-pairs analysis which appears to have been imperfectly applied. Ritter's (1991) study also provides evidence of a concentration of underperformance in young growth companies, with smaller firms being the worst performers after listing. Some of these issues have been explored in this study.

Loughran and Ritter (1995) showed that companies issuing unseasoned or seasoned stock during 1970 and 1990, significantly underperformed in comparison with non-issuing firms for a five-year period after the offering. More recent evidence on long-term aftermarket performance in the US is presented by Rajan and Servaes (1997), who showed that IPO firms over a five-year period post-issue significantly underperformed market benchmarks (such as NYSE and AMEX). Carter, Frederick, and Singh (1998) present similar findings over a three year period post-issue based on market indicators (NYSE, AMEX and NASDAQ).

Research in other countries report similar findings. In the UK for example, Levis (1993) used a number of different market indices to measure the returns of 712 UK IPOs during the 1980 – 1988 period. He found underperformance levels over a 36-month period post-issue of between 8% - 23%, depending on the index used. Using a similar approach, Espenlaub, Gregory, and Tonks (1998) showed that long-term returns of UK IPO firms during the 10-year period between 1985 and 1995 underperformed the market. Moreover, Khurshed, Mudambi, and Goergen (1999) provide evidence that UK IPOs underperformed the market by 17.8% during the period 1991 – 1998. Interestingly, they also report that underperformance is largely concentrated among smaller IPO firms, and that profitable private firms underperform in the long-run post-issue. These results are partly consistent with the findings of Ritter (1991).

Long-term underperformance of IPO shares is also well documented in other countries including Hong Kong, as observed by McGuinness (1993a) and Dawson (1987b). Dawson found, however, that market adjusted returns during the first year of trading post-listing do not significantly differ from zero. In Finland, Keloharju (1993) presents evidence of long-term underperformance IPO returns of –22.4% over a three year period post listing.

3.5.3 Australian Evidence

Although the evidence of long-term performance of Australian IPOs is not extensive, nonetheless, there have been a number of significant contributions to the literature which generally support an underperformance phenomenon. Finn and Higham (1988) examined Australian IPOs during the period 1966 – 1978 and observed underperformance over a twelve-month period subsequent to listing, however, their results were not statistically significant. Using a similar methodology employed by Ritter (1991), Mustow (1994) examined 371 IPOs during the 1984 – 1988 period and found that over a 36 month period IPOs underperformed to the extent of –112.8%, and a staggering –163.19% over a sixty month period. Breden and How (1993) similarly observed significant underperformance of Australian IPOs during the ten-year period between 1979 and 1989.

Allen and Patrick (1994) examined the long-term performance of 161 Australian IPOs during the ten-year period between 1974 and 1984, adopting a similar approach to Ritter (1991). They observed significant underperformance (as measured by market adjusted cumulative abnormal residuals) of –25.38% at the 36-month period after issue. After extending the aftermarket period to 60-months, the level of underperformance decreased to –78.4%. They note that the severity of the decline in the results at the 60-month period was attributable the inclusion of post-1987 data.

Lee *et al.* (1996) provide a comprehensive analysis of initial underpricing and post-listing returns for 261 Australian IPOs during the period January 1976 to December 1989. They showed that over a 36-month period, the equally weighted cumulative average returns amounted to a significant –52.25%. In addition, they found that long-term returns were not associated with the level of initial underpricing in a manner consistent with over-optimism or 'fads' explanations in the literature.

3.5.4 Long-Term Operating Performance Literature

A dominant feature of the literature examining the long-term performance of IPOs is the overwhelming focus on stock price performance as measured by adjusted or excess returns (which typify the event study approach used in modern finance literature). Evidence is now emerging, however, that statistical problems are encountered in measuring returns over the longer periods (Brav, 1997; Barber & Lyon, 1997; Kothari & Warner, 1997). Indeed some contributors to the literature have recognised that the long run performance of IPOs is sensitive to the benchmark utilised (Ritter, 1991).

More recently, a number of researchers have demonstrated that when a multi factorial model is used to measure long term returns, there is no evidence of underperformance, and that IPO stocks perform similarly to non-IPO stocks (Eckbo, Marsulis, & Norli, 1998; Brav, Geczy, & Gompers, 1998). Against this background, the researcher is now confronted with the added difficulty of deciding what model is appropriate for measuring the performance of IPOs in the long-term. One approach is to measure performance using accounting variables instead of share prices. Whilst evidence in the literature on alternative measures of IPO performance in the long-term is sparse, the limited number of contributions nonetheless provide valuable insights into alternative measures performance, (e.g., Degeorge & Zeckhauser, 1993; Mikkelson & Shah, 1993; Jain & Kini, 1994; Mikkelson, Partch, & Shah, 1997; Balatbat, 2001).

Using operating income expressed as a percentage of total assets to measure firm performance, Degeorge and Zeckhauser (1993) showed that leveraged buy-outs that make a return to the market underperform in the long-term after the IPO. Moreover, Jain and Kini (1994) used two variables based on financial statement numbers as proxies for cash flow and examined the performance of 682 IPOs (from an initial sample of 2126 firms) that listed between the period 1976 – 1988. Over a six-year period, commencing from the year prior to the IPO until five years after the IPO, they found that the operating performance of IPO firms decreased significantly relative to pre-IPO levels. They also found that firms with a higher level of ownership retention by management relative to other issuing firms, exhibited higher levels of performance.

Similarly, Mikkelson and Shah (1993), found no evidence of improvement in operating returns in the post-listing period despite increases in sales and capital expenditures. They also found a significant relationship between poor performance and the age of the IPO firm, and no relationship between the size of the offer and firm performance. Moreover, Mikkelson *et al.* (1997) found that whilst operating performance (as measured by return on assets) declines for IPO firms on average up to ten years after the IPO, there appears to be no relationship between operating performance and ownership of shares by officers and directors.

The alternative measurement models of long-term performance adopted by Jain & Kini (1994), and Mikkelson *et al.* (1997) have significant appeal for the current study since both models use an agency theoretic perspective in explaining the performance of IPOs in the long term. Similarly, an Australian study by Balatbat (2001) uses financial variables to measure operating performance, and an agency theoretic approach in explaining the link between ownership retention and firm performance. Balatbat (2001) examined the ownership structures and operating performance of 313 Australian IPOs between 1976-1993 and found that the operating returns declined from the year of offering to a period of three years after the offering (although changes in each period were not statistically significant). Balatbat also documents a positive association (albeit weak) between ownership retention and operating performance (as measured by operating revenue adjusted for interest and tax) and between firm history and operating performance. Moreover, firms with low debt and more 'assets-in-place' outperform the average IPO firm (p. 22).

While the literature on IPO performance in the aftermarket period has focused predominantly on price and operating performance (as measured by financial variables), an emerging body of evidence has provided new perspectives in explaining IPO aftermarket performance. For example, over the past 4-5 years, several studies have examined the relationship between specific factors relating to IPO firms prior to listing, and the state of the firm after going public. Jain and Kini (1999) for instance, argue that firms can evolve into three possible states in the aftermarket period; they can survive independently, be acquired and lose their current identity, or fail outright (p1281). They further explain that while the primary aim of an IPO is survival, several factors will influence the post-issue transition of the IPO and will thus determine which of the three states (including survival) the firm will evolve into. These factors include IPO offering characteristics, pre-IPO performance, industry structure, firm strategy, valuation uncertainty, and pre-issue demand. Their results show that pre-IPO performance (as measured by cash flow to total assets) and risk (standard deviation of post-issue returns) are statically significant in explaining the state of the firm in the aftermarket period. Moreover, size was found to be positively related to the IPO firm's ability to survive. They conclude that high-risk firms with poor pre-IPO performance are more likely to fail in the aftermarket period.

Hensler, Rutherford and Springer (1997) also examine the ability of the issuing firm to survive in the aftermarket period. However in contrast to the three post-issue outcomes posited by Jain and Kini (1999), the authors focus on failed firms which are defined as firms that are delisted from a trading exchange due to negative reasons (i.e., reasons other than movement to a new exchange or merger). By tracking the evolution and financial health of IPO firms through the listing period, Hensler et al examine the relation between time-to-failure and IPO characteristics at time offering, including firm size, firm age, initial returns, level of IPO activity, market level, several risk factors (i.e., quantification of the number of risks factors identified in the offer documents), insider ownership and industry performance. Their results show that survival time of issuing firms increases with size, age, initial returns, level of IPO activity in the market, and insider ownership, whereas survival time decreases with risk and higher levels of market activity.

Perhaps two further contributions to the literature worthy of mention at this point include a study by Barth, Beaver and Landsman (1998), and also Krigman, Shaw and Womack (1999). Barth et al (1998) posit that equity valuation can be explained by book value of equity and net income. Using bond ratings as a measure of financial strength, they partition firms into high and low financial strength groups and show that the valuation of firms with lower financial strength is driven by the book value of equity, whereas the valuation of firms with higher financial strength is driven by net income. Their findings indicate that "investors implicitly place more valuation weight on equity book value or net income depending on firm differences relating to financial health" (p32). Krigman et al (1999) document a systematic relation between aftermarket performance (one-year out) and the level of intial underpricing, which they partition into four groups; 'cold', 'cool', 'hot' and 'extra hot' (p1021). By examining the returns and the percentage volume of trade attributable to flipping in each category (flipping defined as "the immediate sale of IPO allocations back to the market of underwriter syndicate", p1016), the authors demonstrate that 'flipping' is a significant predictor of future stock performance. Thus they conclude that moderately underpriced IPOs with low 'flipping' outperform other IPOs.

3.5.5 Summary and Conclusions – Part 4

The purpose of this section was to provide a synthesis of the literature on the long-term price and operating performance of IPOs in Australia and internationally. The literature reveals that IPOs significantly underperform in the long term when both share-returns and accounting variables are used as measurement models. The existence of consistent abnormal share returns might have implications for market efficiency, while operating under performance may be partly explained by agency theory.

Consistent with the themes articulated in this part of the thesis, the following propositions have been explored and are stated formally in Chapter 4: Family IPOs will outperform non-family IPO firms based on operating performance; there is a positive association between the level of retained earnings and operating performance; there is a positive association between the firm age and operating performance; there is a positive association between capital expenditure and operating performance; and, there is a negative association between firm leverage and operating performance.

Chapter 4: Hypotheses of Study

4.1 Introduction and Background

The principal objective of this study is to empirically examine and explain underpricing and operating performance differences between family and non-family controlled firms listed on the Australian Stock Exchange. Thus, this study seeks to address the following three questions:

1. Is initial underpricing higher (lower) for family controlled IPO companies than for non-family controlled IPO companies?

2. Do family controlled IPO companies outperform (under perform) non-family controlled IPO companies in the long-term aftermarket period?

3. To what extent do firm-specific, issue-specific, and exogenous factors influence firm value, the extent of initial underpricing and the operating performance of family controlled IPO companies compared with non-family controlled IPO companies?

Whilst numerous aspects of IPOs are well documented, these questions have clearly not been addressed in the context of family business. The purpose of this chapter therefore, is to propose a number of hypotheses in respect to IPO pricing, IPO long-term performance, and specific variables known to influence IPO pricing and operating performance.

4.2 Initial Underpricing

Given the extensive evidence of IPO initial underpricing in many countries, including the US, UK, Canada, Japan, Singapore, Hong Kong and Korea, we would expect to find, on average, that Australian IPOs are underpriced. The first hypothesis is thus stated as follows;

Hypothesis 1:
Australian IPOs are underpriced

From a review of the foregoing literature, it is evident that ownership and control are significant variables that influence managerial incentives and thus impact on firm performance. Jensen and Meckling (1976) and Fama and Jensen (1983) have established that the dynamics underlying family relationships reduce agency costs and improve efficiency. Moreover, numerous articles have also found an association between concentrated levels of ownership and control, and firm performance (Morck, Schleifer & Vishny, 1988a; Kim & Lyn, 1988; Wruck, 1989; McConnell & Servaes, 1990; Chen, *et al.*, 1991; McConaughy, 1994). Further, there have been many studies within the IPO discipline that demonstrate an association between ownership concentration and equity retention by founding shareholders, and higher firm value in the post offering period, for example Leland and Pyle (1977), Downes and Heinkel (1982), How and Low (1993), and Steen (1997) focus on a 'signalling' perspective whereas Ritter (1984) and McBain and Krause (1989) focus on an agency theoretic explanation. Moreover an extension of these studies as first posited by Alan and Faulhaber (1989), has found a positive association between firm value and the level of underpricing (for instance How & Low 1993, and Steen 1997 provide evidence for Australian IPOs) and a positive association between fractional interest and the level of underpricing (Grinblatt & Hwang, 1989; How, 1990; Affleck-Graves *et al.*, 1993; Lee *et al.*, 1996; and, Steen 1997). Given these findings and that family firms are typically characterized by relatively higher levels of ownership and control, it is expected that the level of initial underpricing of family IPO firms will be higher on average than that experienced by non-family IPO firms. There are two aspects to this expectation which warrant further discussion. Firstly, the positive association between firm value and fractional interest is supported by both agency theory and signaling theory, albeit for different for reasons as explained in Chapter 3 [3.4.3.5.6]. Secondly, the association between firm value and underpricing, is based on signaling theory since higher value firms intentionally underprice to establish market credibility for future seasoned issues at higher prices.

Thus, the second hypothesis is stated as follows;

Hypothesis 2:

The level of initial underpricing is higher for family IPO firms than for non-family IPO firms

4.3 Firm Value, Initial Underpricing and Independent Variables

An extensive number of variables in the IPO literature are known to be associated with the level of initial underpricing, including firm-specific, issue-specific, and other exogenous factors. Given the limited scope of this study, only the following variables will be tested for their association with movements in initial underpricing; firm age, fractional ownership of shares held by founding owners, changes in corporate regulations, reputation of the auditor, reputation of the underwriter, market cycles and profit forecasts. Of particular interest is whether the variables' association with initial underpricing (if any) will be higher or lower for family IPO firms in contrast to non-family IPO firms. Since ownership is an important criterion in establishing the existence of a family business, it will be necessary to test whether ownership retention, an important determinant of control in this study, also provides evidence of underpricing.

4.3.1 Ownership Retention (Fractional Interest), Firm Value and Market Adjusted Underpricing

Following the agency and signalling perspectives adopted for the second hypothesis, shareholders of family firms are more likely to maintain a larger shareholding in the firm post-listing. As demonstrated by Leland and Pyle (1977), Downes and Heinkel (1982), Clarkson *et al.* (1991), How and Low (1993) and Steen (1997), higher levels of equity retention by owners-entrepreneurs send positive signals to the market regarding greater stability and less uncertainty, resulting in higher firm value. Similar findings were documented by Ritter (1984) and McBain and Krause (1989) using an agency theoretic perspective, since firms with higher levels of equity retention by owners-entrepreneurs would be less likely to engage in managerial shirking resulting in lower agency costs and a higher firm value. Given these themes therefore, we would expect to find a positive association between ownership retention and the level f underpricing, and that this association is moderated by family control. The hypotheses for firm value and fractional interest are thus stated as follows:

Hypothesis 3(a):

Firm value is positively associated with fractional interest.

Hypothesis 3(b):

The positive association between firm value and fractional interest is moderated by family control.

The signalling hypothesis explained earlier posits that *high value* firms will intentionally use underpricing to signal superior prospects to investors (Allen & Faulhaber, 1989; How & Low, 1993; and Steen 1997). Following this theme we can expect to find a positive association between firm value and the level of IPO underpricing. Thus hypotheses 3(c) and 3(d) are stated as follows:

Hypothesis 3(c):

Firm value is positively associated with the level of IPO underpricing.

Hypothesis 3(d):

The positive association between firm value and the level of IPO underpricing is moderated by family control.

A logical extension of Hypotheses 3(a) to 3(d) is that there is also a positive association between fractional interest and IPO underpricing, since high value firms which are more likely to engage in intentional underpricing, also have higher levels of insider holdings (see Grinblatt & Hwang, 1989; How, 1980; Affleck-Graves *et al.*, 1993; Lee *et al.*, 1994; Steen, 1997). Thus Hypotheses 3(e) and 3(f) are simply stated as follows:

Hypothesis 3(e):

The level of IPO underpricing is positively associated with fractional interest.

Hypothesis 3(f):

The positive association between the level of IPO underpricing and fractional interest is moderated by family control.

4.3.2 Firm Age and Market Adjusted Underpricing

The negative association between firm age and the level of underpricing has been well documented by Barry and Brown (1984) and Young and Zaima (1988) and by numerous contributors both in Australia and internationally. On the basis of this evidence we would expect to find that younger IPO firms are more underpriced than older firms. This is not unreasonable to expect given that younger firms need time to 'make their mark' and allow the market to assess their performance. There would also be an information asymmetry effect, that is, more information would be available for older firms in the market than for younger firms, resulting in greater uncertainty and variability in returns for younger firms (Rock, 1986). Hypothesis 4(a) is thus stated as follows;

Hypothesis 4(a):
Firm age is negatively associated with the level of IPO underpricing.

Initial underpricing and firm age is also particularly relevant to family business since it is well known that family businesses are among some of the oldest businesses in the world (Jordan, 1997). Consistent with the literature, therefore, we would expect to find not only an inverse relationship between firm age and the level of underpricing as in Hypothesis 4(a), but also that this relationship is moderated by family control. The hypothesis in 4(b) is thus stated as follows:

Hypothesis 4(b):
The negative association between firm age and the level of IPO underpricing is moderated by family control

4.3.3 Underwriter and Auditor Prestige and Market Adjusted Underpricing

The issue of reputation effects relating to underwriters and auditors of IPO firms, has received extensive coverage in the literature (e.g., Logue, 1973; Shapiro, 1991; Wolfe, *et al.*, 1994; How, 1990; Menon & Williams, 1991; Titman & Trueman, 1986; Beatty, 1989). The underlying theme in these studies is that involvement by prestigious underwriters and auditors provides signals of quality to the market, and therefore, results in lower underpricing. On this basis we would expect to find a negative association between prestigious underwriters and the level of underpricing and between prestigious auditors and the level of underpricing.

It is also well documented in the literature that smaller firms are less likely to engage prestigious audit firms and underwriters compared to larger firms (How, 1990; How *et al.*, 1993). We would expect that the inverse relationship between prestigious auditors and underwriters would be moderated by family control. The hypotheses are thus stated as follows:

Hypothesis 5(a):

Underwriter prestige is negatively associated with the level of IPO underpricing

Hypothesis 5(b):

The negative association between underwriter prestige and the level of IPO underpricing is moderated by family control

Hypothesis 6(a):

Auditor prestige is negatively associated with the level of IPO underpricing

Hypothesis 6(b):

The negative association between auditor prestige and the level of IPO initial underpricing is moderated by family control

4.3.4 Firm Size and Market Adjusted Underpricing

Several contributions to the literature demonstrate that firm size is an important variable which influences the level of underpricing. The principal findings are that firm size is a signal of quality and stability, and that more uncertainty and higher risk is associated with smaller IPO firms resulting in higher levels of underpricing (Banz, 1981; Davis & Yeomans, 1976; Chalk & Peavy, 1987; Young & Zaima, 1988; How, 1993; Steen, 1997). Given these findings, it is expected that smaller IPO firms will be more underpriced than larger IPO firms. Following the themes advanced in Hypotheses 5 and 6, the inverse relationship between firm size and the level of underpricing will be moderated by family control. Hypotheses 7 (a) and 7(b) are thus stated as follows:

Hypothesis 7(a):

Firm size is negatively associated with the level of IPO underpricing.

Hypothesis 7(b):

The negative association between firm size and the level of IPO underpricing is moderated by family control

4.3.5 Pre-Post Corporate Law Changes and Market Adjusted Underpricing

Steen (1997) makes an interesting observation in respect to the influence of changes to the IPO regulatory environment in Australia and the level of IPO underpricing. In particular, he demonstrated an association between changes to the Corporations Law and the level of IPO underpricing, and that the level of underpricing was lower in the period after the new laws were introduced. Steen (1997) argued that the new laws were tougher than the former provisions, placing a greater onus on preparers to include more quality and detailed disclosures in the prospectus issued by IPO firms. Given that the observation period in this study covers both the 'before' and 'after' periods relating to the introduction of the Corporations Law 1991, we expect to find similar results to Steen (1997). Hypothesis 8 is thus stated as follows:

Hypothesis 8:
The level of initial underpricing of Australian IPOs is lower in the periods after the introduction of the Corporations Law 1990, than before the introduction of the law.

4.3.6 Market Cycles and Market Adjusted Underpricing

The effect of market cycles in the context of Australian IPOs was demonstrated by How (1990), although there is also an abundance of evidence in this area internationally. The principal theme underlying the 'market cycles' argument is that underpricing is a timing phenomenon and to ensure the success of a new issue, IPOs will synchronise issues to coincide with favourable market conditions. Generally the literature documents a positive relationship between 'hot market' periods and the level of underpricing. Following these findings, we expect to find a positive association between 'hot' market periods within the observation period and the level of underpricing. Hypothesis 9 is thus stated:

Hypothesis 9(a):
Market Cycle is positively associated with the level of initial underpricing.

Hypothesis 9(b):
The positive association between market cycles and the level of initial underpricing is moderated by family control.

4.3.7 Firm Risk and Market Adjusted Underpricing

There is an abundance of finance literature which documents the risk/return phenomenon for highly levered firms. It is also noted, however, that leverage may only represent one dimension of firm risk and indeed there may be several other additional factors that can assist in proving a more accurate profile of firm risk. In this regard, the literature has identified a number of variables that also present as good proxies for risk, including, ex ante uncertainty (as measured by the standard deviation of daily returns post listing), firm age, and firm size (as measured by total assets, total sales, and size of share issue).

On balance, the evidence suggests that there is a positive association between risk and the level of underpricing. Given these findings therefore, we would expect to find similar results in this study. In addition, we would expect that the positive association between firm risk and underpricing will also be moderated by family control.

We are cautious, however, not to over extend this theme because there may be other risk factors acting against the moderating effect of higher levels of fractional interest and firm age for family firms. For example, the literature identifies firm size as a significant determinant of risk, and thus smaller firms have higher risk profiles (Banz, 1981; Davis & Yeomans, 1976; Chalk & Peavy, 1987; Young & Zaima, 1988; How, 1993; Steen, 1997). Accordingly, we would expect some mitigating effect on the association between firm risk and market adjusted underpricing. Hypothesis 11(a) and 11(b) are thus stated as follows:

Hypothesis 10(a):
Firm risk is positively associated with the level of IPO underpricing

Hypothesis 10(b):
Subject to the mitigating effects of firm age and firm size, the positive association between firm risk and the level of IPO initial underpricing is moderated by family control

4.3.8 Profit Forecasts and Market Adjusted Underpricing

The rationale for the inclusion of these reports would be to reduce the level of uncertainty relating to the specific IPO by providing more information to investors. Thus the degree of underpricing should be lower when this information is available in the marketplace.

Hypothesis 11(a):

Profit forecast is negatively associated with the level of IPO underpricing

Hypothesis 11(b)

The negative association between profit forecast and the level of IPO underpricing is moderated by family control

4.4 Long term Aftermarket Performance

In contrast to the extensive share price performance literature, there is only a limited number of studies which focus on the operating performance of IPO firms. Jain and Kini (1994) showed that the operating performance of IPO firms was significantly lower in the long-term period after listing relative to pre-IPO performance levels. More importantly, they showed that where the entrepreneur retained higher ownership IPO firms demonstrated superior performance relative to other issuing firms. Moreover, they argued that a possible explanation for those firms that performed poorly is the potential for increased agency costs that arise when the firm makes the transition from private to public ownership. This is an important point for this study, since an agency theoretic perspective is an underlying theme for explaining firm performance. Further, this study's literature review provides substantial evidence supporting a positive association between concentrated ownership and control, and the level of firm performance. Therefore, given that family controlled firms have a higher level of ownership and control than non-family controlled firms, we can expect to find that family IPO firms outperform non-family IPO firms.

The IPO literature also documents superior operating returns for older and more established firms relative to start-up and younger firms with little, if any, trading history. Lee *et al.* (1994) and Balatbat (2001) provide recent Australian evidence which supports this observation. Thus, it is expected that older and more established family firms will outperform their non-family counterparts.

Following the above themes, hypotheses 12 and 13 are stated as follows:

4.4.1 Operating Performance

Hypothesis 12:

Family IPO firms outperform non-family IPO firms in the long-term.

Hypothesis 13(a):

IPO firms with high equity retention outperform IPO firms with low equity retention in the long-term.

Hypothesis 13(b):

Family IPO firms with high equity retention outperform non-family IPO firms with high equity retention in the long-term.

Hypothesis 14(a):

Established IPO firms outperform young IPO firms in the long-term..

Hypothesis 14(b):

Established family IPO firms outperform established non-family IPO firms in the long-term.

4.4.2 Independent Variables and Operating Performance

Several variables provide signals of quality about the firm, and are known to influence the level of underpricing. These include firm age, the level of fractional interest retained by existing shareholders, the firm's risk profile, and specific prospectus attributes, such as prestigious auditors and underwriters, and the existence of a profit forecast. Given these signals of quality, we would expect to find that quality firms have higher and more stable future cash flows and earnings compared to non-quality firms. We would also expect to find an association between the various signals of quality and firm performance. Jain and Kini (1994), for instance, found a positive association between retained ownership and operating performance. This was supported in a study by Balatbat (2001), who also found an association between operating performance and firm history, leverage and firm size as measured by assets-in-use. Moreover, it would be reasonable to expect that associations between signals of quality (such as firm age, firm risk, and level of retained ownership) would be moderated by firm type. Jain and Kini (1994) also examine growth measures, such as sales and capital expenditure, as potential explanations for changes in operating performance of IPO firms. Thus, increases in operating performance could be attributable, at least in part, to concomitant increases in these growth measures. Given the above discussion, Hypotheses 13 to 16 are stated as follows:

Hypothesis 15(a):

Ownership retention is positively associated with the level of operating performance,

Hypothesis 15(b):

The positive association between ownership retention and the level of operating performance is moderated by firm type (family/non-family)

Hypothesis 16(a):

Firm age is positively associated with the level of operating performance

Hypothesis 16(b):

The positive association between firm age and the level of operating performance is moderated by firm type (family/non-family)

Hypothesis 17(a):

Firm leverage is negatively associated with the level of operating performance

Hypothesis 17(b)

The negative association between firm leverage and the level of operating performance is moderated by firm type (family/non-family)

Hypothesis 18(a)

Capital expenditure is positively associated with the level of operating performance

Hypothesis 18(b):

The positive association between capital expenditure and the level of operating performance is moderated by firm type (family/non-family)

4.5 Summary

Based on a review of the literature encompassing family business, agency theory, initial and long term performance of IPO, this chapter proposes a number of hypotheses to be tested. Results of these tests are presented in Chapter 7 and 8. Finally, Table 4.1 provides a summary of the dependent and independent variables used in regression analysis together with the predicted sign

Table 4.1: Summary of Regression Variables and Predicted Signage

Hypothesis No.	**Predicted Sign**	**Dependent Variables**	Independent Variables
3(a) & (b)	+	Firm Value	**Fractional Interest**
3(c) & (d)	+	Firm Value	**Market Adjusted Underpricing**
3(e) & (f)	+	Market Adjusted Underpricing	**Fractional Interest**
4(a) & (b)	-	Market Adjusted Underpricing	**Firm Age**
5(a) & (b)	-	Market Adjusted Underpricing	**Underwriter Prestige**
6(a) & (b)	-	Market Adjusted Underpricing	**Auditor Prestige**
7(a) & (b)	-	Market Adjusted Underpricing	**Firm Size**
10(a) & (b)	+	Market Adjusted Underpricing	**Firm Risk**
11(a) & (b)	-	Market Adjusted Underpricing	**Profit Forecast**
15(a) & (b)	+	Operating Performance	**Fractional Interest**
16(a) & (b)	+	Operating Performance	**Firm Age**
17(a) & (b)	-	Operating Performance	**Firm Leverage**
18(a) & (b)	+	Operating Performance	**Capital Expenditure**

Chapter 5: Research Design, Methodology and Procedures

5.1 Introduction

This chapter outlines the research design, methodology and procedures employed in the study, and in particular the specific procedures used for testing the propositions. It describes the data used at each stage of the study, outlines the validation procedures used, and examines the dependent and independent variables.

5.2 Research Objectives

There are three principal objectives in this study: To establish a definition of family business; to examine the initial and long term performance of Australian family and non family IPO firms; and, to explore the extent to which exogenous and endogenous variables are associated with firm value and the level of underpricing and operating performance.

To achieve these objectives, it was necessary to design models and utilise techniques and procedures that essentially captured and analysed *existing* data. The major component of this study was primarily *descriptive* in nature because it was principally concerned with observing and explaining existing phenomena. This was particularly the case for examining the initial and long-term operating performance of family and non family IPO firms (i.e., Stages 2, 3 and 4). However, there was also an *exploratory* component within the study, which was necessary to comprehend and define the nature of the research problem(s) from which the hypotheses were then formulated. In Stage 1 for instance, *exploratory* research provided the critical mechanism for delineating family and non-family firms, and thus set the framework for developing hypotheses relating to differences in performance between two or more groups.

To further ensure that the objectives of the study were met, a number of techniques were utilised to maximise accuracy in the observation and analysis of the phenomena, as well as to validate the data. For instance, a *triangulation* approach was adopted whereby a range of qualitative and quantitative techniques were used. Essentially this entailed the use of databases, a questionnaire survey, and a validation process using ASIC data. More specifically, this involved the use of multiple sources of data together with several different techniques in accessing, analysing and validating the data. In summary, the following primary data collection procedures were incorporated in the research design:

- Access and use of several private and public databases;
- Use of 'self-report' questionnaires;
- Confirmation and validation of company information using the ASIC database.

5.3 Research Design and Procedures

5.3.1 Principal Design Features in the Study

The research design of the study incorporates the overall plan or 'blueprint' for collecting, classifying, coding, measuring, and analysing the relevant data. There are several aspects to the design covered in this chapter, including the study setting, duration of the study, types of investigation and extent of researcher interference, types of data and methods of data collection, operationalisation of the variables, measurement models, and analytical procedures. This section however, introduces the primary components of the investigation, which are then operationalised and explained in further detail within each of the individual stages of the study.

The research design for Stage 1 (Definition of a family business) was *exploratory* in nature because investigation in the area encompassing family firms and IPO's is relatively new, and thus many of the research problems and concepts were not fully known. Moreover, the research propositions for the study could not be crystallised until many of the issues relating to the definitional aspects of family firms were more thoroughly explored. Thus an extensive review of the family business literature was a principal feature of the research design in Stage 1. The outcome of the review was critical in determining whether common themes among the extensive number of definitions could be drawn together, and indeed, to determine whether these themes could be supported by authoritative principles embodied in legal and accounting practices. Finally, an exploratory design was required to determine whether it was feasible and practical to delineate family firms from non-family firms once a definition of family business was proposed. In this sense, the design involved exploring the different types of information available on the ASIC database and validating the definition of family business by using a questionnaire.

Stages 2 and 3 of the study (i.e., identifying IPOs within the observation period, and calculating IPO underpricing), involved collecting secondary data for both descriptive and explanatory purposes. For instance, existing data relating to both family and non-family firms were sourced and recorded (measured) only once, i.e., either at the time of the prospectus issue (e.g., specific firm and prospectus information) or at the time of listing (e.g., share price data). This procedure is typical of a *cross-sectional* research design. Moreover, once the data were collected, measured, and analysed, comparisons of measures of interest (e.g., level of initial underpricing) were conducted between groups (e.g., family and non-family firms). This extended procedure required a simple *cross-sectional between-groups* research design.

The data were also used to test for associations between the level of initial underpricing and factors known to be associated with changes in the level of underpricing (e.g., firm size, firm risk, leverage, issue size). Furthermore, tests were conducted to determine whether this association was different between groups (i.e., family and non-family firms, and family and non-family within mining and non-mining groups). These tests are typical of *correlational* studies where important variables that have explanatory power are identified and the significance of those variables and strength of explanatory power is explained by statistical models.

Although the researcher had discretion to nominate the factors known to be associated with underpricing (independent variables), and indeed the level of those factors in some cases (for instance, selecting only firms with fractional ownership greater than a predetermined level), this research was primarily non-experimental. This is because the research was not conducted in a controlled environment, where events were manipulated and reactions to these events assessed accordingly. In essence therefore stages two and three of this study were founded on non-experimental research designs.

Significance testing of research outcomes was conducted using numerous parametric and non-parametric procedures. For example, *t*-Tests and *Mann-Whitney U* Tests were used to assess mean difference between two groups (e.g., family and non-family firms) on the level of underpricing, whereas Factorial Analysis of Variance (ANOVA) testing was used to assess mean differences among fixed groups (e.g. family and non-family IPOs within the mining and non-mining industries) and covariates (e.g., retained ownership, size, age, etc). In addition, *Chi square* tests were taken to test the independence of categorical variables.

A common problem encountered in *non-experimental* research is the inherent threat to internal validity caused by *between-subject* designs. For instance, Schwab (1999) identifies two potential hazards applicable to *between-subject* designs which may have relevance to this study: Variable *selection* and *nuisance* variables. Significant or non-significant differences between groups may be attributable for example, to important variables that have been omitted or variables that are not currently the subject of observation and are known to be associated with the dependent variable (*nuisance* or *confounding* variables). In this study, every effort was made to use only those variables and methods supported by the literature. Moreover, trained and supervised personnel were employed to assist in the collection and recording of data, and the final data, together with statistical procedures and test results were verified and validated by two independent persons. Thus, threats to internal validity would appear not to pose any serious concerns in this study.

Stage 4 of the study is involved in examining the operating performance of IPO firms over time relative to the year prior to listing. This is a panel (*longitudinal)* design since the dependent variables and independent variables are measured more than once over a four-year period. While comparisons were made *between-subjects*, e.g., the performance of family compared to non-family firms over a four-year period relative to Year_{-1}, comparisons were also made over the same period *within-subjects* (i.e., the performance of family firms over a four-year period). Thus the research design for Stage 4 is a simple *within-subjects* panel design. Stage 4 also tests for associations between factors known to influence the level of operating performance (for example the level of debt, firm age, fractional interest and capital expenditure) and various measures of operating performance (dependent variables). Design features and statistical testing for these procedures is similar to those adopted in Stages 2 and 3 and will thus not be given further coverage here.

Within-subject panel studies are also susceptible to problems associated with internal validity. In this regard the potential threats due to *instrumentation*, *systematic trends*, and *mortality* were of relevance in this study. *Instrumentation* refers to changes in the measurement instrument or the manner in which the instrument is administered (e.g., by different individuals) at each point of measurement, whereas the problem of *systematic trends* refers to historical patterns or trends that may occur in the environment which causes variations in the results (for instance, all share prices are likely to be high during 'hot' market periods, and thus levels of underpricing during these periods are also likely to be high). The problem of mortality relates to attrition and occurs when some of the cases terminate during the measurement period.

As indicated above, the data were collected and recorded by the author together with trained and supervised personnel. Moreover, all of the testing of the variables was undertaken by the author using standardised procedures (and pre-printed forms) which were supervised and cross validated by an independent party from the Australian Securities & Investment Commission, and all tests were applied consistently for each period over the four-year period. Most importantly however, all of the data used in the project was *secondary* in nature and collected from reports and documents prepared in accordance with regulatory pronouncements (for example mandatory accounting standards, stock exchange listing rules and official quotations, and the provisions of the Corporation Law). Moreover these pronouncements impose considerable obligations on directors to ensure accuracy, consistency and reliability of the information disclosed in reports and relevant documents prepared for public consumption (for example annual financial statements which are audited). Thus most variables in this study were also assumed to be accurate, consistent and reliably measured due to the strict reporting compliance regimes described above. Accordingly, *instrumentation* has not posed any serious threat to internal validity of the results.

The problem of *systematic* influences was also carefully considered when the sample period for selection of IPO firms was chosen. For example, the 12-year period selected for observation was relatively stable in economic terms and while there were many periods of high market activity, there were also a corresponding number of periods with low market activity. In any case, given that all qualifying IPOs during the 12-year period were included for observations (i.e., both family and non-family firms), it would be reasonable to suggest that systematic influences would affect all firms equally and thus differences between groups could not be attributable to these influences. Finally, the problem of attrition was factored into the research design by selection of a long observation period, i.e., a 12-year period which yielded a final total of 604 IPO firms. Therefore any attrition was treated as a missing observation, which reduced the sample size particularly when conducting analyses for aftermarket performance.

5.3.2 Stage 1: Definition of Family Business

One of the primary objectives of the study was to establish a definition of family business which could be utilised for the purposes of delineating family and non-family business IPOs. The research design for this stage encompassed mechanisms which identified, analysed and validated the key characteristics of family business. This initially entailed a detailed review of the family business literature, followed by an analysis and consolidation of a number of common themes, namely, control, ownership and dominance. Moreover, to further understand the relationships and importance among these themes in a family business context, it was also necessary to examine the literature on agency theory.

Design considerations were predicated on the importance of providing a definition of family business that had authoritative foundations. In this sense, a regulatory perspective was adopted and a number of Australian and International Accounting Standards were reviewed for potential validation and support of the common themes relating to the definition of a family business. For example, Australian Accounting Standard AASB1024 – Consolidated Financial Reports was examined for issues (i.e., definitions and disclosure requirements) relating to control, ownership and dominance. Similarly, Australian Accounting Standard AASB1017 – Related Party Disclosures, and International Accounting Standard IAS24-Related Party Disclosures, were examined for issues relating to directors and director related entities (e.g., determining whether directors exercised control or significant influence in conjunction with related parties).

Additional authoritative support was sought from relevant sections of the Corporations Act (2001) (i.e., statutory legislation which regulates corporations in Australia), particularly definitions and financial statement disclosure requirements that could provide some indication of the control structure of an entity. These included the definitions of related persons, associated persons, directors, and substantial shareholders, together with a review of the specific disclosure requirements relating to names of directors, board members and related interests in the entity.

The definition of family business adopted in this study is divided into a *primary definition* and a *secondary definition*. Provision of a definition assisted in the determination of whether it was possible to access and link information related to ownership, control, continuity of control, and dominance in decision-making.

5.3.2.1 Primary Definition

A family business is an entity controlled by a private individual, directly or indirectly, in conjunction with close family members.

5.3.2.1.1 Indicators of control

The following factors would normally indicate the existence of control;

- the holding of a majority ownership interest and associated voting rights by a private individual either singularly or in conjunction with close family members, and

(Authority, AASB1024 Consolidated Financial Reports, para 7[xxvii])

- in conjunction with close family members, the capacity to;
  - dominate the composition of the board of directors or governing body of another entity;
  - appoint or remove all or a majority of the directors or governing members of another entity;
  - control the casting of the majority of the votes cast at a meeting of the board of directors or governing board of another entity;
  - cast, or regulate the casting of the majority of the votes that are likely to be cast at a general meeting of another entity, irrespective of whether the capacity is held through shares or options; and the existence of a statute, agreement, or trust deed, or any other scheme, arrangement or device, which in substance, gives an entity the capacity to enjoy the majority of the benefits and be exposed to the majority of the risks of that entity, notwithstanding that control may appear to be vested in another entity.

(Authority, AASB1024 Consolidated Financial Reports, para; 7[xvi (a) to (e)])

5.3.2.2 Secondary Definitions

The primary definition must be interpreted in the context of the following definitions;

5.3.2.2.1 Control

Means the capacity of an entity to dominate decision-making, directly or indirectly, in relation to the financial and operating policies of another entity so as to enable that other entity to operate with it in pursuing the objective of the controlling entity;

(Authority, AASB1024 Consolidated Accounts, para 9)

Additionally, the controlling interest must exhibit continuity characteristics

5.3.2.2.2 Capacity

Means ability or power, whether direct or indirect, and includes ability or power that is presently exercisable as a result of, by means of, in breach of, or by revocation of, any of or combination of the following;

- Trusts
- Relevant agreements; and practices whether or not enforceable.

(Authority, AASB1024 Consolidated Financial Reports, para 9)

5.3.2.2.3 Entity

Means any legal, administrative, or fiduciary arrangement, organisational structure or other party (including a person) having the capacity to deploy scarce resources in order to achieve objectives.

5.3.2.2.4 Close family members

Means "close family members of the family of an individual, (are those) that may be expected to influence or be influenced by, that person in their dealings with the enterprise (entity)".

(Authority, IAS24 Related Party Disclosures, para 3(.85))

Close family members are included within the definition of 'director-related entities', itself a defined term in AASB1017 Related Part Disclosures.

5.3.2.2.5 Director-related entities

Means in relation to particular directors, the spouses of such directors, relatives of such directors or spouses, and any other entity under the joint or several control or significant influence of such directors, spouses or relatives.

(Authority, AASB1017 Related Party Disclosures, para 9.1)

The term "relative" is a defined term in the Corporations Law.

5.3.2.2.6 Relative

In relation to a person means, the spouse, parent or remoter lineal ancestor, son, daughter or remoter issue, or brother or sister of the person

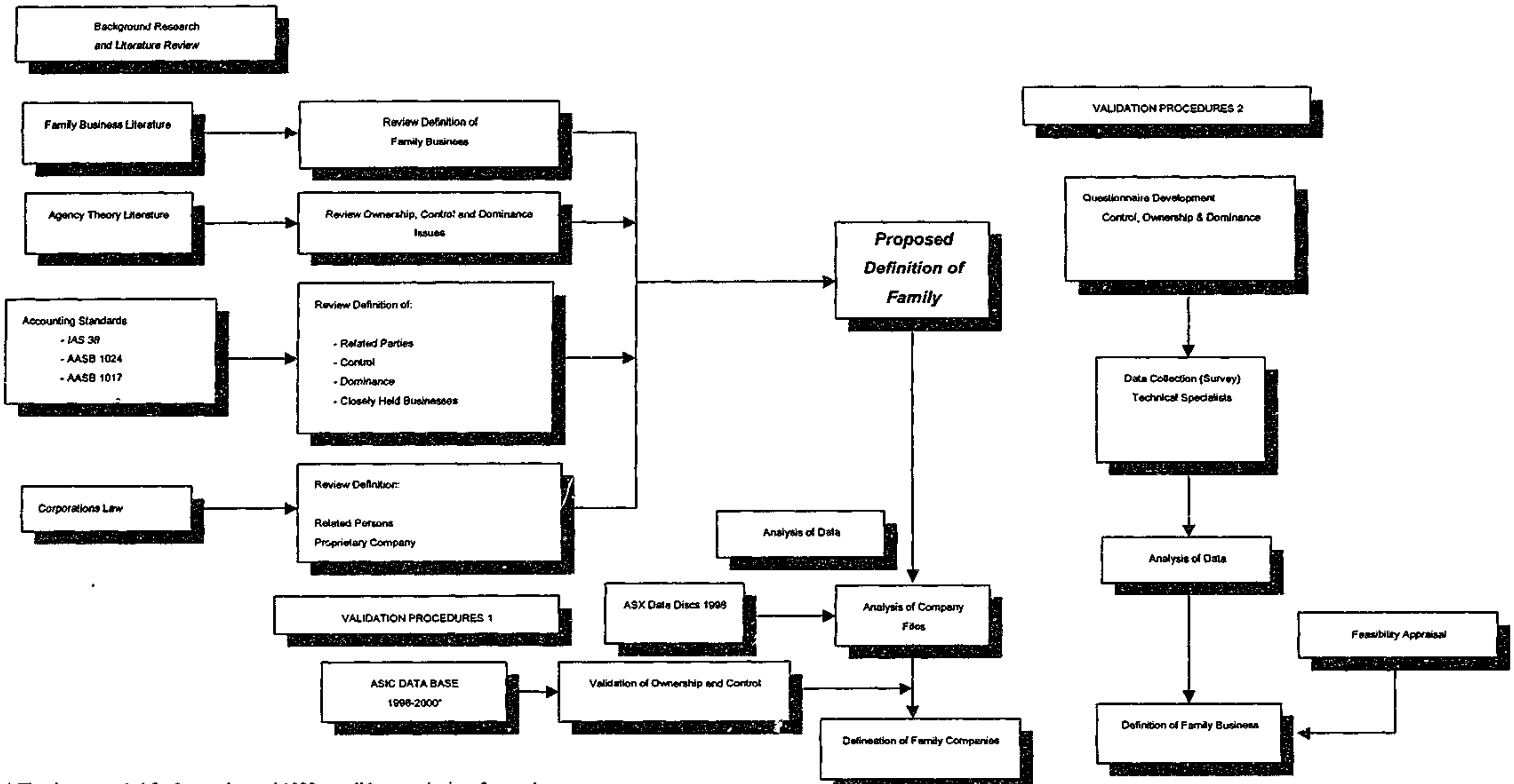
(Authority, Corporations Act S5.1)

5.3.2.3 Feasibility Study

Following determination of the definition for family business, a feasibility study was undertaken to determine whether it was possible to conduct extensive ownership traces of shares held by directors and their related parties, beneficially and non-beneficially. Of particular interest here was the search for ownership of shares by entities other than natural persons, for example, public or private companies or trusts via trustee companies. Often, an extensive ownership search would typically involve a major shareholder who had further interests in the company via several related entities, including proprietary companies holding shares in their own right and/or as nominee companies holding shares as trustees of family trusts.

The starting point for the research was an examination of financial statements and other corporate details of the population of companies registered with the ASX (N = 2,022) for the period ending 30 June 1998. A total of 2,022 names of listed companies were electronically downloaded from the ASX 'datadiscs', a library resource (CD Rom) within Monash University and updated annually by the ASX. The names of each company were recorded into Excel spreadsheets and categorised into active and delisted companies. In addition, the specific criteria identified such as ownership concentration, number of shareholders, paid-up capital, etc, were also recorded in the spreadsheet.

Where company information or specific information relating to a company was not available on the ASX Data Discs, the Annual Report files of Australian Corporate Advisor Pty Ltd and/or the Company Financial Statements files of Bloomberg.L.P, were used to complement the initial data source. Annual financial statement files of the Australian Securities and Investments Commission (ASIC) were also used to validate the initial data source, to examine related party disclosures, to examine continuity of control for a period of two years after the year ending 30 June 1998, and to validate the ASX data generally. Figure 5.1 outlines the procedures used in the feasibility study.



* The time extended for 2 years beyond 1998 to validate continuity of control.

Figure 5.1: Definition of Family Business – Background Research & Feasibility Study

Since the definition of family business proposed in the study was based on control by an individual (in conjunction will close family members) and continued control, relevant files of listed companies were examined. The following factors were noted for each company;

- Evidence of existing control,
- History of control,
- Continuity of control (ASIC database), and;
- Related party relationships

Moreover, 10 specific criteria (see Table 5.1) were examined and used to differentiate family controlled firms from non-family controlled firms.

Table 5.1: Criteria for Determining Firm Attributes

Company Characteristic	Measure
Top 20 shareholders	Concentration of share ownership (quantitative measure) (ASIC Form 316)
Number of shareholders	Ratio of shareholders to concentration of top 20 shareholders (quantitative measure)
Paid Up Capital	Ratio of paid up capital to concentration of share ownership by 10 shareholders (quantitative measure) (ASIC Form 316 & Balance Sheet)
Shareholder Spread	Spread of shares (minimum no. of shares = 500)
Chairperson	Determine the number and name of the chairpersons of the board of directors over time including evidence of dominance (quantitative and qualitative measures)
Board of Directors	Determine the number and names of the directors (quantitative and qualitative measures) over time
Management Team	Determine the number and names of key management personnel (quantitative and qualitative measures) over time
Substantial Shareholdings	Determine the names and shareholdings of substantial shareholders (ASIC)
Related Parties	Determine the names of related parties and links between substantial shareholders (particularly board membership of the firm itself or upstream & downstream firms, participation in board meetings, and share ownership within firm or upstream & downstream firms) (Notes to the Financial Reports)
Control Continuity	Examine the annual financial statements of each company for a period of two years post listing and determine continuity of control by key directors/shareholders based on position held within firm or related firms, board membership of firm or related firms, share ownership within the firm or related firms and meetings attended within the firm.

5.3.2.4 First Validation Procedure

The initial differentiation analyses revealed that, out of the 1,214 active companies on the ASX at 30 June 1998, **197 (16.23%) were family controlled and 1,017 (83.77%) were non-family controlled.** However, details of companies not falling directly within the dichotomous groups required a further comprehensive analysis for evidence of ownership, control and dominance. This was undertaken for approximately 60 companies using detailed ASIC data including relevant statutory lodgements (e.g., Form 316, which requires companies to annually disclose ownership interests).

This process provided a validation of the procedures required to delineate family and non-family controlled businesses, and confirmed that information relating to company ownership, control and dominance was in fact accessible. That is, if not initially during the first level of searching (via a variety of databases including ASX data discs, the Annual Report files of Australian Corporate Advisor Pty Ltd and/or the Company Financial Statements files of Bloomberg.L.P), then almost always after second, third, and in some instance up to the tenth level of searches using the ASIC database. This extensive process also identified inconsistencies in the data source, particularly missing data, conflicting ('grey area') data between data sources, and in some cases non-existent data in respect to some companies. Notwithstanding, the ability to access several databases remedied many of these problems and in many cases cross-validated specific items of data. Indeed access to the comprehensive ASIC database proved very useful in this regard. Finally, the validation procedure allowed links to be established between directors, their related interests and their director-related entities.

Figure 5.2 illustrates a typical example of searches involving some of the companies that were listed on the ASX at 30 June 1998.

First Level Search

ABC Ltd (Listed Entity) – Ownership Search;

- John Citizen	15% Holding
- Mary Citizen	10% Holding
- Citizen Pty Ltd	10% Holding
- J Nominees Pty Ltd	15% Holding
- XYZ Fund Managers	15% Holding
- Diverse Holdings	35% Balance

Second Level Search

Citizen Pty Ltd – Ownership Search

- John Citizen	40% Holding
- Mary Citizen	20% Holding
- LMY Pty Ltd	40% Holding

J Nominees Pty Ltd - Ownership Search
(Trustee of Citizen Family Trust)

- John Citizen	50% Holding
- Mary Citizen	50% Holding

Third Level Search

LMY Pty Ltd – Ownership Search

- John Citizen	20% Holding
- Mary Citizen	20% Holding
- XYZ Pty Ltd	60% Holding

Fourth Level Search

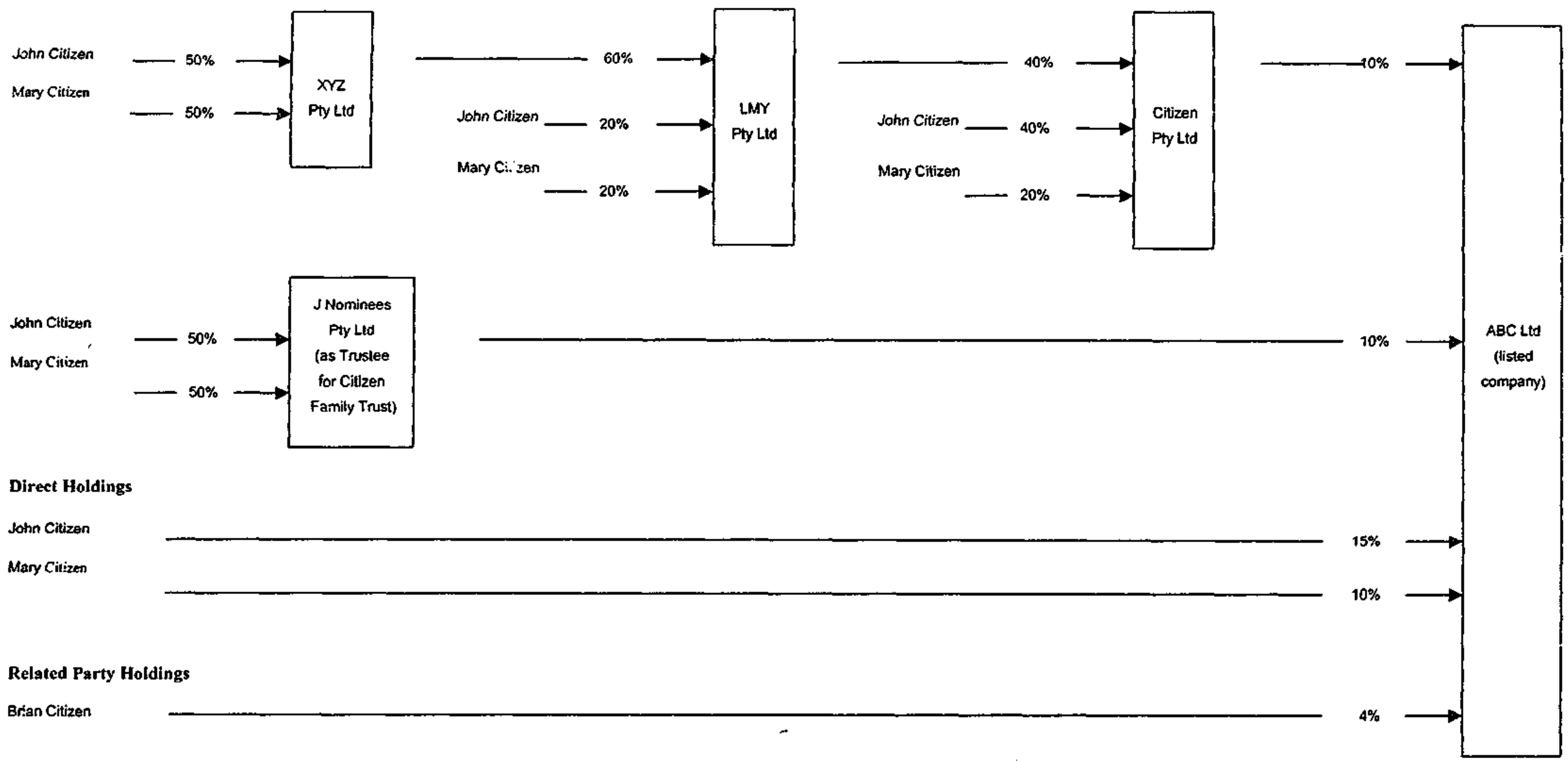
XYZ Pty Ltd – Ownership Search

- John Citizen	50% Holding
- Mary Citizen	50% Holding

Figure 5.2: Examples of Various Levels of Ownership Searches – ABC Ltd

The example in Figure 5.2 (which uses fictitious names), illustrates the extent to which some companies required downstream ownership searches to determine whether or not they qualified as family businesses. As previously discussed, in some cases, 9th and even 10th level searches were required. This was made possible by having access to the ASIC database which allowed searches of not only public company holdings but more importantly, private company holdings.

The example provides sufficient evidence of ownership and control which suggests that ABC Ltd is a family business. For instance, both John and Mary Citizen (who are assumed to be related) jointly held 25% of the voting shares in ABC Ltd directly. They also held at least 25% of the shares in ABC Ltd indirectly through the joint ownership of interposed entities; Citizen Pty Ltd and J Nominees Pty Ltd (a trustee company acting on behalf of the Citizen Family Trust). Figure 5.3 further illustrates the direct and indirect holdings of both John and Mary Citizen and related parties.



Notes:

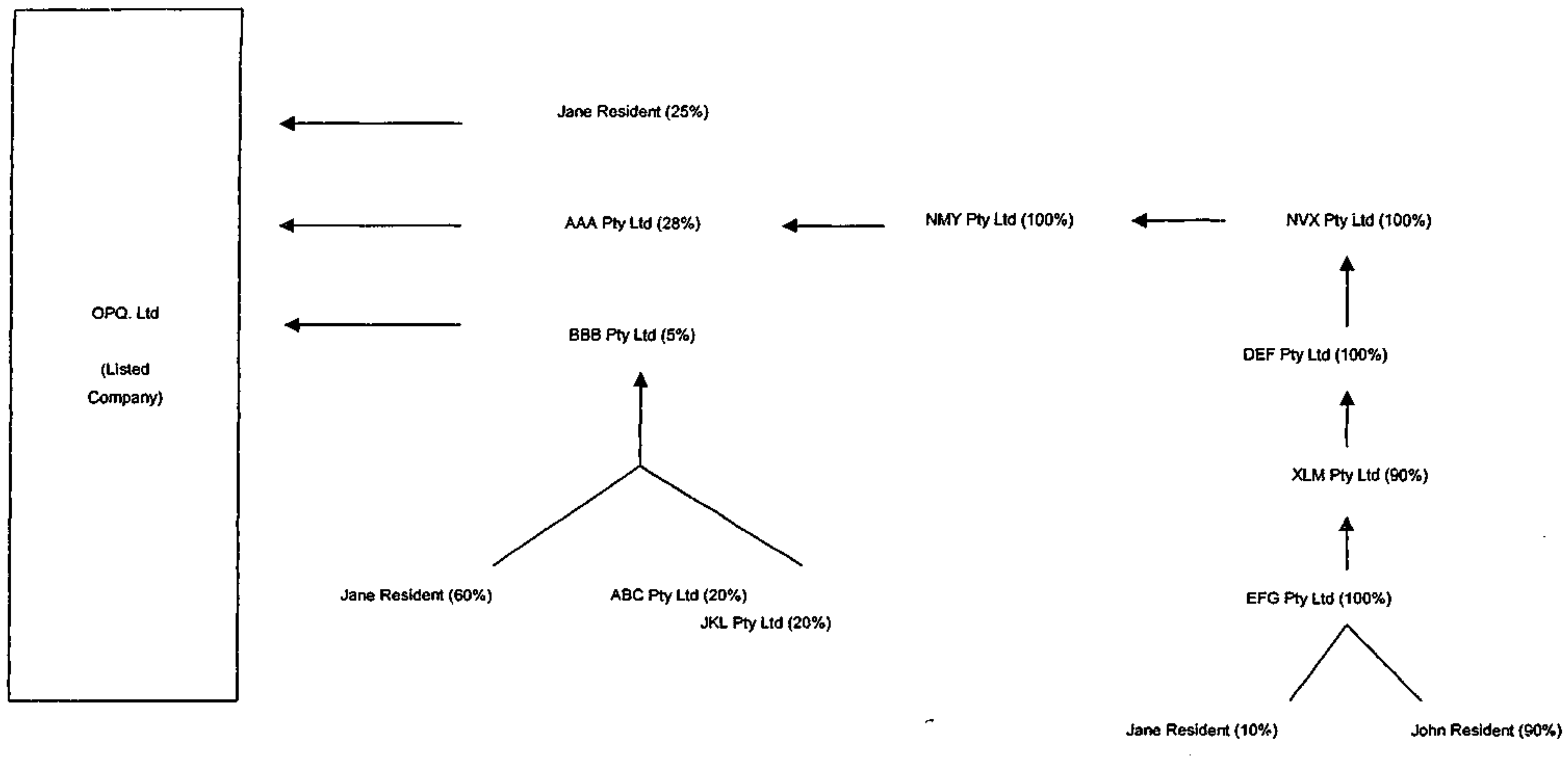
1. Citizen Pty Ltd is effectively controlled by John and Mary Citizen, who own 40% of the company directly and the balance indirectly via equal ownership of XYZ Pty Ltd.

2. J Nominees Pty Ltd is the trustee company of the Citizen Family Trust which is owned jointly by John and Mary Citizen. Note that all distributions made by the trust are the responsibility of the trustee, i.e. J Nominee Pty Ltd which is owned by John and Mary Citizen.

Figure 5.3: Direct and Indirect Ownership Traces (Example 1)

John and Mary Citizen were cited in the ASX Datadiscs as being the founders of the company and both have been directors since its formation some 10 years earlier. Moreover John Citizen has been the executive director during that time, and both John and Mary Citizen had attended all directors' meetings in the past year. Interestingly in this case, Brian Citizen, also a director of ABC Ltd, has a small holding of shares (4%) within the diverse holdings percentage. It may be assumed that Brian Citizen is also a family member.

Figure 5.4 shows a further simplified example of the levels of searches required to determine the ownership structure of a listed company in the sample period.



From this example involving 12 levels of searching, we were able to provide evidence that Jane Resident direct and indirectly held in excess of 50% of the ordinary shares of OPQ Ltd. Moreover, she also held the position of MD for the period under observation.

Figure 5.4: Direct and Indirect Ownership Traces (Example 2)

5.3.2.5 Second Validation Procedure

A self-report questionnaire relating to family business definitional issues was developed and distributed to all members of the Emerging Accounting and Auditing Issues Group (EAAIG), a group comprising technical directors of the major Chartered Accounting firms, and financial and technical specialists from industry and regulatory bodies. The standardised instrument comprised four short questions covering the fundamental attributes of family business viz; control, ownership and dominance (see Appendix 1). The intent here was to solicit the views of technical specialists who would have the in-depth knowledge and experience to comment on a wide variety of issues relating to businesses in general.

The objectives of EAAIG are to discuss and resolve high-level technical issues that arise from time to time in relation to matters that impact on financial reporting. EAAIG membership usually requires that members have extensive technical knowledge and experience in accounting and audit. All members are therefore expected to have a sound knowledge of accounting standards and the Corporations Act, including relevant matters pertaining to ownership, control and dominance (particularly via Australian Accounting Standard AASB1024 – Consolidated Accounts).

Equipped with a sound knowledge of the above issues, it was intended that responses from EAAIG members would provide independent verification and thus validation of the definition of family business. A short presentation and discussion (of 20 minutes duration) outlining the objectives of the current research on 'Family Business and IPOs' was given by the author during the last meeting of the group held on 15 December 2000. To minimise the possibility of data error, the author explained all questions on the questionnaire and remained available during completion time to assist any member having difficulty understanding the requirements of the questionnaire. A total of 17 members (out of the 19 members present) completed and returned their questionnaires during the meeting. The balance of the membership, i.e. thirteen members, was canvassed through various means including, telephone calls, mail, email, or facsimile. Eight further responses were received and there were no additional follow-up procedures conducted. In all, 27 out of a possible membership of 32, were received. The results of the survey were processed using SPSS and are reported in Table 5.2.

Table 5.2: Questionnaire Results for Emerging Accounting and Auditing Issues Group.*

1. Family businesses have attributes that are different to non-family businesses.	**No = 0%; Yes = 100%**
2. Important attributes of family business.	**Highly Appropriate**
(a) Ownership	100%
(b) Control Structure	100%
(c) Management Structure	93%
(d) Debt/Equity Mix	29%
(e) Performance	18%
(f) Firm Size	37%
(g) Firm Age	48%
3. Definition of a Family Business	**Defined As**
(a) Control	7%
(b) Ownership	11%
(c) Dominance	18%
(d) All of the above	52%
4. Importance of Dominance	**Highly Significant**
	96%

* Appendix 3 provides a copy of the actual survey instrument.

5.3.3 Stage 2: Determination of IPOs

To determine IPO firms and to delineate family controlled from non-family controlled IPO firms, the research design used in Stage 1 was extended to Stage 2. That is, several databases were used to analyse and validate corporate financial and non-financial information. Extensive tracing of common elements relating to the definition of family business (ownership, control, dominance etc.) were also undertaken using the ASIC database which, as in Stage 1, was used to further cross-validate and supplement data.

However, there were several added features in Stage 2 which were required to determine the final number of IPO companies. For instance, all Australian Stock Exchange (ASX) Annual Reports issued by the ASX during the periods 1988 to 1999 were examined for new listings in each year. Moreover, qualifying criteria were applied to all companies/entities listed during the observation period to determine whether the listing was in fact an IPO. An IPO was defined as a new company or private company converting to a public company, and listing on the Australian stock exchange for the first time. This approach is consistent with the IPO literature (particularly, Mustow, 1994; Steen, 1997).

Consequently, IPOs involving the following activities were excluded;

- Relistings,
- Refloats,
- Firms formed through schemes of arrangement,
- Firms listing via the Information or Explanatory Memorandum medium,
- Firms previously listed on a foreign stock exchange,
- Capital Reconstructions involving debt issues and convertible notes,
- Transfers from the Second Board
- Issues not involving a registered prospectus
- Seasoned (Rights) issues
- Non-company listings (for example, Trusts & Building Societies)

Following this procedure, a total of 604 IPOs, from a possible 898 new ASX listings during the twelve-year period, satisfied the IPO qualifying criteria.

After this procedure, various databases were then searched (using exactly the same approach as Stage 1 above), for information relating to the definition of a family business, viz; information that provided evidence of ownership, control, and continued dominance. The results from the application of this validation procedure revealed that 5 companies could not be categorized into either family or non-family groupings principally because data on the continuity of control by founding shareholders was unable to be reliably traced beyond the first year of listing. Effectively therefore the population was reduced to 600 companies of which 127 (21.2%) were family firms and 473 (78.8%) were non-family firms (although it is observed that the population of 604 IPOs was able to be used for analyses of information relating to all companies as a group, for example the calculation of the mean value of initial underpricing for all firms). Interestingly, the results of the final delineation process are different than those of the feasibility study in which 17.1% of the population were family firms and 82.9% were non-family firms.

It is also noted that during the database searches at this stage of the study, information relating to many of the independent variables used in the study were also sourced, for example, financial data, prospectus data, details relating to auditors and underwriters and so on. Additionally databases were used to access relevant financial and/or prospectus information, including Connect 4, Datastream and Sirca (all commercially available databases). This extensive process however, identified inconsistencies in the data source, particularly missing data, conflicting ('grey area') data between data sources, and in some cases non-existent data in respect to some companies. Notwithstanding, the ability to access several databases remedied most of these problems and in many cases cross-validated specific items of data.

Appendix 4 illustrates the detailed procedures used in determining the final number of qualifying IPOs, and the grouping of this sample into family and non-family firms.

5.3.4 Stage 3: Procedures for Calculation of Initial Returns

A significant proportion of studies in the IPO literature calculate the initial or abnormal gross return as the difference between the issue price and the closing price of a share on the first day of trading (e.g. Reilly, 1978; Beatty & Ritter, 1986; Chalk & Peavey, 1987; Dawson, 1987(b); Finn & Higham, 1988; Muscarella, 1988; Jain, 1994; Lee, *et al.*, 1994; Steen, 1997). Dawson (1987a) suggests that IPO underpricing should be based on the value of shares before dilution and not the market price after listing. That is, the offering price should be compared to the value of the shares without underpricing which itself can be derived. Barry (1989) and McGuiness (1993a) support similar arguments.

Most studies use the closing price or first available after-market bid price (e.g. Finn & Higham 1988; Levis, 1990; Holland & Horton, 1993; Beatty, 1989; Slovin & Young, 1990; Drake & Vetsuypens, 1993) while some use weekly or even monthly closing prices (Carter & Manaster, 1990). Consistent with the majority of studies in the literature, the model adopted for calculating initial returns in this study is based on the difference between the offer price in the prospectus document and the closing price on the first day of trading.

Most studies have also adjusted raw initial returns for the potential impact of market movements and several different indices are used in this regard. In Australian studies for example, Finn and Higham (1988) used the Melbourne All Ordinaries Index, whereas Woo and Suchard (1993), Lee, *et al.* (1994), and Steen (1997) used the All Ordinaries Accumulation Index. Several studies used the value weighted Statex Actuaries Accumulation Index, including How (1990) and Lee, *et al.* (1994) for part of their sample, and some used specific industry indices (Allen & Patrick, 1994). Interestingly, Steen (1997) provides a comparison of the All Ordinaries and Industry Accumulation indices based on different measurement dates, that is, the offer closing date and the day before listing. He found a high correlation in movements between the different indices.

Several contributors to the literature identify the problematic issue of systematic risk in models which adjust for market movements (Brown & Warner, 1980; How, 1990; Steen, 1997). In Australian studies for example, the All Ordinaries Index and the All Ordinaries Accumulation Index, both of which are not value weighted, are typically used to adjust raw returns for market movements. The underlying assumption in using these models is that all IPO firms have an average beta of one, that is, the same as the index. However, Aggarwal and Rivoli (1990) argue that this assumption is not correct given, inter alia, that the market will have had insufficient time to absorb information relating to the issue. Several studies have also calculated beta for IPOs to be in excess of one. For example, Ibbotson (1975) found that the average beta of an IPO is 2.2 whereas Reilly (1978) estimated the average beta of an IPO firm to be 1.97. Bear and Curley (1975) found that on average over a two-year period subsequent to the issue, the beta of an IPO will approximate the value of 1.0. Moreover, Young and Zaima (1988) argue that betas cannot be determined for IPOs since the conventional calculation of beta is based on measuring historical returns against the index over time. Similar arguments are reported in Aggarwal and Rivoli (1990).

Brown and Warner (1980) use monthly US data to investigate the effects of using value weighted and equally weighted indices. They argue that value weighted indices bias the market adjusted returns upwards. To overcome this problem, How (1990), and Lee, *et al.* (1994) use the Statex Actuarial Accumulation Index (SAAI) to adjust raw initial returns. However, the publication of SAAI ceased during 1994 in Australia, precluding the use of this index for part of the IPOs in this study.

Therefore, the approach in Lee, *et al.* (1994) and Steen (1997) is adopted, that is, the Australian All Ordinaries Accumulation Index is used for adjusting raw returns for market movements. Moreover, the closing date of the offer was used as the base date for measuring movements in the market index (Steen, 1997).

5.3.4.1 Dependent Variables

5.3.4.1.1 Firm Underpricing

There are two dependent variables used in this study to determine underpricing: The raw initial return (UP_1), and; the market adjusted initial return (UP_2). However, (UP_2) is the variable used in all regression analyses with the various independent variables. To calculate raw returns, closing share prices on the day of listing were downloaded onto an Excel spreadsheet from the Datastream database and cross-validated against ASX daily quotation sheets. These prices were then compared to the issue price of each IPO share. Issue price was sourced from the prospectus documents via the various databases used in the study, principally Connect 4 and the ASIC databases. Raw returns were then adjusted for market movements by using the changes in the All Ordinaries Accumulation Index as measured by the percentage change in the index from the closing date of the share offer, and the day of listing. Both raw and market adjusted returns were then aggregated and average returns were calculated for all observations.

To test for capital market efficiency, cumulative average daily returns were calculated for a 20-day period for all observations. The standard deviation of returns was also calculated to determine variability of returns for all groups.

Two models were developed to capture raw and adjusted initial returns and these are discussed below.

Model 1 – Raw Initial Returns

(a) Raw Initial Returns

This model calculated raw initial returns as follows:

$$R_1 = P_0 - P_t$$

Where;

R_1 = The raw return on individual shares (UP_1)

P_0 = The initial offering price per share

P_t = The closing price on the share t days after the initial offering where t = {1...n}

(b) Cumulative Raw Returns (R_t)

The cumulative raw initial returns for each portfolio of IPO firms were calculated as follows:

$$R_t = \left(\sum_{i=1}^{N} R_{it}\right) \Big/ N$$

Where;

R_t = Cumulative Raw Returns in period $_t$

R_{it} = Raw returns on Security I in period $_t$

N = Number (Sample) of IPO firms,

i = 1

Model 2 – Market Adjusted Initial Returns (Individual & Cumulative Returns)

(a) Market Adjusted Initial Returns

The excess initial returns are calculated using the methods employed by Finn and Higham (1988), Kim *et al.* (1993), Jain (1994), Lee, *et al.* (1994) and Steen (1997). Initial returns represent the gross return accruing to an investor who subscribes to an IPO issue and sells at the closing price at the end of the first day of listing. Share price data were accessed from the Datastream database (a commercial database resource) and validated against the Australian Stock Exchange daily quotation sheets.

Excess returns on individual shares were calculated using the following standard formulae:

$$AR_{it} = R_{it} - R_{mt}$$

Where;

AR_i = The abnormal (excess) return on security i, (UP_2)

R_i = The raw return on security i

R_m = The return on the market portfolio (All Ordinaries Accumulation Index)

t = The observed trading day, where $_t$ = 1 is the initial day and days 2 - 20 **after-market trading days.**

The excess return for each IPO is calculated as:

$$AR_{it} = \left[\left(\frac{P_t - P_0}{P_0}\right) - \left(\frac{I_t - I_0}{I_0}\right)\right] \times 100$$

Where;

P_t = The closing price of the share t days after the initial offering where t={1..,n},

P_o = The initial offering price of the security,

I_o = The value of the All Ordinaries Accumulation Index at offer closing date

I_t = The value of the All Ordinaries Accumulation Index t days after the offer

(b) Cumulative excess returns for a portfolio of IPO firms (AR_t)

The cumulative excess returns for the each portfolio of IPO firms were calculated as follows:

$$AR_t = \left(\sum_{i=1}^{N} AR_{it}\right) \Big/ N$$

Where;

AR_t = Ccumulative market adjusted excess returns for a portfolio of firms in time period t

AR_{it} = Adjusted initial returns on security I in period $_t$

N = Number (Sample) of IPO firms,

i = 1

The results of Models 1 and 2, in which the average level of raw and market adjusted underpricing was determined for the entire population, were compared with the average results of three major international studies: Canada - Jog and Riding (1987); US – Ritter (1984b); UK – Levis (1993); Hong Kong – McGuinness (1993a); and Singapore – Koh and Wa; 1989). Moreover, Model 2 uses statistical procedures that compare the average level of raw and market adjusted underpricing between family and non-family IPO groupings.

5.3.4.1.2 Firm Value

Although there are several proxies for firm value identified in the literature, the most popular include market capitalisation of all ordinary shares issued after the IPO, and total assets at the time of listing. Following the approach adopted in How and Low (1993), firm value is determined by multiplying market share price at day 20 post-listing times the total number of ordinary shares issued after the IPO share.

5.3.5 Stage 4: Procedures for Calculation of Long-Term Operating Performance

Several measures of operating performance are documented in the IPO literature and, indeed, in an extensive range of other studies that examine the operating performance of firms generally. Typically however, most studies focus on financial variables encompassing cashflow measures, earnings based measures or a combination of both. Mikkelson and Shah (1993) and Jain and Kini (1994) for instance, use proxies for cashflow to measure operating performance, whereas Megginson, Nash and Van Radenborgh (1994), Degeorge and Zeckhauser (1993), and Balatbat (2001) use earnings based measures.

Jain and Kini (1994) used two cash flow variables as proxies for operating performance:

- Operating Return on Assets (JKROA), which was calculated by dividing operating income (before tax and depreciation, and amortisation) by total (unadjusted) assets, and
- Operating Cash Flows on Assets (JKCFOA), which was calculated by dividing operating cash flow (minus capital expenditure) by total assets.

The authors posit that JKROA provides a measure of the efficiency of asset utilisation, whereas JKCFOA is a useful measure of operating performance since it is a "primary component in net-present-value calculations used to value a firm" (p. 1704). Moreover, changes in operating performance are measured as the median change in the relevant performance indicator in each year t relative to year t_{-1}, i.e., the median value of {operating returns in year t less the operating returns in year t_{-1}}.

Jain and Kini's (1994) study attempts to measure improvements in the operating performance of firms in the first few years' post-listing. The median value was used as the authors argue that operating performance measures may be skewed and the mean is extremely sensitive to outliers. This approach is consistent with several other studies that use median values to measure operating performance, including Kaplan (1989), Smith (1990), Muscarella and Vetsuypens (1989a) Degeorge and Zeckhauser (1993), McConaughy (1994) and Balatbat (2001), although Balatbat also reports mean values.

Several other studies use earnings or cashflow-based measures for calculating operating performance of IPO firms. For example, Mikkelson and Shah (1993) use operating income deflated by sales where operating income is defined as net income before depreciation, taxes and extraordinaries. Similarly, Degeorge and Zeckhauser (1993) use operating income before depreciation divided by total assets, whereas Holthausen and Larcker (1996) use two measures, operating income before interest, tax and depreciation over total assets, and operating cash flows before interest and tax over total assets. In contrast, Healy, Palepu and Ruback (1992) use pre-tax operating cash flow divided by total assets, while Barber and Lyon (1997) use operating income before interest, tax, special items and minority interests divided by 'assets-in place' (i.e., assets less cash and marketable securities). Balatbat (2001) uses two measures of operating performance, operating profit before interest and tax divided by end-of-period, and cash from operations divided by assets-in-place.

In this study, four measures of operating performance were used,

- Operating Return on Assets (JKROA) was calculated by dividing operating income (before tax and depreciation, and amortisation) by total (unadjusted) assets (Jain and Kini, 1994);
- Operating Cash Flows on Assets (JKCFOA) was calculated by dividing operating cash flow (minus capital expenditure) by total assets (Jain & Kini, 1994);
- Earnings before interest and tax (EBIT) divided by total assets (STROA), which is a standard profitability measure supported by Australian security analysts (Securities Institute of Australia, 2001), and;

- Cash flows from operating activities divided by total assets (STCFOA), which measures the quality of earnings (Securities Institute of Australia, 2001).

Australian Accounting Standard AASB1026 requires cashflows from operating activities to be disclosed in the Statement of Cash flows, hence this information is readily available in financial reports prepared by listed Australian companies. However, for periods prior to the introduction of AASB1026 (i.e. pre 1992), this information was not available and thus analysts calculated cashflows from operations by using the following equation: cash flows from operating activities = net operating profit plus expense items not affecting working capital (such as, for example, depreciation, depletion, and amortisation), less revenue items not affecting working capital (such as share of profits in associated investee companies) plus (minus) decreases (increases) in non-cash assets, plus (minus) increases (decreases) in current liabilities not including those amounts of long term debt payable within the current period. This latter procedure was applied in this study when cashflow from operating activities was not readily available, and is used in a number of studies including Balatbat (2001) and Barber and Lyons (1995). As an aside, it is perhaps also worth noting that this procedure is not new, and is indeed a well known audit (and banking) technique used in reconstructing accrual income statement items to derive cash flows from operations.

Each of the four variables was expressed in ratio form, and changes in operating performance were measured as the median change in the performance indicator each year t relative to year t_{-1}. In start-up cases (i.e., where firms had no prior trading history), changes in operating performance were measured relative to year M_0, which was the first year in which the annual financial statements were prepared. Moreover, following Balatbat (2001), the mean changes in operating performance were also computed in the study, although the results have not been reported other than for information purposes in the relevant Appendices. The mean changes in operating performance were measured as the mean value of changes in each performance indicator in year t relative to year t_{-1} (for instance in the case of changes in JKROA for years -1 & 0, the mean change would be calculated as the mean of $\{JKROA_0 - JKROA_{-1}\}$).

The source data for calculating the operating performance variables comprised financial information sourced from the various data bases described above. Data was collected for a four-year period commencing in Year -1 (year prior to listing), Year 0 (the year of listing), Year +1 (first year after listing) and Year +2 (second year after listing). Where financial statements were not prepared in the year of listing, comparatives were used in subsequent financial reports or zero values (designated as missing values) were entered for that period if no other information was available.

5.3.5.1 Comparison Measures

As mentioned above, Jain and Kini (1994) measured the change in operating performance as changes in the median value of the performance indicator relative to year -1. Additionally they adjusted operating performance for industry influences by matching each IPO firm with firms in the same industry using three-digit Standard Industrial Classification (SIC) [illegible]s. The industry-adjusted performance of the IPO firm is thus the "difference between its change in operating performance and the median change in the operating performance of all firms in the industry" (p. 1705). Differences represent the performance (or abnormal) return attributable to the firm in the absence of influences attributable to industry and economy factors, thus reflecting the 'true' measure of firm performance. Indeed an analogy can be drawn with this procedure and the use of a Market index to calculate the abnormal returns attributable to underpricing. A similar approach is documented in McConaughy (1994), Barber and Lyons (1995), and Balatbat (2001).

In this study however, adjusting IPO operating performance against an industry performance measure was not possible due to the lack of available data for IPO firms. For instance, after segregating IPO firms into family and non-family firms, and then into their respective industries using the ASX industry classification system, the number of IPO firms within each industry category (with the exception of mining) was reduced substantially, posing group size problems for parametric tests. This problem was further exacerbated by lack of available data for the base year (i.e., Year -1) and subsequent years for start up firms (Year 0) upon which changes in operating performance were calculated. Consequently, changes in operating performance were not calculated for observations which lacked 'base-year' information (particularly net operating profit, EBIT and total assets). These cases were subsequently removed thus further reducing the number of observations within both family and non-family groups. Given these problems, operating performance measures were not industry adjusted and hence comparisons need to be considered in light of this limitation. However, meaningful comparisons of operating performance were conducted between family and non-family firms given that 'size-effect' problems were overcome by use of a deflator in the measurement variables, i.e., total assets.

In addition, changes in operating performance were compared by firm type after allowing for mining influences. That is, changes (each year relative to year-1) in the median value of operating performance of family IPO firms were compared to family IPO firms within the non-mining group. Moreover, significance testing was undertaken using non parametric (Mann-Whiney U) tests.

5.3.5.2 Independent Variables

In an attempt to provide some explanations for changes in the level of operating performance several studies examine the relationship between measures of operating performance and a range of endogenous and exogenous variables. For instance, Jain and Kini (1994) examine the level of retained ownership, sales growth, asset turnover and capital expenditure. Retained ownership was measured as the level of equity held immediately after the share issue (imputed estimates of post-offering holdings retained by pre-offering shareholder) and the operating performance of firms with higher equity levels (>73.12%) was compared with the operating performance of firms with lower equity levels (<73.12%). This procedure was only taken for the year in which the IPO listed, yet comparisons were made with the level ('one-time' measurement) of ownership and performance measures in periods subsequent to listing. This approach could be considered as a potential limitation given that level of ownership retained by founding shareholders further diminishes in periods subsequent to the initial issue period (Balatbat, 2001). Moreover, by using an imputation process Jain and Kini (1994) did not directly measure the level of retained ownership of the IPO firm after listing and this procedure could also be regarded as a potential limitation (Mikkelson, *et al.* 1997).

Perhaps a more robust approach in measuring the level of retained ownership for comparative purposes is to calculate the measure on a time-series basis, i.e., in each year after the listing as illustrated in Balatbat (2001). In the present study, however, the level of retained ownership is a cross-sectional measure and is calculated as the number of shares retained by founding/existing shareholders after listing. The analysis is based on the following assumptions:

1. The level of retained ownership of original owners declines significantly immediately after the issue (Mikkelson, *et al.* 1997; Balatbat, 2001);
2. The decline in the level of managerial ownership is only significant in the year of listing (Balatbat, 2001), and;

3. The level of holdings by the top 20 shareholders continues to be stable for a period of five years post listing (Balatbat, 2001).

It is not unreasonable to assume that retained equity measured immediately after the period of issue is relatively stable, at least for a period of two to three years. Indeed, to determine whether firms continued to qualify as either family or non-family firms in the current study, ownership levels of shares held by original founders and other related parties were checked for any significant changes in holdings for a three-year period subsequent to the year of offering. Consistent with Balatbat (2001), holdings by major shareholder were found to be relatively stable over a three year period. Accordingly, in this study, comparisons of operating performance against the level of retained earnings are made on the basis that retained earnings is a cross-sectional measure undertaken in the period immediately after listing. This information was sourced from IPO prospectus documents and other ASIC documents relating to shareholdings before and after listing.

Jain and Kini (1994) used a dichotomous classification procedure to delineate higher ownership firms from lower ownership firms and in this regard applied an arbitrary 'cut-off' point of 73.12%. That is, firms with a retained ownership of greater than 73.12% fall within the high *alpha* group, whereas firms with a retained ownership of less than 73.12% fall within the low *alpha* group. An alternative to this approach was documented in Balatbat (2001), where IPOs falling within the upper quartile range of retained ownership are considered to be in the higher equity retention group, whereas IPOs falling within the lower quartile range of retained ownership were grouped within the lower equity retention group. Consistent with this approach, IPOs were delineated using the median value of retained equity. Thus, firms with lower equity retention were below the median and firms in the higher equity retention group were above the median.

Balatbat (2001) also examined the association between firm age and operating performance by using a dichotomous cut-off point of 5 years. Thus, firms falling below the 5-year cut-off point were classified as 'young', whereas firms falling above the cut-off point were classified as established. In this study however, an upper and lower cut-off range was considered. Therefore, firms falling within the quartile of observations were classified as young, whereas firms falling within the upper quartile range were classified as established. Moreover, several other variables were examined with operating performance, including the age of the firm in years, firm leverage measured as total liabilities divided by total assets and capital expenditure over total assets.

5.4 Operationalisation of Variables

Tables 5.3 to 5.6 provide a summary of the dependent and independent variables used in the study, including the manner in which these variables have been operationalised for the various procedures in the study, and the source of information for each variable.

5.4.1 Dependent Variables

Table 5.3 provides a summary of the dependent variables and the manner in which these variables are measured.

Table 5.3: Summary of Dependent Variables

Variables	Explanation
UP1	Unadjusted difference between issue price and first day trading price
UP2	Market adjusted UP1
FIRM VALUE	Number of ordinary shares issued after the IPO multiplied by closing market on day 20 after the issue
JKROA	Operating profit plus depreciation/amortisation and tax divided by total assets at end of period
JKCFOA	Operating profit plus depreciation/amortisation and tax less capital expenditure divided by total assets
STROA	EBIT divided by total assets at end of period
STCFOA	Cash flow from operating activities divided by total assets at end of period

5.4.2 Financial Variables (Operating Performance Analysis)

The variables shown in Table 5.4 have been used to calculate the various operating performance measures in the study and in some procedures are used as independent variables.

Table 5.4: Financial Variables

Variable Name	Explanation	Variable Name	Explanation
M1TOTLIA	Total liabilities for Year -1	**P1TOTLIA**	Total liabilities for Year +1
M1TOTASS	Total assets for Year -1	**P1TOTASS**	Total assets for Year +1
M1TAXEXP	Tax Expense for Year -1	**P1TAXEXP**	Tax Expense for year +1
M1CFOPER	Cash flows from operating activities Year-1	**P1CFOPER**	Cash flows from operating activities Year+1
M1DEPREC	Depreciation expense Year -1	**P1DEPREC**	Depreciation expense Year +1
M1INTEXP	Interest expense Year-1	**P1INTEXP**	Interest expense Year+1
M1NOP	Net operating profit Year-1	**P1NOP**	Net operating profit Year+1
M0TOTLIA	Total liabilities for Year 0	**P2TOTLIA**	Total liabilities for Year +2
M0TOTASS	Total assets for Year 0	**P2TOTASS**	Total assets for Year +2
M0TAXEXP	Tax Expense for Year 0	**P2TAXEXP**	Tax Expense for year +2
M0CFOPER	Cash flows from operating activities Year 0	**P2CFOPER**	Cash flows from operating activities Year+2
M0DEPREC	Depreciation expense Year 0	**P2DEPREC**	Depreciation expense Year +2
M0INTEXP	Interest expense Year 0	**P2INTEXP**	Interest expense Year+2
M0NOP	Net operating profit Year 0	**P2NOP**	Net operating profit Year+2

5.4.3 Variables used in Underpricing and Firm Value Regression Models

The variables listed in Table 5.5 were used as independent variables in the various regressions models with firm value and underpricing as dependent variables.

Table 5.5: Summary of Independent Variables

Variable Name	Continuous or Dummy	Description of Variable
FB_NFB	**D**	Family Controlled Business/ Non- Family Controlled Business.
SIZE	**C**	Firm size (a composite measure of three variables), Total Assets **[PTOTASS]**, Total Sales **[PSALES]**, and Issue Size **[ISSSIZE]**
AGEYR	**C**	The age of the firm from the date of incorporation, i.e., **[LISTDATE]** less **[INCODATE]**
RISK	**C**	Ex ante uncertainty as measured by the after market standard deviation of returns over a 20 day period. **[STE-DEV]**, log of firm assets, log of firm age, and log of issue size.
ISSSIZE	**C**	The number of shares subscribed multiplied by the issue price
AUDREPT	**D**	Auditor reputation (Big 6 firm or other firm). 1 = Prestigious Auditor (Reference Group) 0 = Non-Prestigious Auditor (Comparison Group)
UNDWREP	**D**	Underwriter reputation based on frequency of underwriting engagements 1 = Prestigious Underwriter (Reference Group) 0 = Non-Prestigious Underwriter (Comparison Group)
FRACOWNE	**C**	Fractional ownership as measured by the total ownership retained by the existing owners.
MKTCYCLE	**D**	Market volatility as measured by trends in the market index during specific market cycles. Four dummy variables representing four distinct cycle periods have been used.
PROFFORC	**D**	The existence of an Profit Forecast in the prospectus 1 = Without Profit Forecast 0 = With Profit Forecast
PRPST	**D**	Pre and post Corporations Law 1 = Pre Corporations Law 0 = Post Corporations Law
PSALES	**C**	Sales as listing on the prospectus
PTOTASS	**C**	Total assets as listed in the prospectus
MINING	**D**	Mining firm or non-mining firm
STD-DEV	**C**	Standard deviation of changes in share returns for 20 days after listing

5.4.4 Data Sources

The procedures for sourcing data for the independent variables and some dependent variables (particularly operating performance variables) are documented in Table 5.6

Table 5.6: Procedures for Sourcing Independent/Dependent Variables

Variables	Data Sought	Procedures
Firm Size	Gross Assets, Gross Revenue and Issue Size	Access financial statements from various databases including ASIC, Connect 4, Thompson's Financial Services, and hardcopy and microfiche files sourced from State Libraries (Victoria and NSW) and Monash University and RMIT
Company Age	Date of Incorporation	Access from ASIC database
Ex ante Uncertainty	Standard deviation in share price returns after listing	Access share price data from Datastream for 20 days after listing
Firm Risk (other than ex ante uncertainty variables)	Ex ante uncertainty (as measured by the standard deviation of post-issue movements in share price), firm assets, issue size and firm age	All of the data sought is based on existing variables determined by other procedures as outlined in this section of the study
Issue Size	The number of shares subscribed multiplied by the issue price	Access data from prospectus documents via the various databases listed above
Auditor Prestige	Grouping within or outside the Big 6 firm categorisation	Access from Business Review Weekly (BRW) listings of Big 6 firms by amount of fees
Underwriter Prestige	Grouping within or outside top 16 firm categorisation	Access from various Annual ASX Journals (based on number of engagements and fee base)
Fractional Ownership	Percentage ownership of ordinary shares held by insiders following offer, divided by the total number of ordinary shares issued following offer	Review Prospectus and calculate ratio, review ASIC records post-listing for ongoing continuity of control.
Market Cycles	Upswings and Downswings in All Ordinaries Accumulation Index and dates of continuous and sustained movements in +/-	Review annual ASX Journals

	direction following previous high/low	
Pre and Post Corporations Law Listings	Details of firms listing before and after the date of introduction of Corporation Law	Review Commonwealth Government Gazette & CCH Corporations Law for date of application and ASX annual listings
Profit Forecast	Existence in prospectus	Access and review prospectus
Gross Sales	Total sales on listing date	Access and review prospectus – where possible, validate data against comparatives in first annual accounts
Gross Assets	Total assets on listing date	Review Prospectus and financial details in the proforma balance sheet

JKROA	Operating income, income tax expense, depreciation expense and total assets	**Financial Information prior to listing:** Review prospectus documents, comparatives financials in first set of annual reports post listing, and other relevant data from the ASIC database. **Financial Information after listing:** Review annual reports accessed from various sources
JKCFOA	Cashflows from operating activities, capital expenditure and total assets	**As Above**
STROA	Operating income, income tax expense, interest expense and total assets.	**As Above**
STCFOA	Cashflows from operating activities and total assets	**As Above**
Ageyr	Company age in years	**ASIC documents and company prospectus**
Lev	Total liabilities and total assets	**Annual financial reports**
fracowne	Share ownership by original shareholders	**ASIC documents and company prospectus**
capexp	Capital expenditure	**Annual financial reports**

Note that JKROA, JKCFOA, STROA and STCFOA ratios were calculated for each year over a four-year period using Excel. The change in these ratios was then calculated each year relative to Year -1 and consistent with the approach in Jain & Kini (1994), mean and median values were used to make comparisons of operating performance between family and non-family firms.

5.5 Statistical Procedures for Data Analysis

5.5.1 Regression Models – Initial Underpricing

This section explains the development of statistical models which examine the relationships between the level of underpricing and endogenous and exogenous variables affecting the firm, and the strength of these relationships by examining family and non-family IPOs.

The literature identifies an extensive range of techniques which test the relationships between the extent of underpricing and particular independent variables. Jog and Riding (1987) for instance argue that the most commonly used techniques include;

1. *Cross-sectional multiple regression techniques.*

These techniques use cross-sectional continuous variables and dummy variables to measure quantitative and qualitative factors (such as size of firm, age of firm, reputation effects)

2. *Model analysis of multivariate techniques*

These techniques involve the analysis of variances (ANOVA) to determine the proportional effects of various qualitative attributes.

While this study principally employs a combination of univariate and multivariate regressions to determine relationships between underpricing (and degree of underpricing) and selected independent and moderating variables, the various techniques articulated in the literature have been explored in terms of their relevance to the study. This study utilises a multiple least squares regression, which assumes the following forms:

<u>Univariate WLS Regression</u>

$$Y(DV) = \beta_0 + \beta_1(IV) + \beta_2(MINING) + \varepsilon$$

Where;

$Y(DV)$	=	Market adjusted underpricing (UP_2) or firm value (FIRM VALUE)
$\beta_1(IV)$	=	Independent variables selected
$\beta_2(MINING)$	=	Dummy variable, Mining = 1, Non-Mining = 0

and,

<u>Multiple WLS Regression</u>

$$\begin{aligned} Y(DV) \; = \; & \beta_0 + \beta_1(FB\_NFB) + \beta_2(MINING) + \beta_3(AGEYR) + \beta_4(ISSUE\ SIZE) + \\ & \beta_5(AUDREPT) + \beta_6(UNDWREP) + \beta_7(FRACOWNE) + \beta_8(FIRM\ VALUE) + \\ & \beta_9(STD\_DEV) + C_0 + \varepsilon \end{aligned}$$

Where;

$Y(DV)$	=	Market adjusted underpricing (UP_2) or firm value (FIRM VALUE)
β_1(FB_NFB)	=	Dummy variable - Family = 0, and Non-family = 1
β_2(MINING)	=	Dummy variable - Mining = 1, and Non-mining = 0
$^2{}_3$(AGEYR)	=	Log of firm age in years
$^2{}_4$(ISSSIZE)	=	Log of issue size
$^2{}_5$(AUDREPT)	=	Dummy variable - with auditor = 1, without = 0
$^2{}_6$(UNDWREP)	=	Dummy variable - with underwriter = 1, without = 0
$^2{}_7$(FRACOWNE)	=	Level of fractional interest retained by existing shareholders
$^2{}_8$(FIRM VALUE)	=	Log of number of ordinary shares multiplied by market share price day on 20
$^2{}_9$(STD_DEV)	=	standard deviation of share returns days 1-20

During data screening procedures, bivariate scatter plots for several combinations of variables (e.g., market adjusted underpricing, firm value, fractional interest) identified distributional properties which suggested heteroscedastic forms. As the form of heteroscedasticity was known for these combinations of variables, *weighted-least squares* regression analyses were performed between market adjusted underpricing and firm value as the dependent variables and a selection of independent variables such as fractional interest, risk, size, family business, non-mining companies, etc. The hypothesized models were examined using both asymptotic covariance and polychoric correlation matrices, which were subsequently used to produce weight matrices for the weighted least squares estimation procedures. In addition, the matrices were computed using listwise deletion of missing data, hence the discrepancies in sample sizes throughout the regression analyses.

Moreover, to test whether firm type (FB_NFB) moderated the positive (negative) relation between the dependent variables and specific independent variables , a univariate regression with factorial ANOVA was employed. Typically this entailed regressing the dependent variable with nominated independent variables as covariates together with and firm type (FB_NFB), and Mining as fixed factors. The general linear univariate model assumes the following form;

$$Y(DV) = \beta_0 + \beta_1(IV) + \beta_2(MINING) + \beta_3(FB\_NFB)$$

Where;

$Y(DV)$	=	Market adjusted underpricing (UP_2) or firm value (FIRM VALUE)
$\beta_1(IV)$	=	Independent covariates selected
$\beta_2(MINING)$	=	Dummy fixed variable - Mining = 1, and Non-mining = 0
$\beta_3(FB\_NFB)$	=	Dummy fixed variable - Family = 0, and Non-family = 1

5.5.2 Regression Models - Long-Term Operating Performance

Jain and Kini (1994) conducted cross-sectional regressions between operating performance and underpricing together with a dummy variable to differentiate between lower and higher retained equity groups. Balatbat (2001) conducted an annual and pooled ordinary least squares regression (OLS) between firm performance and a range of independent variables including, firm age, retained ownership, and firm leverage. In this study, both univariate and multivariate regressions models were employed to empirically examine whether there were associations between the operating performance of IPO firms and specific factors known to provide signals of firm quality (e.g., retained ownership, capital expenditure, firm debt, leverage and firm age). The models assumed similar forms to the regressions models discussed in 5.4.1, however consistent with Balatbat (2001), pooled data was used for all dependent and independent variables. That is, data for years -1 through to +2 were combined. The regressions assumed the following forms;

Univariate Regressions

$$Y\beta_1(DV) = \beta_0 + \beta_1(IV) + \beta_2(MINING) + \varepsilon$$

Where;

$Y\beta_1(DV)$	=	Operating performance measures*, JKROA, JKCFOA, STROA, and STCFOA
$\beta_1(IV)$	=	Independent variables selected (fractional interest [FRACOWNE], firm age [AGEYR], firm leverage [LEV], and capital expenditure [CPEXOA])
$\beta_2(MINING)$	=	Dummy variable, Mining = 1, Non-mining = 0

*Note also, separate analyses were conducted for each dependent variable, JKROA, JKCFOA, STROA and STCFOA.

and,

Multivariate Regressions

$$Y\beta_1 = \beta_0 + \beta_1(FRACOWNE) + \beta_2(AGEYR) + \beta_3(LEV) + \beta_4(CPEXOA) + \beta_5(MINING) + \beta_6(FB\_NFB) + C_0 + \varepsilon$$

Where;

$Y^2{}_1(DV)$	=	Operating performance measures* JKROA, JKCFOA, STROA and STCFOA
$B_1(FRACOWNE)$	=	The level of retained ownership by original shareholder after the issue
$^2{}_2(AGEYR)$	=	The age of the firm form date of incorporation in years
$^2{}_3(LEV)$	=	Total liabilities divided by total assets at end of period
$^2{}_4(CPEXOA)$	=	Capital expenditure divided by total assets at end of period
$B_5(MINING)$	=	Dummy variable - mining = 0, and non-mining = 0
$B_6(FB\_NFB)$	=	Dummy variable - family = 0, and non-family = 1

*Note also, separate analyses were conducted for each dependent variable, JKROA, JKCFOA, STROA and STCFOA.

Following the first stage of the univariate analysis, which uses a simple regression with industry effects, the second stage uses a factorial ANOVA to assess whether the addition of family and non-family firms (i.e. FB_NFB as a dummy variable) moderates the prediction of operating performance, that is in addition to those differences attributable to the specific independent variable together with industry effects. The general linear model for this analysis takes the following form;

$$Y\beta_1(DV) \;=\; \beta_0 + \beta_1(IV) + \beta_2(MINING) + \beta_3(FB\_NFB) + \varepsilon$$

Where;

$Y\beta_1(DV)$	=	Operating performance measures*, JKROA, JKCFOA, STROA, and STCFOA
$\beta_1(IV)$	=	Independent variables selected (fractional interest [FRACOWNE], firm age [AGEYR], firm leverage [LEV], and capital expenditure [CPEXOA])
$\beta_2(MINING)$	=	Dummy variable, Mining = 1, Non-mining = 0
$B_3(FB\_NFB)$	=	Dummy variable - family = 0, and non-family = 1

*Note also, separate analyses were conducted for each dependent variable, JKROA, JKCFOA, STROA and STCFOA.

5.6 Data Controls, Statistical Procedures and Transformations

5.6.1 Data Collection, Screening & Transformations

The following sections outline the controls and statistical procedures used in the study to ensure reliability and consistency of the data and to prepare the data for statistical analysis. Procedures used to determine the statistical significance of differences between groups, are also discussed in this section.

5.6.1.1 Reliability and Consistency

As discussed at some length at the beginning of this chapter, the research procedures in the study incorporated various 'data entry' controls to ensure accuracy of the data, including the use of ASIC's database, standardised procedures and forms, trained personnel and external validation of the data by ASIC personnel. Moreover, since secondary data subject to rigorous exogenous controls (such as accounting standards and other regulatory pronouncements) were the main source of information used in the study, reliability and consistency issues were not considered to be serious threats to outcomes of this research.

After the initial recording procedures in which company information was entered into *Excel* spreadsheets and checked for accuracy, the data were transferred into SPSS files and coded into continuous and discrete variables. Further screening was then undertaken to check for any irregularities in the recording process, for example, for each variable, determining the range, minimum and maximum values, the mean value and the frequency of observations. Minimum values and maximum values were checked for appropriateness and affinity with measures of central tendency, particularly the mean. Indeed these procedures coupled with the physical observation of frequency tables, revealed several cases of extreme outliers, which in most cases were financial variables that were either significantly under or overstated. These were subsequently corrected.

5.6.1.2 Outliers

In addition to the above procedures, boxplots and scatterplots were used to check for significant outliers, particularly mean value comparisons (e.g. independent t – tests), and bivariate and multivariate regressions. As expected, these procedures identified several outliers in many of the variables, particularly the financial variables, which were further assessed for accuracy and relevant treatment. As explained above, outliers due to recording errors were corrected, however the treatment of outliers attributable to normal circumstances depended upon the size of the outlier and the particular statistical procedure to be employed. For instance, several financial variable outliers were attributable to three major company flotations, during the 12-year observation period, including the Commonwealth Bank of Australia Ltd (a former government controlled entities which privatised), AMP Ltd (a life insurance company which demutualised) and Colonial Bank Ltd (a life insurance company which demutualised). In analysing the operating performance of all companies (Stage 3 of the study), the financial attributes of the 'big three' IPOs were so significantly different from those of the remaining IPOs, it was necessary to trim these companies from the sample. However, certain variables for these firms, such as underpricing and particular ratios (e.g. firm leverage) did not exhibit the characteristics of outliers, and thus were not excised in some of the analytical models.

Other similar instances of outliers included three cases for the initial underpricing (UP2) variable; for example in one case the value of UP2 was $50, which was considered extreme given that the mean of UP2 for all observations was $0.32). To overcome the potential difficulties of this extreme type of outlier in the data, a number of thresholds/ceilings were established in SPSS as screening mechanisms. For instance, for UP2, $13.50 was set as the upper ceiling for market adjusted underpricing and effectively three outliers were screened from subsequent analyses.

Finally, outliers which had the potential to significantly influence the outcomes of the statistical regressions in the study were either trimmed or the overall data were transformed to achieve normality (see below for further discussion).

5.6.1.3 Missing Variables

Given the extensive number of variables used in the study, and the problems of sourcing files with complete information from the various databases, the problem of missing was pervasive for some variables, and more particularly for periods prior to listing. To ensure that there were no patterns of missing data which could potentially threaten the generalisationalabilty of the results, a Missing Value Analysis using SPSS MVA was undertaken for all variables. Most of the results of these analyses showed that missing data was randomly scattered in almost all cases and thus posed no threat to the validity of the results. However, missing variables for fractional interest showed forms which suggested non-randomness. Further analysis of the data revealed that most of the missing variables were for non-family start up-firms and in many cases the lack of data were erroneously recorded as missing variables, instead of a zero value (note that a value of '0' for some firms is consistent with the themes adopted in the study). Moreover, it was also observed that too few values were recorded for fractional interest which had the potential to threaten minimum group sizes for valid statistical analysis, and thus further data was sourced from additional databases. After the addition of this data, the missing variables for fractional interest showed random form.

To the extent that Central Limit Theorem requirements for minimum sample sizes was not violated, instances where information was not available for a particular variable (e.g., financial information in a particular year for a specific company) were treated as a missing value and thus not taken into consideration in computing the relevant statistical results,

5.6.1.4 Normality

Prior to any analyses, all continuous variables were screened for normality using both statistical tests and graphical tests. As expected for many of the variables, critical values for significance testing of both skewness (greater than +/- 2.5) and kurtosis (greater than +/- 3.0) were exceeded, and frequency distributions (histograms) confirmed the existence of non-normal forms in most cases. In most instances these forms were attributable to outliers which, as explained above, were either trimmed or filtered to achieve normality. In other cases however, non-normal forms were a result of naturally occurring phenomena and trimming of the data would not have been an appropriate treatment. For instance, within the total number of observations a considerable number of firms are start-up firms, with either no financial information or information with low values. Thus the distributions of the financial variables in many cases were both negatively skewed and highly kurtosed. In almost all cases however, normality was achieved by transformation procedures using natural logarithms. In some cases also, it was necessary to trim significant outliers before transformation procedures were applied.

Table 5.7 provides a list of dependent and independent variables that were statistically transformed.

Table 5.7: Statistical Transformations

Characteristic	Variable Name (Prior to transformation)	New Variable Name (After transformation)	Transformation Procedure
Firm Age	AGEYR	LNAGYR	Natural Logarithm
Total Assets	PTOTASS	LNTOTASS	Natural Logarithm
Total Sales	PSALES	LNSALES	Natural Logarithm
Issue Size	ISSSIZE	LNISSIZE	Natural Logarithm
Firm Value	FVALUE	LNFVALUE	Natural Logarithm
Market Adjusted Underpricing	UP2	LNUP2	Natural Logarithm

5.6.1.5 Linearity

In preparation for regression analysis, bivariate scatterplots were undertaken between pairs of variables to check whether both variables were normally distributed and linearly related. In most case the familiar 'oval-shaped' form was not present suggesting non-normality and non-linearity. However, the scatterplots were re-run after the treatment of outliers either via trimming or transformation of the data (or both) and exhibited more consistent forms.

5.6.1.6 Homoscedacticity

An important underlying assumption of homoscedacticity is that the variability of the scores of one continuous variable is "roughly the same at all values of another continuous variable" (Tabachnik and Fidell, 1996, p.80). Indeed in some cases in this study, the bivariate scatterplots described above, showed evidence of non-homoscedactic forms, or, what is commonly referred to as heteroscedascticity which in graphic terms means an unusually large 'bulge' either at the top or the bottom of the assumed regression line. These forms however, were substantially remedied by the treatment of significant outliers and transformation procedures described above, although the variable UP2 continued to show heteroscedactic tendencies. To overcome this problem, weighted least squares regression was used instead of the conventional ordinary least squares regression, for all tests of association between UP2 the various independent variables.

5.6.2 Tests of Significance

5.6.2.1 *t*-Tests

To test whether there were significant differences in the means of financial and other numeric variables (e.g., firm age) between family and non-family firms, independent *t* tests (student's *t*) were conducted. The mean and standard deviation of the variables of interest are taken into consideration in *t* tests which determine whether numerical differences in the means were significantly different from 0. In this regard, the level of significance that has been adopted throughout this study is set at the 5 % level. In addition, the assumption of equality of variances was tested using Levene's Test, that is, the assumption of equality of variances should not differ from 0 was assessed for all t-test calculations.

5.6.2.2 Mann-Whitney U Tests (non-parametric)

In certain cases, the use of t-tests was inappropriate either because the statistical assumptions underlying the Central Limit Theorem were potentially violated (e.g., when comparing the mean differences between family and non-family firms within the mining group, the number of observations for some independent variables was less than 20), or when the data were seriously skewed and an alternative measure other than the mean was used (for instance, the use of the median value in measuring changes in operating performance in Stage 4 of the study). In these circumstances it was more appropriate to use non-parametric statistics, and in particular, the Z-score was calculated by using Mann-Whitney U tests. Moreover, as with the *t*–test, the level of significance was set at 5 %.

5.6.2.3 Chi Square

Given that a number of discrete variables were used in this study, for instance with-prospectus/without-prospectus, with-prestigious auditor/without-prestigious auditor, pre and post Corporations Law, hot and cold market cycles and so on, it was important to determine whether these variables were independent of each other, particularly in relation to their association with the dependent variable. For example, to test whether there were differences in mean levels of underpricing (higher/lower) during periods of hot and cold markets, independent *t*-tests were conducted. Moreover, given that one of the most commonly used test of independence between two or more discrete (classificatory only) variables, is the Chi Square test, Chi Square testing was also conducted in this study. This is a non-parametric test which provides an indication of whether observed patterns between discrete variables are due to chance. In this study, contingency tables were constructed showing the levels of market adjusted initial underpricing with discrete variables using the cross-tabulation function in SPSS, and Chi Square tests of independence were applied to discrete variables in these procedures.

5.7 Summary and Conclusions

This chapter provides details of the research design and methodology used in this study. Various procedures are outlined in relation to definition of a family business, collection and analysis of data relating to initial price performance and operating performance. In addition, a detailed description of statistical procedures is provided.

Chapter 6: Profile of Companies

6.1 Introduction

This Chapter describes and explains data relating to the 604 qualifying IPOs used in the study. A profile of companies is provided, together with descriptive statistics relating to independent variables tested in both Stage 2 (Initial Underpricing), and Stage 3 (Operating Performance) of the study. The financial and other characteristics of the offer, other prospectus information, share price data, and specific characteristics of the 604 IPO firms have also been documented.

6.2 Part A – Descriptive Analysis

6.2.1 Distribution of Companies and Industry Classification

Table 6.1 shows that 21.2 % of the total qualifying IPOs were family businesses and that the proportion of family businesses to non-family businesses was irregular over the ten-year observation period. Qualifying IPOs (See Chapter 5) are those companies that listed for the first time ever, excluding rights issues, reconstructions, explanatory memorandums, trust issues and other similar offers to the public, and transfers from the main to the second board.

Table 6.1: IPO firms between 1 January 1988 and 31 December 1999

Year of Listing	All* Observations	Family Business	%	Non-Family Business	%
1988	22	4	18.2%	18	81.8%
1989	35	11	31.4%	24	68.6%
1990	15	1	6.7%	14	93.3%
1991	11	2	18.2%	9	81.1%
1992	30	4	13.3%	26	86.7%
1993	91	10	11.0%	81	89.0%
1994	102	23	22.5%	79	77.5%
1995	33	5	15.2%	28	84.8%.
1996	55	12	21.8%	43	78.2%
1997	64	8	12.5%	56	87.5%
1998	44	14	31.8%	30	68.2%
1999	98	33	33.7%	65	66.3%
Total	**600**	**127**	**21.2%**	**473**	**78.8%**
Average Per Year	50	10.58		39.42	

* Note that 4 firms were unable to be classified and are not included in this table.

Interestingly, there were a number of periods in which the percentage of family to non-family IPO firms was higher compared with other periods. For example in 1989, 31.4% FB compared to 68.6% NFB; in 1998, 31.8% FB and 68.2% NFB, and in 1999 where the percentage of FB to NFB was at its highest, 33.7% FB and 66.3% NFB. Moreover, the lowest ratio of family to non-family firms occurred in 1990, 6.7% FB to 93.3% NFB. The highest number of listings in the 12-year period occurred in 1994 (104 in total) compared with any other period.

Table 6.2 shows that IPO companies were widely disbursed amongst a broad range of industries. Several Australian studies have demonstrated similar findings including Balatbat, (2001) [Industrial Stocks], Steen (1997), and Lee *et al.* (1994). Perhaps of particular interest is the high concentration of IPOs in the Gold and Miscellaneous Industrials industry groupings, comprising 12.0% and 18.83% of all IPOs during the 12-year period respectively. While 'Miscellaneous Industrial' represented the largest single industry category, 'Resources' was the largest combined industry category, which accounted for over 24% of total IPOs that listed during the sample period (for the purposes of this study 'Resources' includes the sub categories; Gold, Other Metals, Diversified Resources, and Energy)

Table 6.2: Industry Distribution of IPO Companies

ASX Code	Industry Group	Frequency (All Firms)	%	Family Business	%	Non-Family Business	%
081-084	Alcohol and Tobacco	18	3.00	4	0.67	14	2.33
161-162	Banking & Finance	13	2.17	0	0.00	13	2.17
071-075	Building Material	11	1.83	5	0.83	6	1.00
101-105	Chemicals	2	0.33	0	0.00	2	0.33
061-065	Developers & Contractors	22	3.67	8	1.33	14	2.33
231-235	Diversified industrials	5	0.67	0	0.00	4	0.67
031-036	Diversified Resources	4	0.67	1	1.17	3	0.50
041-047	Energy	24	4.00	2	0.33	22	3.67
111-115	Engineering	20	3.33	3	0.50	17	2.83
091-096	Goods and Household	14	2.33	4	0.67	10	1.67
011-016	Gold	72	12.00	12	2.00	60	10.00
211-215	Health Care & Biotechnology	39	6.50	8	1.33	41	5.17
051-055	Infrastructure and Utilities	7	1.17	1	0.17	6	1.00
171-172	Insurance	10	1.67	0	0.00	10	1.67
191-196	Investment and Financial Services	46	7.50	4	0.67	31	6.83
151-155	Media	32	5.00	9	1.50	21	3.50
221-228	Miscellaneous Industrials	113	18.83	32	5.33	80	13.50
021-028	Other Metals	46	7.67	7	1.17	40	6.50
121-126	Paper and Packaging	4	0.67	0	0.00	4	0.67
131-135	Retail	31	5.17	9	1.50	22	3.67
181-184	Telecommunications	40	6.67	10	1.67	30	5.00
241-243	Tourism and Leisure	21	3.33	3	0.50	17	2.83
141-144	Transport	11	1.83	5	0.83	6	1.00
	Total	600	100.0	127	21.17	473	78.83

6.2.2 Offer Characteristics

In Table 6.3, the mean issue price for all observations was $0.91, whereas the mean issue price for the family group was $0.88 compared with $0.92 for the non-family group. The range of $0.88 to $0.92 suggests that there is little difference between these groups, at least in absolute terms. Interestingly, the lowest mean issue price of $0.41 was for the mining group.

Table 6.3: Offer Characteristics

Attribute(s)	All IPOs	Family and Non-Family		Mining and Non-Mining		Mining		Non-Mining	
		Family	Non-Family	Mining	Non-Mining	Family	Non-Family	Family	Non-Family
Issue Price									
Mean	0.91	0.88	0.92	0.41	1.08	0.41	0.41	0.97	1.11
Median	0.60	0.80	0.57	0.20	1.00	0.25	0.20	1.00	1.10
Total Offer ($m)									
Mean	47.33	24.85	53.58	32.90	52.48	22.13	34.51	25.36	60.97
Median	18.38	15.00	20.00	20.00	17.50	19.50	20.00	13.00	18.38
Issue Size ($m)									
Mean	76.69	31.01	89.40	25.60	94.54	7.68	28.29	35.34	113.00
Median	8.50	8.39	8.78	5.00	12.00	6.23	5.00	9.00	13.19

Table 6.3 also shows differences in absolute mean values for issue size between all groups. For example, $76.69m all observations; $31.01m family group; $89.40m non-family group, and; $25.6m mining group. The total offer for family firms is smaller compared to any other group, for instance, a mean value of $24.8m within the family group and $22.1m for family controlled mining companies.

6.2.3 Prospectus Characteristics

Table 6.4 shows that from a total of 523 valid observations, 336 (64.2%) firms had Profit Forecasts in their prospectuses, and within this group, 83 (24.7%) were family controlled firms and 253 (75.3%) were non-family controlled firms. It is important to note that even though the author had access to ASIC company information, not all prospectuses and background company information was accessible from these databases. This partly explains the discrepancy in observation sizes.

Table 6.4: Prospectus Characteristics

Attribute(s)	Group (Total Sample)	Family and Non -Family		Mining and Non-Mining		Mining		Non-Mining	
		Family	Non-Family	Mining	Non-Mining	Family	Non-Family	Family	Non-Family
Profit Forecast									
Yes	336	83	253	30	306	3	27	80	226
No	187	29	158	104	83	15	89	14	69
Underwriter Prestige									
Yes	251	45	206	47	204	4	43	41	163
No	303	76	227	86	217	14	72	62	155
Auditor Prestige									
Yes	401	79	322	89	312	12	77	67	245
No	175	46	129	51	124	7	44	39	85
Corporations Law									
Pre	72	16	56	24	48	1	23	15	33
Post	527	111	416	121	406	18	103	93	313

In addition, 63.2% (79/125) of family controlled IPOs had used prestigious auditors compared with 71.4% (322/451) for non-family firms, and 37.2% (45/121) of family firms had used prestigious underwriters whereas for non-family IPOs the results were higher with 47.6% (206/433) of firms having used prestigious underwriters. The data suggests that family business IPOs are more likely to use profit forecasts (74%, i.e., 83/112) compared with non-family IPOs (62%, i.e., 253/411). However, non-family firms are more likely to use prestigious underwriters (47.6%) and auditors (71.4%), compared with family firms (37.2% and 63.3%, respectively).

Among the total qualifying IPOs, there were 72 firms that listed prior to the introduction of the Corporations Law and 527 after the introduction of the Corporations Law on 1 January 1991. Within the pre Corporations Law group, 16 (13%) were family businesses and 56 (12%) were non-family businesses. Moreover, 111 (21.1%) of the IPOs that listed after the introduction of the Corporations Law were family firms and 416 (78.9%) were non-family firms.

This study classifies the reputation of the auditor by establishing dichotomous prestige groupings. The level of annual fees generated by the audit firm will determine whether the firm is a prestige firm (falling within the Big 6 band) or a non-prestige firm (not falling within the Big 6 band). Table 6.5 provides the BRW listing of large audit firms by amount of annual fees (note that the listing was taken for the period close to the end of the sample period, but is nonetheless representative of the audit firms that dominated audit practice for the entire sample period).

Table 6.5: 'Big 6' Prestige Ranking (Audit Firms by Total Fees)

Audit Firm	Estimated Fees ($USbn)
Arthur Andersen*	11.3
Ernst & Young	9.1
KPMG	9.0
Coopers & Lybrand**	7.5
Deloitte Touche Ross Tomatsu	7.4
Price Waterhouse**	5.6

* Merged with Ernst & Young in 2002
** Merged to form 'Coopers PriceWaterhouse in 1998
Source: Business Review Weekly (BRW) Magazine 19th January 1998 p63

This study used the frequency of underwriter engagements as an indicator of underwriter prestige for the top 21 underwriting firms. Table 6.6 provides the ASX listing of underwriter firms by number of engagements.

Table 6.6:Top 21 Underwriters by Number of Engagements (1989-1998)

Underwriter
J.B.Were & Son
Morgan Corporate Ltd.
Prudential Bache Securities (Australia) Ltd.
Paterson Ord Minnett Ltd.
Hartley Poyton Ltd.
D & D Tolhurst Ltd.
D.J Carmichael Pty Ltd.
SBC Warburg Australia Ltd.
McIntosh Corporate Ltd.
Potter Warburg Capital Market Ltd.
County NatWest Securities Australia
Macquarie Underwriting Ltd.
ANZ McCaughan Securities Ltd.
Wilson HTM Corporate Services Ltd.
Peake Lands Kirwan Pty Ltd.
Hogan & Partners
ABN AMRO Australia Hoare Govett (Securities) Ltd.
C.S. First Boston Australia Equities Ltd.
Sino Investment Service Pty Ltd.
Burdett, Buckeridge & Young Ltd.
Intersuisse Ltd.

Source: Various ASX Annual Journals 1988-1999

6.2.4 Market Cycles

There are several definitions of market cycles in the literature and generally, a cycle which is 'hot', will be characterized by higher volumes of offerings, evidence of deeper underpricing, and IPO oversubscriptions. Moreover, the reverse of these characteristics will normally apply to a cold market cycle. Typically, high/low volumes will be associated with market peaks/troughs, and in this regard, several studies use movements in an appropriate market index to capture the essence of market cycles.

In the Australian context, Figure 6.1 shows links between the number of IPO's and the performance of the All Ordinaries Index. For example, during the period between 1989 and 1998, it is observed that there are a greater number of new issues when the index is increasing and conversely a lower number of issues when the index is decreasing.

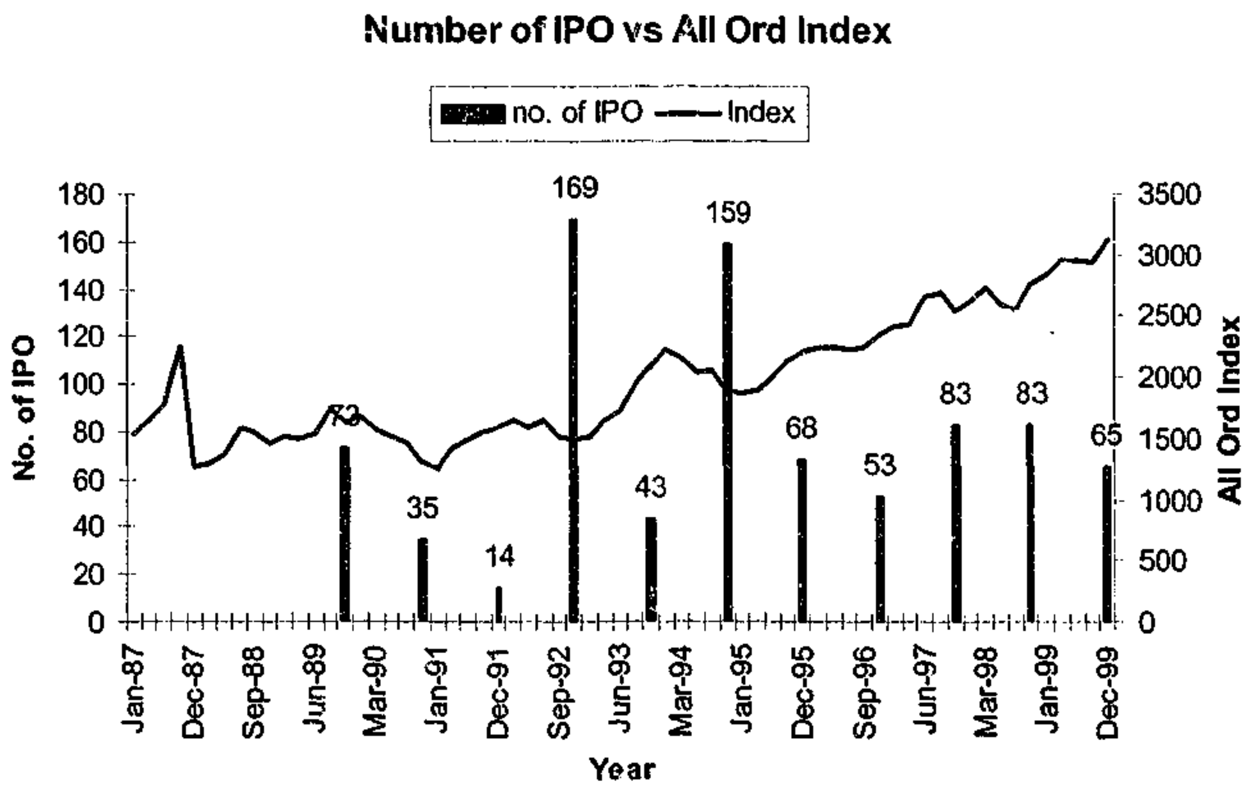


Figure 6.1: IPOs and All Ordinaries Index 1987 - 1999

Indeed, recent Australian studies provide evidence (see Steen, 1997), of a strong relationship between specific periods of upswings and downswings in the All Ordinaries Index, and the number of IPO's during a ten-year period, 1984-1994. Table 6.7 illustrates the specific dates for market upswings and downswings which have been utilised as the basis for market cycles in this study.

Table 6.7: Australian Stock Market Upswings/Downswings – 1988 –1998*

Start Period	End Period	Trend	Cycle
1 January 1988[1]	10 February 1988	Downswing	1
10 February 1988	29 August 1989	Upswing	2
4 October 1989	16 January 1991	Downswing	3
16 January 1991	22 May 1992	Upswing	4
22 May 1992	16 November 1992	Downswing	5
16 November 1992	3 February 1994	Upswing	6
3 February1994	8 February 1995	Downswing	7
8 February 1995	2 October 1997	Upswing	8
2 October 1997	28 October 1997	Downswing	9
28 October 1997	16 April 1998	Upswing	10
16 April 1998	16 June 1998	Downswing	11
16 June 1998	17 July 1998	Upswing	12
17 July 1998	1 September 1998	Downswing	13
1 September 1998	31 December 1998	Downswing	14

[1]Start of observation period
Source: Datastream – Continuous & sustained +/- movements in the All Ordinaries Accumulation Index from previous high/low (Various dates: 1988-1998)

In this study, the All Ordinaries Accumulation Index is examined for evidence of market cycles and 14 market cycles are represented by the dummy variable **MKTCYCLE**.

Table 6.8 shows that a there were a greater number of IPOs that listed during hot market periods (323, 53.9%) than in cold market periods (276, 46.1%), which appears to be consistent with several findings in the literature including Mustow (1994) and Steen (1997). Interestingly, more family controlled IPOs listed during hot market periods (81 or 64%) than cold market periods (46 or 36%) and 242 (51%) non-family controlled IPOs listed during hot market periods compared with 230 (49%) during cold market period).

Table 6.8: Market Cycles

Attribute(s)	Group (Total Sample)	Family and Non-Family		Mining and Non-Mining		Mining		Non-Mining	
		Family	Non-Family	Mining	Non-Mining	Family	Non-Family	Family	Non-Family
Market Cycles									
Hot	323	81	242	79	244	13	66	68	176
Cold	276	46	230	66	210	6	60	40	170

6.2.5 Firm Characteristics

A number of interesting observations can be made from the descriptive statistics in Table 6.9 relating to financial and non-financial firm factors as detailed in the prospectus. For example, the mean values of total assets, total liabilities and total sales, are all higher for non-family IPO firms compared with family IPO firms. A good indicator of the extent of the differences in these mean values between family and non-family firms is perhaps reflected in the ratio of NFB to FB. For instance, the ratio of NFB to FB for the mean value of total assets shown in the prospectus is approximately 52:1, 9:1 for the mean value of total liabilities, and 2:1 for the mean value of sales. A statistical analysis of these characteristics along with other firm attributes, is provided in the sections that follow.

Table 6.9: Firm Characteristics at Date of Listing (based on financial information disclosed in the Prospectus and ASIC information)

Attribute(s)	Group (Total Sample)	Family and Non-Family		Mining		Non-Mining	
		Family	Non-Family	Family	Non-Family	Family	Non-Family
Panel A: Financial							
Total Liability ($m)							
Mean	618.00	16.43	830.00	5.32	147.00	17.73	1,040.00
Median	4.70	5.63	4.27	0.38	0.22	7.12	6.68
Total Assets ($m)							
Mean	823.00	122.00	1,070.00	6.47	246.00	136.00	1,320.00
Median	15.09	18.26	13.30	2.04	1.16	27.09	18.49
Sales ($m)							
Mean	217.00	139.00	245.00	69.55	199.00	146.00	258.00
Median	14.70	12.23	14.82	76.05	21.44	11.80	13.26
Panel B: Non-Financial							
Fractional Ownership							
Mean (%)	32.77	53.21	26.32	42.44	19.22	55.12	28.54
Median (%)	34.20	55.28	19.23	43.00	8.61	57.92	24.03
Company Age							
Mean (years)	27.65	7.37	7.75	4.66	4.41	7.85	8.92
Median (years)	2.04	3.84	1.85	2.09	1.47	4.11	2.30
Leverage							
Mean (%)	42.42	43.18	42.16	62.84	28.42	40.87	46.14
Median (%)	40.45	35.25	42.29	74.64	12.69	31.25	45.94

6.3 Part B - Comparison of Means

Independent samples t-tests were used to compare differences in means for family and non-family IPOs as well as for mining and non-mining IPOs on financial and non-financial firm characteristics. Moreover, mean comparisons were conducted to provide an in-depth understanding of the independent variables in relation to firm type and industry. In selected cases, comparisons of medians were also made where the number of cases violated statistical assumptions or where the data exhibited significant skewness.

6.3.1 Non-Financial Characteristics

6.3.1.1 Fractional Interest

Table 6.10 shows that the mean level of fractional interest for all observations is 33%. When differentiating between family and non-family firms, fractional ownership is higher (53%) for family firms compared with non-family firms (26%), and as expected, results of independent *t-tests* indicate statistical differences between the two groups (t = 10.37 df = 221, p < .01). Moreover, when controlling for mining and non-mining, the mean value for the 'non-mining' group is 36%, compared with 23% for the mining group, reflecting lower levels of shareholdings by insiders in comparison to non-mining companies.

Table 6.10: Fractional Interest

Grouping	n	Mean Value	Median	St Dev	Min	Max	*t-stat*	*df*	sig
All Observations	437	.33	.35	.29	.000	.98			
Mining/Non-Mining									
Mining	95	.23	.19	.24	.00	.81			
Non-Mining	342	.36	.42	.29	.00	.98			
*t-tests**							4.194	176	.000
Family/Non-Family									
Family	106	.53	NC	.22	0.0	0.98			
Non-Family	331	.26	NC	.26	0.0	0.95			
*t-tests**							10.37	221	.000
Mining (FB/NFB)									
Family	16	.42	NC	.18	0.0	.97			
Non-Family	79	.19	NC	.23	0.0	.96			
*t-tests**							-4.37	26	.000
Non-Mining (FB/NFB)									
Family	90	.55	NC	.22	0.0	.99			
Non-Family	252	.29	NC	.28	0.0	.98			
*t–tests**							-9.16	202	.000

* Since Levene's test has a probability of < .05, equality of variances is not assumed.
** NC = Not Computed

When differentiating between family and non-family groups by mining and non-mining, the level of fractional interest changes considerably among these groups. For instance, the fractional interest for non-mining family firms is 55% compared with only 29% for non-family firms, and results of *t-tests* show that these differences are statistically significant (t = -9.16 df = 202, p < .01). For the mining group, fractional interest is also considerably different between family and non-family groups, for instance 42% for family controlled mining companies compared to 19% for non-family controlled mining firms. This demonstrates that the level of holding by insiders in family mining firms is more than twice the level for non-family mining firms. Moreover, results of *t-tests* show that these differences are statistically significant (t = -4.37 df = 26, p < .01).

6.3.1.2 Firm Age

Table 6.11 shows that on average, IPO firms that listed during the observation period had an operating history of 7.67 years. Moreover, family IPO firms are on average younger than non-family IPO firms; 2691 days (approx 7.37 years) compared to 2830 days (approx 7.75 years), although these results are not statistically significant (t = .306, df = 275, p > .05). These findings are not consistent with predicted values for family firms, although they are consistent with two noted contributors to the family business literature, namely Ward (1987) who found that on average family firms failed to survive the first generation and were therefore younger than non-family firms, and Daily and Dollinger (1992), who reported similar findings for family owned and managed manufacturing companies.

Table 6.11: Age of IPO Firms by Type of Firm

Grouping	n	Mean (Days)	Mean (Years)	Median (Days)	Std. Dev (Days)	Min	Max	t-stat	*df*	*sig*
All Observations	577	2,801	7.67	747	5,535	0	42,441	NA	NA	NA
Mining/Non-Mining										
Mining	136	1,621	4.44	564	3,152	62	24,645			
Non-Mining	441	3,164	8.66	903	6,040	1	42,441			
*t-tests**								3.884	444	0.000
Family/Non-Family										
Family	121	2,691	7.37	1400	3,978	32	24,985			
Non-Family	456	2,830	7.75	674	5,882	1	42,441			
*t-tests**								0.306	275	0.760
Mining (Group)										
Family	18	1,700	4.65		2,406	32	24,953			
Non-Family	118	1,608	4.40		3,259	1	44,448			
*t-tests**								0.143	27	0.888
Non-Mining (Group)										
Family	103	2,864	7.84		4,177	62	9004			
Non-Family	338	3,256	8.91		6,506	1	24,583			
*t –tests**								0.722	264	0.471

* Since Levene's test has a probability of < .05, equality of variances is not assumed.

It should be noted, however, that the mean values for firm age exhibit significant skewness (3.89 non-family business and 3.07 for family business respectively) and therefore median values may be more appropriate measures for firm age (Jain & Kini, 1994; McConaughy, 1994). In this regard, the median value for family firms is 3.83 years and is considerably higher than the median value for non-family firms, which is 1.85 years. This suggests that family firms are indeed older than non-family firms and is consistent with the hypothesis that family firms are older than non-family firms. Further non-parametric statistical tests (Mann-Whitney U) provide support for the proposition that family firms are older than non-family firms. For example Table 6.12 illustrates that the mean ranking of the median values for family firms is higher than non-family firms, i.e., 315 days for family firms compared with 281 days for non-family firms. Moreover, these results are statistically significant ($z = -1.972, p < .05$).

Table 6.12: Age of IPO Firms by Type of Firm (Mann Whitney Test)

Family/Non-Family	*n*	Mean Rank	*Z* -score	Asymp. Sig
Family	121	315		
Non- Family	456	281		
z - score			-1.972	0.049

In respect to mining and non-mining firms, Table 6.11 shows that non-mining IPOs on average have an operating history almost twice the length of mining companies; 8.66 years for non-mining compared with 4.44 for mining, and these results are statistically significant at the .01 level (t = 3.88 df = 444). Moreover, the median values in the mining/non-mining group also show that mining firms are younger than non-mining firms; 1.55 years and 2.47 years respectively.

When both non-mining and mining groups are further differentiated by family and non-family firms, the results show that mean values for family firms are lower (younger) than non-family firms in the non-mining group (7.84 years compared with 8.91 years), and higher (older) than non-family firms in the mining group (4.65 years compared to 4.40 years). However, the results for both groups are not statistically significant (t = .722, df = 264, p > .05) for mining, and (t = -.143, df = 27, p > .05) for non-mining. The median values for family and non-family firms similarly show that family firms are considerably older than non-family firms, 1400 days (3.84 years) compared with 674 days (1.85 years) respectively.

6.3.1.3 Underwriter Prestige

The results of cross-tabulations for underwriter prestige are shown in Table 6.13. More than 45.3% of all IPOs that listed between 1988 and 1999 used a prestigious underwriter, and more than 48% of IPO companies within the non-mining group used a prestigious underwriter, in contrast to only 35% in the mining group. Moreover, it would appear from findings that family IPO firms are less likely to use a prestigious underwriter than non-family firms in both the non-mining and mining groups. For instance, for the total non-mining group, family firms accounted for only 39.8% (41/103) of firms using a prestigious underwriter, whereas non-family firms accounted for 51.3% (163/318). Similarly, for the total mining group, family firms accounted for 3% of firms using a prestigious underwriter compared with 32% for non-family firms. However, the results of Chi-Square tests (conducted with continuity correction) do not show significant differences between family and non-family firms ($x^2 = 3.71$, $df = 1$, $p > .05$), between family and non-family within the non-mining group ($x^2 = 3.64$, $df = 1$, $p > .05$) and between family and non-family within the mining group ($x^2 = 0.97$, $df = 1$, $p > .05$). It should be noted however that the latter results should be interpreted with caution given the low sample size of family firms within the mining group.

Table 6.13: Cross-Tabulations of Underwriter Reputation by Type of Business

Panel A Non- Mining Group[a]	n	Non-Prestigious Underwriter	Prestigious Underwriter	Prestigious Underwriter as % of Total Group
Family Business	103	62 (28.6%)	41 (20.1%)	9.7%
Non-Family Business	318	155 (71.4%)	163 (79.9%)	38.7%
Total:	421*	217(100.0%)	204*(100.0%)	48.5%
Panel B Mining Group[b]				
Family Business	18	14 (16.2%)	4 (8.5%)	3%
Non-Family Business	115	72 (83.8%)	43 (91.5%)	32%
Total:	133*	86(100.0%)	47*(100.0%)	35%

*Note: The percentage of all IPO firms using prestigious underwriters for the total sample = (204+47)/(133+421))x 100 = 45.3%

[a] $x^2 = 3.64$, $df = 1$, $p > .05$,

[b] $x^2 = 0.97$, $df = 1$, $p > .05$

6.3.1.4 Auditor Prestige

The results of cross-tabulations for underwriter prestige are shown in Table 6.14. More than 69.6% of all IPO firms that listed within the sample period used a prestigious auditor and 71.6% of IPO companies within the non-mining group used a prestigious auditor, in contrast to 63.3% in the mining group. Moreover, family IPOs are less likely to use a prestigious auditor than non-family firms in the non-mining and mining groups. For instance, 63.2% (67/106) of family firms in the non-mining group used a prestigious auditor, whereas non-family firms accounted for 74.2% (245/330). Indeed, Chi-Square results (conducted with continuity correction) demonstrate a significant difference between type of business (family/non-family) within the non-mining group on the use of prestigious auditors (χ^2 = 4.23, $df = 1, p < .05$). Similarly, Panel B in Table 6.13 shows that family firms within the mining group accounted for 8.6% of firms using a prestigious auditor compared with 55.0% for non-family firms. However, Chi-Square results show no significant differences between type of business (i.e., family/non-family) on the use of prestigious underwriters (χ^2 = .000, $df = 1, p > .10$).

Table 6.14: Cross-Tabulations of Auditor Reputation by Type of Business

Panel A **Non- Mining Group[a]**	**n**	**Non-Prestigious Auditor**	**Prestigious Auditor**	**Prestigious Auditor as % of Total Group**
Family Business	106	39 (31.5%)	67 (21.5%)	15.4%
Non-Family Business	330	85 (68.5%)	245 (78.5%)	56.2%
Total:	436*	124(100.0%)	312*(100.0%)	71.6%
Panel B **Mining Group[b]**				
Family Business	19	7 (13.7%)	12(13.5%)	8.6%
Non-Family Business	121	44 (86.3%)	77(86.5%)	55.0%
Total:	140*	51(100.0%)	89*(100.0)	63.6%

*Note: The percentage of all IPO firms using prestigious auditors for the total sample = (312+89)/(140+436))x 100 = 69.6%,
[a] $x^2 = 4.23, df = 1, p < .05$
[b] $x^2 = 0.00, df = 1, p > .10$

6.3.1.5 Firm Size

Table 6.15 shows that there are significant differences in the mean (absolute) values of opening assets, sales and issue size between all groups. i.e., all observations, mining/non-mining, and family/non-family. For instance, the mean values for assets, sales and issue size are considerably larger for non-family firms ($1.07b, $245m, and $89m, respectively) than any other group type. However, there were no statistically significant differences between any of the groups for any of the variables.

Table 6.15: Assets, Sales and Issue Size by All Observations and Type of Firm

Grouping: Panel A	n	Mean	Std. Dev.	Min	Max	*t*-stat	*df*	*sig*
All Observations		$m	$m	$m	$m			
Assets($m)	297	823.00	6,390.00	0.00	94,700.00			
Sales($m)	269	217.00	1,160.00	0.00	14,700.00			
Issue Size(m)	548	76.69	633.00	0.00	14,200.00			
Mining/Non-Mining								
Mining								
Assets($m)	60	210.00	1,093.00	0.00	8,210.00			
Sales($m)	52	181.00	901.15	0.00	6,530.00			
Issue Size(m)	139	25.44	139.04	0.47	1,580.00			
Non-Mining								
Assets($m)	237	978.00	7,123.00	1.00	94,700.00			
Sales($m)	217	226.00	1,216.00	0.00	14,700.00			
Issue Size(m)	409	94.10	728.04	0.00	14,200.00			
*t-tests**								
Assets						1.588	272	.113
Sales						.304	100	.762
Issue Size						1.813	483	.071
Family/Non-Family								
Family								
Assets($m)	76	122.00	623.73	0.00	5,300.00			
Sales($m)	65	139.00	419.35	0.00	2,490.00			
Issue Size(m)	115	31.01	82.72	0.90	600.00			
Non-Family								
Assets($m)	220	1,070.00	7,399.00	1	94,700.00			
Sales($m)	201	245.00	1,321.00	0	14,700.00			
Issue Size(m)	430	89.40	713.36	0	14,200.00			
*t-tests**								
Assets						-1.877	227	.062
Sales						-.990	263	.323
Issue Size						-1.656	468	.098

Grouping: Panel B	n	Mean	Std. Dev.	Min	Max	*t*-stat	df	sig
Mining (Group)								
Family								
Assets($m)	8	6.47	11.60	0.007	34.5			
Sales($m)	6	69.55	59.71	2.5	1500.0			
Issue Size(m)	18	7.68	8.61	1.7	40.0			
Non-Family								
Assets($m)	51	246.00	1,184.00	0.0	820.0			
Sales($m)	45	199.00	968.55	0.0	650.0			
Issue Size(m)	120	28.29	149.49	0.47	16000.0			
*t-tests**								
Assets						-1.444	50	.155
Sales						-.886	46	.380
Issue Size						-1.494	123	.138
Non-Mining (Group)								
Family								
Assets($m)	68	136.00	658.54	0.0	5300.0			
Sales($m)	59	146.00	439.53	0.0	2500.0			
Issue Size(m)	97	35.34	89.40	0.90	6000.0			
Non-Family								
Assets($m)	169	1,320.00	8,408.00	0.0	9500.0			
Sales($m)	156	258.00	1,409.00	0.0	15000.0			
Issue Size(m)	310	113.00	834.19	0.0	140,000.0			
*t-tests**								
Assets						-1.812	173	.072
Sales						-.883	208	.378
Issue Size						-1.611	330	.108

6.3.1.6 Profit Forecast

The results of the cross-tabulation for profit forecast in Table 6.16 show that more than 64% (337) of all firms in the sample had a profit forecast in their prospectus documents, and more than 25% (83) of the firms with a profit forecast were family firms. Moreover, almost 9% (30) of the firms with a profit forecast were mining firms. The results also show that family IPO firms are more likely (x^2 = 135.71, *df* = *1*, p < .05) to include a profit forecast in their prospectus than non-family firms (74.01% family firms compared with 61.6% non-family firms). Moreover, within the non-mining group, 85.1% of all family firms compared with 76.6% of all non-family firm, had a profit forecast in their prospectus. While these results would suggest that family IPOs within the non-mining group are more likely to include a profit forecast in their prospectus than non-family firms, the differences between the two groups are not statistically significant (x^2 = 2.581, df = 1, p > .05). In addition there were significant differences between the mining and non-mining groups (x^2 = 5.501, df = 1, p < .05), indicating that mining firms are more likely to include a profit forecast in their prospectus in contrast to non-mining firms, and there were no significant differences between family and non-family firms within the mining group (although due to limited observations, the possibility of sample size error should be considered when interpreting the latter results)

Table 6.16: Cross-Tabulations of Profit Forecast by Type of Business

Grouping	n	Profit Forecast	No Profit Forecast
Panel A: All Observations			
All Firms	526	337(64.1%)	189(35.9%)
Panel B: Family/Non-Family*			
Family	112	83(25.9%)	29(38.4%)
Non-Family	411	253(74.1%)	158(61.6%)
Total	523	336(100.0%)	187(100.0%)
x^2 = 135.71, df = 1, p < .05			
Panel C: Mining/ Non-Mining			
Mining	135	30(8.9%)	105(55.6%)
Non-Mining	391	307(91.1%)	84(44.4%)
Total	526	337(100.0%)	189(100.0%)
x^2 = 5.501, df = 1, p < .05			
Panel D: Mining/Non-Mining and Family/Non-Mining			
Mining			
Family Business	18	3(10.0%)	15(14.4%)
Non-Family Business	116	27(90.0%)	89(85.6%)
Total	134	30(100.0%)	104(100.0%)
x^2 = 0.104, df = 1, p > .05			
Non-Mining#			
Family Business	94	80(26.1%)	14(16.9%)
Non-Family Business	295	226(73.9)	69(83.1%)
Total	389	306(100.0%)	83(100.0%)
x^2 = 2.581, df = 1, p > .05			

* Percentage within group with profit forecast, 74.01% family and 61.6% non-family.
# Percentage within group with profit forecast, 85.1% family and 76.6% non-family.

6.3.1.7 Pre-Post Corporations Law

An analysis of the descriptive statistics in Table 6.17 reveals that 527 firms in total (almost 88% of the observations) listed after the introduction of the Corporations law, and 127 of these firms (over 21%) were family firms. This distribution of results is principally attributable to the selection period for the study, i.e., a twelve-year period from 1 January 1988 to 31 December 1999. Since the Corporations Law was introduced on 1 January 1991, there were only three years of IPOs for the period prior to the introduction of the Corporations Law, compared with 9 years after the introduction of the Law.

Table 6.17: Cross-Tabulation of Pre-Post Corporations Law by Type of Firm

Grouping	n	Pre-Corporations Law	Post-Corporations Law
Panel A: All Observations			
All Firms	599	72(12.0%)	527(88.0%)
Panel B: Family/Non-Family			
Family	127	16(22.22%)	111(21.06%)
Non-Family	472	56(77.78%)	416(78.94%)
Total	599	72(100.0%)	527(100.0%)
$X^2 = 0.005, df = 1, p > .05$			
Panel C: Mining/ Non-Mining			
Mining	145	24(33.3%)	121(23.1%)
Non-Mining	454	48(66.7%)	406(76.9%)
Total	599	72(100.0%)	527(100.0%)
Panel D: Mining/Non-Mining and Family/Non-Mining			
Mining			
Family Business	19	1 (4.2%)	18 (14.9%)
Non-Family Business	126	23 (95.8%)	103 (85.1%)
Total	145	24(100.0%)	121(100.0%)
$X^2 = 1.86, df = 1, p > .05$			
Non-Mining			
Family Business	108	15 (31.3%)	93 (22.9%)
Non-Family Business	346	33 (68.8%)	313 (77.1%)
Total	454	48(100.0%)	406(100.0%)
$X^2 = 1.22, df = 1, p > .05$			

The results of the cross-tabulation for Pre-Post Corporations shows that 72 IPO companies listed prior to the introduction of the Corporations Law and 527 after the introduction of the Corporations Law. The results also show that 12.6% (16/127) of family firms listed in the pre Corporations Law period, whereas 87.4% (111/127) listed in the post Corporations Law period. Moreover, 11.9% (56/472) of non-family firms listed in the pre Corporations Law period compared with 88.1% (416/472) in the post Corporations Law period. Almost one third of all companies that listed in the pre Corporation Law period were mining companies. However, Chi-Square tests (conducted with continuity correction) demonstrate no significant differences between type of business (family/non-family) and pre-post Corporations Law listings, for all observations ($\chi^2 = 0.005$, $df = 1$, $p > .05$), for observations within the non-mining group (χ^2 = 1.22, df = 1, p > .10) and within the mining group (χ^2 = 1.86, df = 1, p > .05).

6.3.1.8 Market Cycles

Results in Table 6.18 show that more IPOs listed during hot market periods (53.9%) than cold market periods (46.1%) and these results are consistent with the findings in the literature. The results also show that more than 68% ot ·'l family firms listed in hot market periods in contrast to 32% in cold market periods. Interestingly however, the number of mining firms that listed in hot market periods was less than those that listed in cold periods, viz; 67 compared with 79. Evidently this was also the trend when mining was further divided into family and non-family, with less family mining firms listing during hot periods (6) compared with cold periods (13).

Table 6.18: Cross-Tabulation of Market Cycles by Type of Business

Grouping	n	Hot Cycle	Cold Cycle
Panel A: All Observations			
All Firms	603	325(53.9%)	278(46.1%)
Panel B: Family/Non-Family*			
Family	127	81(25.1%)	46(16.7%)
Non-Family	472	242(74.9%)	230(83.3%)
Total	599	323(100.0%)	276(100.0%)
x^2 = 5.808, df = 1, p < .05,			
Panel C: Mining/ Non-Mining			
Mining	146	67(24.3%)	79(24.1%)
Non-Mining	427	246(75.7%)	211(75.9%)
Total	603	325(%)	278(%)
x^2 = 0.000, df = 1, p > .05,			
Panel D: Mining/Non-Mining and Family/Non-Mining			
Mining			
Family Business	19	6(9.1%)	13(16.5%)
Non-Family Business	126	60(90.9%)	66(83.5%)
Total	145	66(100.0%)	79(100.0%)
x^2 = 1.127, df = 1, p > .05,			
Non-Mining #			
Family Business	108	68(27.9%)	40(19.0%)
Non-Family Business	346	176(72.1%)	170(81.0%)
Total	454	244(100.0%)	210(100.0%)
X^2 = 4.37, df = 1, p < .05,			

* Percentage within group for hot markets, 68.5% family and 51.3% non-family (Total Sample)

Percentage within group for hot markets, 62.96% family and 50.9% non-family (Split Sample – Mining/Non-Mining)

Results of Chi-Square test (conducted with continuity correction) demonstrate a significant difference between type of business (family/non-family) with hot/cold cycles (χ^2 = 5.81, *df* = 1, $p <. 05$) and a significant difference between family and non-family firms within the non-mining group documents (χ^2 = 4.37, *df* = 1, $p < .01$). However, within the mining group, there is no significant differences between type of business (family/non-family) and market cycles (χ^2 = 1.127, *df* = 1, $p > .05$, and similarly there are no differences between the mining and non-mining groups (χ^2 = 0.000, *df* = 1, $p > .05$).

6.3.2 Financial Characteristics Year –1 to Year +2

Tables 6.19 to 6.22 show descriptive data which were used to calculate the dependent variables ***JKROA, JKCFOA, STROA*** and ***STCFOA*** (operating performance measures) for Section 3 of the study. A cursory observation of the data reveals that in all cases the means of the financial characteristics are appreciably lower for family business IPOs in contrast to non-family business IPOs.

For example, differences in total assets between family and non-family firms, and between family and non-family firms within the non-mining group, were not only sizeable but also statistically significant in Years –1, 0 and +1 (t = -2.211, $p < .05$, t = -2.202, $p < .05$ and t = -2.424, $p < .05$ for all firms , and t = -2.147, $p < .05$, t = -2.137, $p < .05$ t = -2.381, $p < .05$ for non-mining firms). Similar differences were also noted for the mean values of total liabilities in Years –1, 0 and +1 (t = -2.160, $p < .05$, t = -2.204, $p < .05$ and t = -2.064, $p <$ .05 for all firms, and t = -2.107, $p < .05$, t = -2.150, $p < .05$ t = -2.028, $p < .05$ for non-mining firms). Other significant differences between family and non-family firms were found for tax expense for Year -1 (t = -2.052, $p < .05$, for all firms , and t = -1.978, $p < .05$, for non-mining firms), for interest expense in Years -1 and 0 (t = -2.361, $p < .05$, t = -2.757 for all firms , and t = -2.209, $p < .05$, t = -2.262, $p < .05$ for non-mining firms), for net operating profit in Year 0 (t = -2.068, $p < .05$, for all firms , and t = -1.988, $p <$ for non-mining firms), and for capital expenditure cash flows in Year +1 (t = -2.585, $p < .05$, for all firms , and t = -2.389, $p < .05$ for non-mining firms).

Table 6.19: Financial Characteristics Year –1*

Attribute(s)	Group (Total Sample)	Family and Non-Family				Mining				Non-Mining			
		Family	Non-Family	*t*-stat	*p* value	Family	Non-Family	*t*-stat	*p* value	Family	Non-Family	*t*-stat	*p* value
Total Liabilities ($m)													
Mean	1,070.00	36.82	1,390.00	-	**0.032**	8.77	241.00	-	0.570	43.13	1,610.00	-	**0.037**
Median	10.63	6.50	12.50	2.160		0.32	0.78	0.573		9.53	17.71	2.107	
Total Assets ($m)													
Mean	1,270.00	51.06	1,650.00	-	**0.028**	9.69	332.00	-	0.563	60.37	1,890.00	-	**0.034**
Median	164.45	12.74	18.29	2.211		0.74	2.90	0.585		15.81	23.98	2.147	
Tax expense ($m)													
Mean	14.56	0.98	19.07	-	**0.042**	0.07	4.58	-	0.432	1.16	21.71	-	**0.050**
Median	0.00	0.05	0.00	2.052		0.00	0.00	0.795		0.24	0.01	1.978	
Cash outflows for capital expenditures ($m)													
Mean	30.27	1.91	38.66	-	0.468	0.40	10.89	-	0.578	2.24	43.96	-	0.492
Median	0.21	0.19	0.23	0.727		0.01	0.00	0.563		0.23	0.33	0.688	
Cash flows from operations ($m)													
Mean	49.20	2.65	62.78	-	0.332	-0.64	29.40	-	0.567	3,38	69.36	-	0.372
Median	0.02	0.00	0.08	0.972		-0.09	-0.00	0.578		0.09	0.29	0.894	
Depreciation ($m)													
Mean0	14.68	1.60	19.14	-	0.488	0.11	0.08	-	0.576	1,87	21.20	-	0.516
Median	0.20	0.11	0.30	0.695		0.00	0.00	0.565		0.14	0.36	0.651	
Interest expenses ($m)													
Mean	15.29	1.89	19.87	-	**0.019**	0.11	9.77	-	0.588	2,22	21.75	-	**0.029**
Median	0.10	0.10	0.11	2.361		0.00	0.00	0.547		0.17	0.20	2.209	
Net operating profit ($m)													
Mean	33.17	1.92	43.74	-	0.359	-0.32	8.84	-	0.551	2.37	49.93	-	0.378
Median	0.50	0.41	0.52	0.919		-0.07	-0.06	0.603		1.07	0.93	0.884	

*1st financial period prior to year of listing for those companies existing as corporate entities prior to listing

Table 6.20: Financial Characteristics Year 0*

Attribute(s)	Group (Total Sample)	Family and Non-Family				Mining				Non-Mining			
		Family	Non-Family	*t*-stat	*p* value	Family	Non-Family	*t*-stat	*p* value	Family	Non-Family	*t*-stat	*p* value
Total Liabilities ($m)													
Mean	561.00	23.59	726.00	-2.204	**0.028**	8.77	241.00	-0.531	0.596	43.13	1,610.00	-2.150	**0.032**
Median	5.62	5.71	5.63			0.32	0.78			9.53	17.71		
Total Assets ($m)													
Mean	667.00	53.71	854.00	-2.202	**0.028**	9.69	332.00	-0.562	0.575	60.37	1,890.00	-2.137	**0.033**
Median	16.86	16.35	17.57			0.74	2.90			15.81	23.98		
Tax expense ($m)													
Mean	7.82	1.28	9.82	-1.939	0.053	0.07	4.58	-0.679	0.499	1.16	21.71	-1.050	0.295
Median	0.02	0.10	0.00			0.00	0.00			0.24	0.01		
Cash outflows for capital expenditures ($m)													
Mean	19.18	1.82	24.33	-1.056	0.292	0.40	10.89	-0.568	0.571	2.24	43.96	-1.047	0.296
Median	0.30	0.34	0.27			0.01	0.00			0.23	0.33		
Cash flows from operations ($m)													
Mean	25.20	2.32	31.99	-0.958	0.339	-0.64	29.40	-0.470	0.639	3.38	69.36	-0.944	0.346
Median	0.00	0.00	0.00			-0.09	-0.00			0.09	0.29		
Depreciation ($m)													
Mean	9.35	0.61	11.98	-0.956	0.339	0.12	8.08	-0.624	0.534	1.87	21.20	-0.938	0.349
Median	0.16	0.16	0.16			0.00	0.00			0.14	0.36		
Interest expenses ($m)													
Mean	9.77	1.23	12.31	-2.757	**0.006**	0.11	9.77	-0.465	0.643	2.22	21.75	-2.662	**0.008**
Median	0.06	0.09	0.04			0.00	0.00			0.17	0.20		
Net operating profit ($m)													
Mean	14.86	1.27	18.92	-2.068	**0.039**	-0.32	8.84	-0.581	0.563	2.37	49.93	-1.988	**0.048**
Median	0.31	0.34	0.28			-0.07	-0.06			1,07	0.93		

*Financial period ending in the year of listing

Table 6.21: Financial characteristics Year +1*

Attribute(s)	Group (Total Sample)	Family and Non-Family				Mining				Non-Mining			
		Family	Non-Family	*t*-stat	*p* value	Family	Non-Family	*t*-stat	*p* value	Family	Non-Family	*t*-stat	*p* value
Total Liabilities ($m)													
Mean	593.00	32.82	749.00	-2.064	**0.040**	3.13	72.23	-0.456	0.649	38.58	975.00	-2.028	**0.043**
Median	7.89	8,190	7.80			0.42	0.34			12,59	14.06		
Total Assets ($m)													
Mean	837.00	73.89	1,050.00	-2.424	**0.016**	10.52	121.00	-0.535	0.594	86.18	1,360.00	-2.381	**0.018**
Median	24.44	23,52	24.90			8.79	7,06			28.46	36.43		
Tax expense ($m)													
Mean	11.03	2.53	13.75	-1.102	0.271	0.77	8.07	-0.496	0.623	2.60	14.37	-1.078	0.282
Median	1.06	0.67	1.10			-0.02	0.86			0.69	1.10		
Cash outflows for capital expenditures ($m)													
Mean	26.88	3.91	33.13	-2.585	**0.010**	0.49	11.87	-0.686	0.494	4.51	40.44	-2.398	**0.017**
Media	1.00	1.33	0.91			0.12	0.22			1,67	1.50		
Cash flows from operations ($m)													
Mean													
Median	26.65	2.28	33.32	-1.062	0.289	-0.23	11.43	-0.527	0.599	2.77	40.86	-1.045	0.297
	-0.04	-0.12	-0.03			-0.54	-0.35			0.12	0.72		
Depreciation ($m)													
Mean	9.29	1.09	11.67	-0.991	0.322	0.11	3.31	-0.575	0.566	1.28	14.52	-0.988	0.324
Median	0.36	0.32	0.37			0.02	0.03			0.41	0.66		
Interest expenses ($m)													
Mean	24.58	1.50	31.31	-0.903	0.367	0.02	3.88	-0.409	0.684	1.66	37.32	-0.942	0.347
Median	0.24	0.26	0.23			0.00	0.01			0.35	0.32		
Net operating profit ($m)													
Mean	12.16	2.83	14.77	-0.861	0.390	-0.88	2.75	-0.647	0.519	3.55	18.77	-0.879	0.380
Median	0.46	0.35	0.59			-0.33	-0.53			0.79	1.90		

*1st Financial period ending after the year of listing

Table 6.22: Financial Characteristics Year +2*

Attribute(s)	Group (Total Sample)	Family and Non-Family				Mining				Non-Mining			
		Family	Non-Family	*t*-stat	*P* value	Family	Non-Family	*t*-stat	*p* value	Family	Non-Family	*t*-stat	*p* value
Total Liability ($m)													
Mean	508.00	50.28	615.00	-1.043	0.298	3.35	90.97	-0.509	0.612	62.70	808.00	-1.057	0.291
Median	11.13	11.25	10.64			0.29	0.60			16.77	21.40		
Total Assets ($m)													
Mean	642.00	109.00	766.00	-1.089	0.277	23.00	148.00	-0.526	0.600	132.00	996.00	-1.099	0.272
Median	32.37	27.65	33.89			7.64	7.43			40.67	49.41		
Tax expense ($m)													
Mean	8.41	2.05	9.91	-0 751	0.453	0.31	2.12	-0.504	0.615	2.51	12.77	-0.754	0.452
Median	0.04	0.06	0.04			000	0.00			0.22	0.53		
Cash outflows for capital expenditures ($m)													
Mean	23.91	4.06	28.50	-1.044	0.297	0.38	14.33	-0.797	0.427	4.98	33.74	-0.960	0.338
Median	0.87	0.53	0.89			0.03	0.16			1.07	1.21		
Cash flows from operations ($m)													
Mean													
Median	33.16	5.49	39.60	-0.841	0.401	0.59	13.85	-0.483	0.630	6.72	49.14	-0.815	0.415
	0.21	0.16	0.26			-0.38	-0.41			0.85	1.33		
Depreciation ($m)													
Mean	10.41	1.62	12.44	-0.816	0.415	0.18	4.61	-0.648	0.518	1.98	15.31	-0.780	0.436
Median	0.43	0.46	0.40			0.03	0.04			0.68	0.68		
Interest expenses ($m)													
Mean	22.15	1.72	26.84	-0.891	0.373	0.05	2.92	-0.562	0.575	2.14	35.64	-0.916	0.360
Median	0.21	0.26	0.20			0.00	0.00			0.63	0.43		
Net operating profit ($m)													
Mean	18.59	3.81	22.05	-0.905	0.366	-0.89	2.33	-0.485	0.629	5.05	29.27	-0.926	0.355
Median	0.68	0.73	0.66			-0.96	-0.54			1.29	1.74		

* 2nd financial period ending after the year of listing

6.4 Summary and Conclusions

The descriptive results in this chapter suggest that there are considerable differences among some of the firm attributes for family and non-family firms, albeit from an 'absolute' perspective. Indeed many of the financial attributes are considerably smaller for family firms than for non-family firms, including issue price, issue size, assets, liabilities, sales, and operating performance indicators. Moreover, there were more non-family than family firms that listed during the entire observation period and again for each respective year, and more non-family firms listed after the introduction of the Corporations Law than family firms.

It would also appear that the level of underpricing for family firms was higher than for non-family firms, although family firms in the non-mining group had considerably less underpricing than non-family firms in the same group. Family firms were also younger on average than non-family firms, had less debt and higher fractional interest. These observations will be tested empirically on the dependent variables, firm value, underpricing, and four operation performance variables in Chapter 7 and 8.

Chapter 7: Results – Initial Price Performance & Firm Value

7.1 Introduction

The purpose of this chapter is twofold, to provide and explain the results of

1. Independent *t–tests* of initial underpricing, and
2. Univariate and multivariate regression results for firm value and initial underpricing (as dependent variables), with selected independent variables controlling for family and non-family firms and for industry effects (i.e. mining and non-mining firms).

Specifically, this chapter presents the findings from testing the formal hypotheses 1 to 11 developed in Chapter 4.

7.2 Initial Underpricing – All Observations (1988 – 1999)

The results of testing the following hypotheses are provided in this section;

H_1: Australian IPOs are underpriced

Table 7.1 shows that the mean market adjusted underpricing is 32.16% for all observations under review, which is higher than the results of several other Australian studies including How, (1990, 20.87%), Finn and Higham, (1988, 29.2%) and Steen, (1997, 23.53%). Table 7.1 further shows that raw (unadjusted) underpricing for all observations was 31.99%. These results are consistent with Hypothesis 1, that Australian IPOs are underpriced. The results also show that adjustments for market movements do not significantly alter the level of underpricing.

Table 7.1: Raw and Market Adjusted Initial Underpricing – All Observations

Variable	No. of Observations	Mean	Median	Std. Dev.	Min	Max
Raw Unadjusted Underpricing (UP1)	547	.3199	.008	1.16	-.95	13.00
Market Adjusted Underpricing (UP 2)	547	.3216	.008	1.16	-1.01	13.18

7.2.1 Daily and Cumulative Returns – All Observations

Using the approach undertaken by Chalk and Peavey (1986) to calculate cumulative returns, Table 7.2 shows that most of the excess returns are generated principally on the first day of trading after listing and subsequently followed by insignificant movements within the next 20 days of trading. This finding is consistent with a market that is informationally efficient and is supported in the IPO literature, particularly Ibbotson (1975), Tinic (1988), Barry and Jennings (1993) and Steen (1997), although Steen shows most returns were generated in the first few days after listing.

Table 7.2: Daily and Cumulative Average Returns: First 20 Days of Trading

Day	Ave Daily Return	Cumulative Avg Daily Returns
UP2	0.321	0.321
Chg 1	0.002	0.323
Chg 2	-0.005	0.318
Chg 3	0.002	0.320
Chg 4	0.000	0.320
Chg 5	0.001	0.321
Chg 6	0.002	0.323
Chg 7	-0.003	0.320
Chg 8	0.000	0.320
Chg 9	0.000	0.320
Chg 10	0.002	0.322
Chg 11	-0.001	0.321
Chg 12	0.001	0.322
Chg 13	-0.002	0.320
Chg 14	0.001	0.321
Chg 15	-0.001	0.320
Chg 16	-0.003	0.317
Chg 17	0.003	0.320
Chg 18	-0.002	0.318
Chg 19	0.004	0.322
Std Dev	0.071	

It is also interesting to note that the variability in daily returns for the 547 observations (i.e., as measured by the standard deviation of returns for a 20-day period) is around 7%, which is consistent with similar findings in the literature (Steen, 1997; Ibbotson, 1975; Chalk & Peavey, 1986).

7.2.2 Control for Industry Effects

Consistent with the methodology outlined in Chapter 5, observations were segregated into mining and non-mining companies to control for industry effects on the level of underpricing, particularly given the significant role of resource based industries in

Australian capital markets. Table 7.3 shows the level of underpricing for both, mining and non-mining IPOs. The results demonstrate that mining companies are more underpriced than non-mining industrials, though not significantly: Raw Unadjusted Underpricing (UP1) 35.18% and Market Adjusted Underpricing (UP2) 35.06% for mining companies, compared with UP1 30.91% and UP2 31.17% for non-mining industrials. These findings are consistent with other notable Australian studies which document higher levels of initial underpricing for mining companies (Woo & Suchard, 1993; How, 1994).

Table 7.3: Raw and Market Adjusted Underpricing – Mining and Non-Mining Companies

Variable & Grouping	No. of Observations	Mean	Median	Standard deviation	Min	Max	*t*	*df*	Sig 2-tail
UP1									
Mining	139	.3518	-.01	1.78	-.60	13.0			
Non-Mining	408	.3091	.10	.85	-.95	7.00			
*t-tests**							-0.273	545	0.785
UP2									
Mining	139	.3506	-.01	1.77	-.06	13.18			
Non-Mining	408	.3117	.10	.86	-1.0	7.0			
*t-tests**							0.446	148	0.656

* Since Levene's test has a probability of < .05, equality of variances is not assumed

7.2.3 Daily and Cumulative Returns – Mining and Non-Mining

As with cumulative returns for all observations, Table 7.4 shows that most of the returns within the mining and non-mining groups were generated within the first day of trading followed by insignificant movements in subsequent periods for up to 20 days. Given that a market which is informationally efficient should not yield abnormal returns, these results are also consistent with classical theory of market efficiency (Fama, 1965). Furthermore, the variability of daily share returns is not considerably different between groups; i.e., all observations 7%, mining, 7.8%, and non-mining, 6.9%, although mining has the greatest volatility.

Table 7.4: Daily and Cumulative Returns for Mining and Non-Mining Companies

Day	Mining (n= 104)		Non-Mining (n=341)		*t*–tests
	Ave Daily Return	Cumulative Ave Daily Returns	Ave Daily Return	Cumulative Ave Daily Returns	
UP2	0.311	0.311	0.350	0.350	
Chg 1	0.005	0.316	-0.006	0.344	1.690
Chg 2	-0.005	0.311	-0.005	0.339	-0.020
Chg 3	0.003	0.314	-0.001	0.338	0.916
Chg 4	0.001	0.315	0.000	0.338	0.177
Chg 5	0.001	0.316	0.001	0.339	0.019
Chg 6	0.002	0.318	0.000	0.339	0.306
Chg 7	-0.003	0.315	0.001	0.340	-0.923
Chg 8	-0.001	0.314	0.005	0.345	-1.211
Chg 9	0.001	0.315	-0.003	0.342	0.740
Chg 10	0.005	0.320	-0.004	0.338	1.808
Chg 11	-0.001	0.319	-0.001	0.337	0.049
Chg 12	0.001	0.320	0.000	0.337	0.294
Chg 13	0.001	0.321	-0.003	0.334	0.883
Chg 14	-0.001	0.320	0.007	0.341	-1.459
Chg 15	-0.001	0.319	-0.003	0.338	0.467
Chg 16	-0.003	0.316	-0.001	0.337	-0.627
Chg 17	0.003	0.319	0.003	0.340	0.193
Chg 18	-0.002	0.317	-0.001	0.339	-0.266
Chg 19	0.002	0.319	0.009	0.348	-1.510
Std Dev	**0.069**		**0.078**		

7.3 Initial Underpricing by Family and Non-Family IPOs

The results of testing the following hypothesis are provided in this section;

> *H_2: The level of initial underpricing is higher for family business IPOs than for non-family business IPOs*

Table 7.5 (Part A) shows that the mean value of market adjusted initial underpricing (UP2) for family controlled IPOs was 34.89% compared with 31.65% for non-family controlled IPOs. Moreover, the mean value of unadjusted initial underpricing (UP1) for family business IPOs was 34.67% compared with 31.49% for non-family business IPOs. These findings show that family controlled IPO firms are more underpriced than non-family controlled firms, which is consistent with Hypothesis 2; however the results of independent t-tests show that the differences between family and non-family firms are not statistically significant.

Table 7.5: Raw and Market Adjusted Underpricing –Family and Non-Family IPOs Controlling for Industry Effects

Variable & Grouping	No. of Observations	Mean	Median	Standard deviation	Min	Max	t (Z)	df	Sig 2-tail *(p value)*
Panel A – Family and Non-Family									
UP1									
Family	115	.3467	.10	1.426	-.95	13.00			
Non-Family	429	.3149	.07	1.08	-.92	12.5			
*t-tests**							.223	151	.824
MWU Z							-.890		.379
UP2									
Family	112	.3489	.10	1.44	-1.01	13.18			
Non-Family	401	.3165	.07	1.07	-.92	12.2			
*t-tests**							.401	143	.689
MWU Z							-.987		.324
Panel B – Mining and Non-Mining									
UP1									
Mining									
Family	18	1.383	.13	3.38					
Non-Family	123	.2037	-.02	1.36					
t-tests*							-1.46	17.8	.161
MWU Z							-2.126	-	.033
Non-Mining									
Family	97	.154	.10	.39	-1.0	2.0			
Non-Family	306	.358	.10	.95	-1.0	7.0			
*t-tests**							3.04	375	.003
MWU Z							-.706	-	.480
UP2									
Mining									
Family	18	1.391	.13	3.41					
Non-Family	123	.201	-.03	1.34					
*t-tests**							-1.46	17.8	.161
MWU Z							-2.098		.036
Non-Mining									
Family	97	155	.10	.40	-1.0				
Non-Family	306	.361	.10	.95	-1.0				
*t –tests**							3.05	375	.002
MWU Z							.559		.576

* Since Levene's test has a probability of < .05, equality of variances is not assumed

To further understand these results in the context of Australian capital markets, it was necessary to control for industry effects. As discussed in Chapter 3, Ritter (1984a) observed industry effects on the level of underpricing in the US, whereas several Australian studies (e.g., Woo & Sutchard, 1993) report higher levels of underpricing for resource-based IPOs

After controlling for industry effects, the analysis revealed significant differences between family and non-family IPO firms. Table 7.5 (Part B) shows that both UP1 and UP2 are considerably lower for non-mining family controlled firms, compared with non-mining non-family controlled firms. For example, the mean values for the non-mining group are 15.43% (UP1) and 15.54% (UP2) for family firms, compared with 35.81% and 36.12% for non-family firms. Moreover, the level of underpricing for non-family firms in the non-mining group is more than twice the level of family firms. In addition, independent *t-tests* for both raw and market adjusted initial underpricing ($t = 3.04$, $df = 375$, $p < .01$ and $t = 3.05$, $df = 375$, $p < .01$ respectively) show significant differences for family and non-family IPO firms within the non-mining group. *Mann-Whitney U tests* also show similar significant differences between the two groups ($Z = -2.126$, $p < .05$ for UP1 and $Z = -2.098$, $p < .05$).

In the non-mining context, the results, using non parametric statistical testing, **do not provide support** for Hypothesis 2, that *family firms are more underpriced than non-family firms.*

The results in Table 7.5 also show that the level of underpricing within the mining group is considerably different in absolute terms between family and non-family firms. For example, the results for UP1 and UP2 are 20.37% and 20.13% for non-family firms, compared with 138.39% and 139.16% for family firms. These results indicate that the level of underpricing for family firms within the mining group is almost seven-times higher than non-family firms. Moreover, while independent *t-test* results do not show statistical significance ($t = -1.46$ $df = 17$, $p > .05$ and $t = -1.46$, $df = 17$, $p > .05$), non-parametric *Mann-Whitney U* tests show differences between family and non-family companies for both UP1 and UP2 ($Z = 2.126$, $p < .05$ and $Z = -2.78$, $p < .05$).

7.3.1 Daily and Cumulative Returns – Family and Non-Family Firms

Table 7.6 demonstrates that most of the returns generated within the family and non-family groups were created within the first day of trading followed by insignificant movements in subsequent periods for up to 20 days. As previously indicated, there are no abnormal returns generated on average in a market that is informationally efficient, thus the results in Table 7.6 are consistent with the efficient market hypothesis. The results also show that the variability of returns as measured by the standard deviation of movements in the average daily returns is not considerably different between groups; i.e., family (7.8%) and non-family (7.1%), although family firms are more volatile than non-family firms. However, statistically significant differences were observed between family and non-family IPOs on days 5 and 18, suggesting greater volatility experienced by family firms (-0.008 and 0.005), compared with non-family firms (0.003 and –0.003).

Table 7.6: Daily and Cumulative Returns – Family and Non-Family Firms

Day	Family (n= 123)		Non-Family (n=454)		*t–tests*
	Ave Daily Return	Cumulative Ave Daily Returns	Ave Daily Return	Cumulative Ave Daily Returns	
UP2	0.349	0.349	0.316	0.316	
Chg 1	-0.001	0.348	0.003	0.319	-0.578
Chg 2	-0.003	0.345	-0.006	0.313	0.475
Chg 3	0.005	0.350	0.001	0.314	0.727
Chg 4	-0.001	0.349	0.001	0.315	-0.387
Chg 5	-0.008	0.341	0.003	0.318	-2.338**
Chg 6	-0.001	0.340	0.003	0.321	-0.802
Chg 7	0.000	0.340	-0.003	0.318	0.639
Chg 8	-0.003	0.337	0.001	0.319	0.979
Chg 9	0.000	0.337	0.000	0.319	0.167
Chg 10	0.001	0.338	0.003	0.322	-0.664
Chg 11	0.002	0.340	-0.001	0.321	0.906
Chg 12	0.001	0.341	0.001	0.322	0.046
Chg 13	0.005	0.346	-0.002	0.320	1.900
Chg 14	0.004	0.350	0.000	0.320	0.670
Chg 15	-0.002	0.348	-0.001	0.319	-0.466
Chg 16	-0.009	0.339	-0.002	0.317	-1.348
Chg 17	0.000	0.339	0.004	0.321	-1.038

Chg 18	0.005	0.344	-0.003	0.318	**1.999***
Chg 19	-0.002	0.342	0.005	0.323	-1.765
Std Dev	**0.078**		**0.071**		

* $p < .05$; ** $p < .01$

7.3.2 Daily and Cumulative Returns – Family and Non-Family Firms Controlling for Industry Effects

As in the previous example, Table 7.7 (Panels A and B) also shows that most of the returns generated within the mining and non-mining groups were created within the first day of trading. Moreover, these results do not provide evidence of abnormal returns being generated, suggesting consistency with a market that is informationally efficient. Also the variability of returns is not considerably different between groups; i.e., all observations (7%), mining (7.8%) and non-mining (6.9%), although mining has the greatest volatilit.

Most of the initial returns for both family and non-family business IPOs were generated on the first day of trading followed by insignificant movements in subsequent periods for up to 20 days. It is interesting to note however, that there are significant differences in the variability of returns between family and non-family firms in the non-mining group; i.e. 3.5% for family firms compared with 8.1% for non-family firms.

Table 7.7: Daily and Cumulative Returns – Family and Non-Family Firms Controlling for Industry Effects

Panel A – Non-Mining

Day	Family (n= 104)		Non-Family (n=341)		*t*–*tests*
	Ave Daily Return	Cumulative Ave Daily Returns	Ave Daily Return	Cumulative Ave Daily Returns	
UP2	0.155	0.155	0.361	0.361	
Chg 1	0.004	0.159	0.006	0.367	-0.213
Chg 2	-0.003	0.156	-0.006	0.361	0.547
Chg 3	0.005	0.161	0.002	0.363	0.407
Chg 4	-0.005	0.156	0.002	0.365	-1.390
Chg 5	-0.006	0.150	0.003	0.368	-1.716
Chg 6	0.002	0.152	0.002	0.370	-0.031
Chg 7	0.000	0.152	-0.005	0.365	1.038

Chg 8	-0.006	0.146	0.003	0.368	-1.245
Chg 9	0.002	0.148	0.000	0.368	0.345
Chg 10	0.000	0.148	0.006	0.374	-1.420
Chg 11	0.001	0.149	-0.001	0.373	0.476
Chg 12	0.002	0.151	0.000	0.373	0.201
Chg 13	0.005	0.156	-0.001	0.372	1.280
Chg 14	0.003	0.159	-0.002	0.370	0.932
Chg 15	-0.002	0.157	0.000	0.370	-0.324
Chg 16	-0.008	0.149	-0.003	0.367	-0.930
Chg 17	0.000	0.149	0.004	0.371	-1.092
Chg 18	0.006	0.155	-0.005	0.366	**2.166****
Chg 19	-0.003	0.152	0.003	0.369	-1.736
Std Dev	**0.035**		**0.081**		

* $p < .05$

Panel B – Mining

Day	Family (n= 104)		Non-Family (n=341)		*t*–tests
	Ave Daily Return	**Cumulative Ave Daily Returns**	**Ave Daily Return**	**Cumulative Ave Daily Returns**	
UP2	1.390	1.390	0.201	0.201	
Chg 1	-0.027	1.363	-0.003	0.198	-1.554
Chg 2	-0.007	1.356	-0.005	0.193	-0.090
Chg 3	0.007	1.363	-0.003	0.190	0.641
Chg 4	0.020	1.383	-0.003	0.187	1.721
Chg 5	-0.020	1.363	0.003	0.190	-1.834
Chg 6	-0.018	1.345	0.004	0.194	-1.714
Chg 7	-0.002	1.343	0.001	0.195	-0.238
Chg 8	0.011	1.354	0.004	0.199	0.603
Chg 9	-0.008	1.346	-0.002	0.197	-0.670
Chg 10	0.005	1.351	-0.006	0.191	1.678
Chg 11	0.009	1.360	-0.003	0.188	1.328
Chg 12	-0.004	1.356	0.000	0.188	-0.533
Chg 13	0.011	1.367	-0.006	0.182	1.484
Chg 14	0.007	1.374	0.007	0.189	-0.022
Chg 15	-0.007	1.367	-0.002	0.187	-0.729
Chg 16	-0.014	1.353	0.000	0.187	-[illegible].521
Chg 17	0.001	1.354	0.003	0.190	-0.130
Chg 18	0.000	1.354	0.000	0.190	0.035
Chg 19	0.007	1.361	0.010	0.200	-0.243
Std Dev	**0.310**		**0.045**		

Table 7.7 (Panel B) also shows that most returns for both family and non-family firms within the mining group were generated on the first day of trading followed by insignificant movements in subsequent periods. Moreover, there are differences in the variability of returns for family firms (3.1%) and non-family firms (4.5%) within the mining group, indicating that the returns of family firms are less volatile.

7.4 Firm Value, Initial Underpricing and Firm Characteristics

This section examines factors known to influence the level of underpricing and firm value, including such factors as the level of share ownership by existing founders/shareholders, firm size, firm age, firm risk, reputation of auditors and underwriters, market cycles, changes to legislation, and the existence of profit forecasts. While conducting data screening, bivariate scatter plots for several combinations of variables (e.g., market adjusted underpricing, firm value, fractional interest) demonstrated forms which suggested heteroscedasticity. As the form of the heteroscedasticity was known for these combinations of variables, weighted-least squares regression analyses were performed between market adjusted underpricing and firm value as the dependent variables and a selection of independent variables described above including family business and non-mining firms. The hypothesized models were examined using both asymptotic covariance and polychoric correlation matrices, which were subsequently used to produce weight matrices for the weighted least squares estimation procedures. In addition, the matrices were computed using listwise deletion of missing data, hence the discrepancies in sample sizes throughout the regression analyses.

Moreover, a second element to the analysis involved the application of univariate regressions together with factorial analysis of variance, to determine whether;

a) specific independent variables are associated with firm value and market adjusted underpricing,
b) whether this association is moderated by firm type, that is, family control,
c) which combination (and interaction effects) of firm characteristics provides an explanation of market adjusted underpricing, and
d) whether this group of firm characteristics is also moderated by firm type, that is, family control.

In addition, for reasons explained earlier, it was necessary to control for industry effects on the level of market adjusted underpricing.

7.4.1 Ownership Retention (Fractional Interest), Market Adjusted Underpricing and Firm Value

7.4.1.1 Firm Value and Fractional Interest

The results of testing the following hypotheses are provided in this section;

> $H_{3(a)}$: *Firm value is positively associated with fractional interest.*
>
> $H_{3(b)}$: *The positive association between firm value and fractional interest is moderated by family control.*

Leland and Pyle (1977), Downes and Heinkel (1982), Clarkson *et al.* (1991), How and Low (1993) and Steen (1997), provided evidence that higher levels of equity retention by owners-entrepreneurs sends positive signals to the market regarding greater stability and less uncertainty, resulting in higher firm value. Similar findings were reported by Ritter (1984) and McBain and Krause (1989) using an agency theoretic perspective, since firms with higher levels of equity retention by owners-entrepreneurs would be less likely to engage in managerial shirking resulting in lower agency costs and a higher firm value. Given these themes therefore, we would expect to find a positive association between ownership retention and firm value, and since family firms have relatively higher level of equity retention than non-family firms (see Chapter 6), we would also expect that the positive association between ownership retention and firm value will be moderated by family control.

Regression Results – Table 7.8 shows the results of the weighted least squares analysis for firm value as the dependent variable and fractional interest (ownership retention) and mining as independent variables. The results demonstrate that each independent variable is significantly associated ($t = 5.59$, $p < .05$ and $t = -9.47$, $p < .05$, respectively) with firm value, and that the model accounts for 10.3% of the variance. Indeed, the omnibus test ($F = 14.01$, $df = 2, 247$, $p < .01$) indicates that the WLS model is robust in predicting firm value. Moreover, the positive association between firm value and fractional interest is consistent with the predicted direction. These findings are consistent with the principal findings in the literature and thus $H_{3(a)}$: that *firm value is positively associated with fractional interest* is **supported in this study.**

Table 7.8: Weighted Least Squares Regression – Fractional Interest and Mining on Firm Value

	Firm Value*#			
Independent Variables	χ (Gamma)	SE	t-value	Sig.
Fractional Ownership	0.118	0.021	5.59	-
Mining	-0.273	0.029	-9.47	-
WLS Regression Model	**Adjusted R^2**	**F-Value**	**Sig.**	
	0.103	14.01	$P < .05$ (df=2, 247)	

*# Total number of shares by market price on day 20 after issue

A factorial ANOVA was employed to determine if the addition of information regarding family and non-family controlled IPOs (FB_NFB) moderated prediction of firm value additional to differences attributable to fractional interest using the WLS model. The results in Table 7.9 show that the interacting effects of fractional interest with family firms and mining on firm value are statistically significant (Adjusted R^2 = .051, F [4,247] = 4.31, p < .05). Moreover, the interacting effects between specific independent variables and fractional interest are significant for family and non-mining firms (t = 2.262, p < .05), and the *effect size* using Cohens (1988) scale is small (Eta^2 = .021). Additionally, the positive sign of the unstandardised beta coefficient (B) is consistent with the predicted sign. Similarly, the interacting effects of non-family and non-mining firms are statistically significant (t = 2.305, p < .05) but with a small effect size (Eta^2 = .021) and a positive sign. Indeed, Table 7.9 also shows, in addition to the interacting effects of family and non-family firms (with non-mining) on firm value, the extent of these interacting effects on the mean values of firm value. For instance, the mean value of firm value with fractional interest and mining is $79, 664, 281 for non-mining firms, whereas with FB_NFB added, the mean values for the non-mining firms are $83,856,535 for family firms and $115,000,000 for non-family firms respectively. These results show that firm value is appreciably higher when FB_NFB is added to the factorial model, thus suggesting that the existence of family firms has had a moderating effect on the results. Indeed, this is consistent with the themes adopted in the literature since family firms have higher levels of equity retention than non-family firms. Thus, given the above results, Hypothesis $H_{3(b)}$: that "*The positive association between firm value and fractional interest is moderated by family control*", **is supported in this study.**

Table 7.9: Factorial ANOVA – Fractional Interest, Mining and FB_NFB on Firm Value

Parameters & Interacting Effects	Firm Value*#				
	B	SE	Eta Squared	t-value	Sig.
Parameter Estimates					
Fracowne, Mining=0, FB_NFB=0	0.901	0.399	0.021	2.262	0.025*
Fracowne, Mining=0, FB_NFB=1	0.930	0.404	0.021	2.305	0.022*
Fracowne, Mining=1, FB_NFB=0	-0.805	0.834	0.004	-1.019	0.309
Fracowne, Mining=1, FB_NFB=1	-0.990	0.937	0.005	-1.056	0.292
Between Subjects Effects (Model)					
Mining, Fractional Interest & FB_NFB	*(SS)*#	29.15			
	F-Value	4.310	*df* = 4	*Sig.* 0.002**	
	Eta $(R)^2$	0.067			
	Adj. R^2	0.051			
Estimated Marginal Means					
Mining – Non -Mining	**Firm Value Means**				
Mining	107,000,000				
Non-Mining	79,664,281				
Mining and FB_NFB					
Fracowne, Mining = 0, FB_NFB = 0	83,856,535				
Fracowne, Mining = 0, FB_NFB = 1	115,000,000				
Fracowne, Mining = 1, FB_NFB = 0	32,934,699				
Fracowne, Mining = 1 FB_NFB = 1	181,000,000				
Levene's test of equality of error variances:	*F = 0 .952, df1 = 3, df2 = 243, Sig. = 0.416*				

* $p < .05$; ** $p < .01$; *** $p < .001$
# Type III Sum of Squares
*# Total number of shares by market price on day 20 after issue

7.4.1.2 Firm Value and Market Adjusted Underpricing

In line with the signalling hypothesis explained in Chapter 3, that *high value* firms will intentionally use underpricing to signal superior prospects to investors (Allen & Faulhaber, 1989; How & Low, 1993; and Steen 1997), we can expect to find a positive association between firm value and the level of IPO underpricing. Moreover, given that family firms have higher levels of fractional interest than non-family firms we can also expect to find that the positive relationship between firm value and market adjusted underpricing, is moderated by family control. Thus the results of testing the following hypotheses are shown in this section:

> $H_{3(c)}$: *Firm value is positively associated with the level of IPO underpricing.*

> $H_{3(d)}$: *The positive association between firm value and the level of IPO underpricing is moderated by family control.*

The results of the weighted least squares analysis for firm value as the dependent variable and market adjusted underpricing and mining as independent variables are shown in Table 7.10. The results demonstrate that both market adjusted underpricing and mining, are significantly associated with firm value (t = 10.55, $p < .05$ and t = -9.47, $p < .05$, respectively), and that the model accounts for 18.5% of the variance. The omnibus test (F = 44.05, df = 2, 393, $p > .05$) also shows a significant WLS model in predicting firm value. Moreover, the positive association between firm value and market adjusted underpricing is consistent with the predicted sign and the evidence in the literature. Given these results, $H_{3(c)}$: that *firm value is positively associated with the level of IPO underpricing* is **supported in this study.**

Table 7.10: Weighted Least Squares Regression – Market Adjusted Underpricing (UP2) and Mining on Firm Value

Independent Variables	Firm Value*# χ (Gamma)	SE	t-value	Sig.
UP2†	0.304	0.029	10.57	-
Mining	-0.274	0.026	-10.66	-
WLS Regression Model	**Adjusted R²**	***F*-Value**	**Sig.**	
	0.185	44.047	$P < .01$ (df=2, 393)	

† Natural Logarithm
*# Total number of shares by market price on day 20 after issue

Table 7.11 show the results of the factorial ANOVA analysis which indicate that the interacting effects of market adjusted underpricing, family/non-family firms and mining on firm value provide a statistically significant model (Adjusted $R^2 = .107$, $F\,[4,390] = 12.65$, $p < .001$). Further, the interacting effects between specific independent variables and market adjusted underpricing are statistically significant for the following combination of independent variables:

- Family and non-mining firms on market adjusted underpricing ($t = 2.328$, $p < .05$) with a small *effect size* ($Eta^2 = .021$),
- Non-family and non-mining firms on market adjusted underpricing ($t = 5.102$, $p < .001$) with a moderate effect size ($Eta^2 = .063$)
- Non-family and mining firms on market adjusted underpricing ($t = 4.291$, $p < .001$) with a small *effect size* ($Eta^2 = .046$),

Additionally, the positive sign of the unstandardised beta coefficient for all independent variables is consistent with the predicted direction.

Table 7.11: Factorial ANOVA – Market Adjusted Underpricing (UP2), Mining and FB_NFB on Firm Value

Parameters & Interacting Effects	Firm Value*#				
	B	SE	Eta Squared	*t* - value	Sig.
Parameter Estimates					
UP2†*, Mining=0, FB_NFB=0*	0.961	0.413	0.021	2.328	0.020*
UP2†*, Mining=0, FB_NFB=1*	0.914	0.179	0.021	5.102	0.000***
UP2†*, Mining=1, FB_NFB=0*	0.684	0.493	0.004	1.313	0.190
UP2†*, Mining=1, FB_NFB=1*	1.581	0.368	0.005	4.291	0.000***
Between Subjects Effects (Model)					
Mining, UP2† *& FB_NFB*	*(SS)*#	90.56			
	F-Value	12.65	*df* = 4	*Sig.* 0.000***	
	Eta $(R)^2$	0.116			
	Adj. R^2	0.107			
Estimated Means					
Mining – Non -Mining	**Firm Value Means**				
Mining	120,000,000				
Non-Mining	126,000,000				
Mining and FB_NFB					
UP2†*, Mining = 0, FB_NFB = 0*	120,000,000				
UP2†*, Mining = 0, FB_NFB = 1*	118,000,000				
UP2†*, Mining = 1, FB_NFB = 0*	131,000,000				
UP2†*, Mining = 1 FB_NFB = 1*	121,000,000				
Levene's test of equality of error variances:	*F = 2 04, df1 = 3, df2 = 386, Sig. = 0.109*				

* $p < .05$; ** $p < .01$; *** $p < .001$
# Type III Sum of Squares
† Natural Logarithm
*# Total number of shares by market price on day 20 after issue

These results provide evidence in support of signalling theory in the context of IPOs as posited by Allen Faulhaber (1989) and subsequently documented in several studies including Grinblatt and Hwang (1989), How and Low (1993), and Steen 1997. Moreover, the results provide evidence that the existence of firm type (i.e., FB_NFB) has a moderating effect on the positive relation between firm value and market adjusted underpricing. For instance, the mean value of firm value with UP2 and mining, is $120,000,000 whereas with

FB_NFB added, the mean value of firm value increases for both family firms ($131, 000,000) and non-family firms ($121,000,000), suggesting a moderating effect resulting from the addition of family firms. Indeed this is consistent with the themes adopted in this study which posit that family firms are 'high value' firms given higher levels of equity retention and other signals of quality. Given these findings, hypotheses $H_{3(c)}$: that *firm value is positively associated with the level of IPO underpricing,* and $H_{3(d)}$: that *the positive association between firm value and the level of IPO underpricing is moderated by family control* are **supported in this study.**

7.4.1.3 Market Adjusted Underpricing and Fractional Interest

As explained in Chapter three, if theory predicts a positive relationship between firm value and fractional interest and also between firm value and market adjusted underpricing, then there is an implicit positive relationship between fractional interest and market adjusted underpricing. Indeed this link was reported in several studies including, Grinblatt & Hwang, 1989; How, 1990; Affleck-Graves *et al.*, 1993; Lee *et al.*, 1996; and, Steen 1997. Given these findings we would expect similar outcomes in this study. The results of testing the following hypotheses are thus reported in this section:

> $H_{3(e)}$: *The level of IPO underpricing is positively associated with fractional interest.*
>
> $H_{3(f)}$: *The positive association between the level of IPO underpricing and fractional interest is moderated by family control.*

Regression Results – The WLS model in Table 7.12 shows that fractional interest and mining as independent variables, are positively and significantly associated with market adjusted underpricing as the dependent variable (t = 8.417, $p < .05$ and t = 4.998, $p < .05$, respectively). Moreover, while the omnibus test shows that the overall strength of the model in predicting UP2 is statistically significant (F = 3.90, df = 2, 300, $p < .05$), the model only explains 2.5% of the variance in market adjusted underpricing. Notwithstanding however, the results show a positive and significant association between market adjusted underpricing and fractional interest which is consistent with several prior studies as previously explained. Thus, given these findings, hypothesis $H_{3(e)}$: that *the level of IPO underpricing is positively associated with fractional interest* is **supported in this study.**

Table 7.12: Weighted Least Squares Regression – Fractional Interest and Mining on Market Adjusted Underpricing

	Market Adjusted Underpricing (UP2) †			
Independent Variables	**χ (Gamma)**	**SE**	***t*-value**	**Sig.**
Fractional Interest	0.130	0.015	8.47	-
Mining	0.127	0.025	4.996	-
WLS Regression Model	**Adjusted R²**	***F*-Value**	**Sig.**	
	0.025	3.90	$P < .05$ (df=2, 300)	

† Natural Logarithm

The results of factorial ANOVA analysis in Table 7.13 indicate that fractional interest with family/non-family firms and mining on market adjusted underpricing is statistically significant (Adjusted R^2 = .077, F [4,300] = 7.238, $p < .001$). In addition, the interacting effects between specific independent variables and market adjusted underpricing are statistically significant for the following combination of independent variables:

- Non-family with non-mining firms on market adjusted underpricing (t = 1.991, $p < .05$) with a small *effect size* (Eta^2 = .013),
- Family with non-mining firms on market adjusted underpricing (t = 5.273 $p < .001$) with a moderate effect size (Eta^2 = .086)

Moreover, the sign for the unstandardised beta coefficient is positive for all independent variables which is consistent with theory. These findings however, need to be interpreted in the context of the underlying statistical assumptions employed in the factorial ANOVA, including the assumption that variances will be equal. It is observed in Table 7.13, that Levene's test of error variances is significant, i.e., less than .05 (p < 000) which violates the assumption that the variance of the dependent variable is equal across the groups. In these circumstances, Tabachnik and Fidell (1996) suggest that a more conservative alpha level be set for determining the significance of the relevant variable in the univariate F -test, for instance an alpha of .025 or .01, rather than the conventional .05 level. If we set a more stringent alpha of .025 for the purposes of interpreting the results of the factorial ANOVA in Table 7.13, then the only statistically significant result relates to the interaction between fractional interest and family with non-mining firms on market adjusted underpricing (t = 5.273, $p < .001$) with a moderate effect size ($Eta^2 = .086$). Indeed, Table 7.13 also shows that in addition to these interacting effects, the mean value of UP2 with fractional interest is $0.91 for mining firms, whereas with FB_NFB added, the mean value for UP2 for mining firms is $1.49. These results show that UP2 is appreciably higher when FB_NFB is added to the factorial model, thus suggesting that the existence of family firms has had a moderating effect on the results. This is consistent with the themes adopted in this study that high value firms intentionally underprice and since family firms have higher levels of equity retention than non-family firms (and thus higher firm value) we would expect a moderating effect on the relationship between firm fractional interest and UP2. Thus Hypothesis $H_{3(f)}$: that "*The positive association between the level of IPO underpricing and fractional interest is moderated by family control*" is **supported by the findings in this study.**

Table 7.13: Factorial ANOVA – Fractional Interest, Mining and FB_NFB on Market Adjusted Underpricing (UP2)

Parameters & Interacting Effects	**Market Adjusted Underpricing (UP2)** †				
	B	**SE**	**Eta Squared**	***t* - value**	**Sig.**
Parameter Estimates					
Fractional Interest, Mining=0, FB_NFB=0	0.311	0.278	0.004	1.120	0.264
Fractional Interest, Mining=0, FB_NFB=1	0.574	0.288	0.013	1.991	0.047*
Fractional Interest, Mining=1, FB_NFB=0	3.192	0.605	0.086	5.373	0.000***
Fractional Interest, Mining=1, FB_NFB=1	0.838	0.485	0.010	1.728	0.085
Between Subjects Effects (Model)					
Fractional Interest, Mining & FB_NFB	*(SS)* #	28.68			
	F-Value	7.172	*df* = 4	*Sig.* 0.000***	
	Eta $(R)^2$	0.089			
	Adj. R^2	0.077			
Estimated Means					
Mining – Non -Mining	**UP2 Means**				
Mining	0.936				
Non-Mining	0.199				
Mining and FB_NFB					
Fractional Interest, Mining = 0, FB_NFB = 0	0.137				
Fractional Interest, Mining = 0, FB_NFB = 1	1.488				
Fractional Interest, Mining = 1, FB_NFB = 0	0.261				
Fractional Interest, Mining = 1 FB_NFB = 1	0.385				
Levene's test of equality of error variances:	*F = 25.102, df1 = 3, df2 = 296, Sig. =0.000****				

* $p < .05$; ** $p < .01$; *** $p < .001$

\# Type III Sum of Squares

† Natural Logarithm

7.4.2 Firm Age and Market Adjusted Underpricing

The results of testing the following hypothesis are provided in this section;

> $H_{4(a)}$: *Firm age is negatively associated with the level of IPO initial underpricing*
>
> $H_{4(b)}$: *The negative association between firm age and the level of IPO initial underpricing is moderated by family control.*

It was hypothesised in Chapter 4 that older firms provide more positive signals to the market and are thus perceived as being less risky. Indeed several studies examine the relationship between firm age and the level of underpricing and typically find an association between the two variables. For instance, Young and Zaima (1988) found that younger firms exhibit greater levels of underpricing. Australian studies also find similar evidence (e.g. Lee *et al.*, 1994; Steen, 1997). On the basis of the evidence in the literature, it was thus predicted in this study that older firms would have lower underpricing. Moreover, since family businesses in general are known to be older than non-family businesses, and indeed in many cases, they are amongst the oldest firms in the world (e.g., Westhead & Cowling, 1999; Stoy Hayward 1992; Payne, 1984), it was predicted that family firms would be older than non-family firms and would thus have lower levels of underpricing.

Regression Results – Table 7.14 illustrates that firm age and mining as independent variables are negatively associated with market adjusted underpricing using the WLS regression model and therefore consistent with Hypothesis 4(a). However, while these results are statistically significant for mining (t = -5.852, p < .05), the model is not statistically significant, (F = 1.00, df = 2, 500, p > .05). Therefore hypothesis $H_{4(a)}$: that *firm age is negatively associated with the level of IPO initial underpricing* is **not supported in this study.**

Table 7.14: Weighted Least Squares Regression – Firm Age and Mining on Market Adjusted Underpricing

	Market Adjusted Underpricing (UP2)[†]			
Independent Variables	χ **(Gamma)**	**SE**	t **- value**	**Sig.**
Firm Age[†]	-0.024	0.036	-0.667	-
Mining	-0.057	0.010	-5.852	-
WLS Regression Model	**Adjusted R^2**	***F*-Value**	**Sig.**	
	0.004	1.00	$P < .05$ (df=2, 500)	

[†] Natural Logarithm

Table 7.15 provides the results of factorial ANOVA analysis which shows that firm age (with mining and FB_NFB) is also negatively associated with the level of market adjusted underpricing in all cases, except for family firms with mining. However, while the model is statistically significant (Adjusted R^2 = .016, F [4,497] = 3.065, p < .05), the interacting effects between specific independent variables (firm age, mining and FB_NFB) and market adjusted underpricing, are not statistically significant for any of the combinations of independent variables. Thus, hypothesis $H_{4(b)}$: that *the negative association between firm age and the level of IPO initial underpricing is moderated by family control* is **not supported in this study.**

Table 7.15: Factorial ANOVA – Firm Age, Mining and FB_NFB on Market Adjusted Underpricing (UP2)

Parameters & Interacting Effects	**Market Adjusted Underpricing (UP2)**†				
	B	**SE**	**Eta Squared**	***t* - value**	**Sig.**
Parameter Estimates					
Firm Age†*, Mining=0, FB_NFB=0*	-0.008	0.014	0.001	-0.595	0.552
Firm Age†*, Mining=0, FB_NFB=1*	-0.005	0.013	0.000	-0.361	0.718
Firm Age† *t, Mining=1, FB_NFB=0*	0.036	0.020	0.006	1.787	0.075
Firm Age†*, Mining=1, FB_NFB=1*	-0.021	0.015	0.004	-1.471	0.142
Between Subjects Effects (Model)					
Firm Age†*, Mining & FB_NFB*	*(SS)*#	2.691			
	F-Value	3.065	*df* = 4	*Sig.* 0.000***	
	Eta $(R)^2$	0.024			
	Adj. R^2	0.016			
Estimated Means					
Mining – Non -Mining	**Age Means**				
Mining	0.958				
Non-Mining	0.275				
Mining and FB_NFB					
Firm Age†*, Mining = 0, FB_NFB = 0*	0.241				
Firm Age†*, Mining = 0, FB_NFB = 1*	1.680				
Firm Age†*, Mining = 1, FB_NFB = 0*	0.308				
Firm Age†*, Mining = 1 FB_NFB = 1*	0.237				
Levene's test of equality of error variances:	*F = 5.56, df1 = 3, df2 = 493, Sig. =0.001****				

* $p < .05$; ** $p < .01$; *** $p < .001$

\# Type III Sum of Squares

† Natural Logarithm

7.4.3 Underwriter Prestige and Market Adjusted Underpricing

The results of testing the following hypotheses are provided in this section;

> ***$H_{5(a)}$*: *Underwriter prestige is negatively associated with the level of IPO initial underpricing***

> ***$H_{5(b}$* : *The negative association between underwriter prestige and the level of IPO initial underpricing is moderated by family control.***

In Chapters 3 and 4, it was asserted that markets respond favourably to firms that use prestigious underwriters, since their involvement in the listing process provide signals of quality to the market and thus result in less uncertainty and lower underpricing for those firms. These findings are well documented in several studies including Logue (1973), Shapiro (1991), Wolfe *et al.* (1994), Menon and Williams (1991), Titman and Trueman, (1986), Beatty (1989) and How *et al.* (1993). Given these themes, we would expect similar findings in this study.

Regression Results – Table 7.16 shows that underwriter prestige is negatively associated with market adjusted underpricing using WLS regression, which is consistent with the predicted sign. Indeed underwriter reputation and mining as independent variables, are both statistically significant, (t = -3.849, $p < .05$ and t = 4.998, $p < .05$, respectively). However, the overall strength of the WLS model is not significant (F = 2.50, df = 2, 484, $p > .05$), and thus, hypothesis $H_{5(a)}$: that "*Underwriter prestige is negatively associated with the level of IPO initial underpricing*" is **not supported by the findings in this study.**

Table 7.16: Weighted Least Squares Regression – Underwriter Prestige and Mining on Market Adjusted Underpricing

	Market Adjusted Underpricing (UP2) †			
Independent Variables	χ **(Gamma)**	**SE**	**t - value**	**Sig.**
Underwriter Prestige	-0.041	0.011	-3.849	-
Mining	-0.092	0.009	-9.663	-
WLS Regression Model	**Adjusted R^2**	***F*-Value**	**Sig.**	
	0.010	2.50	$P < .05$ (df=2, 484)	

† Natural Logarithm

Similar findings to the above WLS model are also reported in Table 7.17, using factorial ANOVA with FB_NFB added to the model. For example, the results show that while the sign of the coefficients is in the predicted direction (except for non-family firms with mining), none of the independent interacting variables are statistically significant. Moreover, the model is also not statistically significant, Adjusted $R^2 = .003$, $F\,[4,481] = 1.369$, $p > .05$). Thus hypothesis $H_{5(b)}$: that *"The negative association between underwriter prestige and the level of IPO initial underpricing is moderated by family control"* **is not supported by the results of this study.**

Table 7.17: Factorial ANOVA – Underwriter Prestige, Mining and FB_NFB on Market Adjusted Underpricing (UP2)

Parameters & Interacting Effects	Market Adjusted Underpricing (UP2) †				
	B	SE	Eta Squared	*t* - value	Sig.
Parameter Estimates					
Underwriter Ptge, Mining=0, FB_NFB=0	-0.160	0.085	0.007	-1.896	0.059
Underwriter Ptge, Mining=0, FB_NFB=1	-0.025	0.050	0.001	0.498	0.618
Underwriter Ptge, Mining=1, FB_NFB=0	0.025	0.237	0.000	-0.106	0.916
Underwriter Ptge, Mining=1, FB_NFB=1	-0.085	0.078	0.002	-1.087	0.278
Between Subjects Effects (Model)					
Underwriter Ptge, Mining & FB_NFB	*(SS)* #	1.213			
	F-Value	1.369	*df* = 4	*Sig.* 0.244	
	Eta $(R)^2$	0.011			
	Adj. R^2	0.003			
Estimated Means					
Mining – Non -Mining	**UP2 Means**				
Mining	0.210				
Non-Mining	0.263				
Mining and FB_NFB					
Underwriter Ptge, Mining = 0, FB_NFB = 0	0.199				
Underwriter Ptge, Mining = 0, FB_NFB = 1	0.205				
Underwriter Ptge, Mining = 1, FB_NFB = 0	0.328				
Underwriter Ptge, Mining = 1 FB_NFB = 1	0.216				
Levene's test of equality of error variances:	*F = .851, df1 = 3, df2 = 477, Sig. = 0.466*				

* $p < .05$; ** $p < .01$; *** $p < .001$
# Type III Sum of Squares
† Natural Logarithm

7.4.4 Auditor Prestige and Market Adjusted Underpricing

The results of testing the following hypotheses are provided in this section;

> ***$H_{6(a)}$***: *Auditor prestige is negatively associated with the level of IPO initial underpricing*

> ***$H_{6(b)}$***: *The negative association between auditor prestige and the level of IPO initial underpricing is moderated by family control*

Along similar arguments supporting the relationship between underwriter prestige and underpricing, it was asserted in Chapters 3 and 4 that capital markets respond favourably to firms that use prestigious auditors. Their involvement in the listing process provides signals of quality to the market, resulting in less uncertainty and lower underpricing for IPO firms. The expectation in this study is that firms with a prestigious auditor will be less underpriced than those without a prestigious auditor. Moreover, the level of underpricing will be moderated by family control.

Regression Results – Table 7.18 shows that auditor prestige is negatively associated with market adjusted underpricing and therefore consistent with Hypothesis $H_{6(a)}$, however the overall strength of the regression WLS model is not statistically significant (Adjusted R^2 = .003, F [2,509] = .760, $p > .05$). Moreover while the results of independent t-tests for auditor prestige are also not statistically significant (t = -1.644, $p > .05$), the results for mining are significant (t = 5.623, $p < .001$). However, given that the WLS model is not significant in predicting market adjusted underpricing, hypothesis $H_{6(a)}$: that "*Auditor prestige is negatively associated with the level of IPO initial underpricing*" is **not supported in this study.**

Table 7.18: Weighted Least Squares Regression – Auditor Prestige and Mining on Market Adjusted Underpricing

	Market Adjusted Underpricing (UP2) †			
Independent Variables	χ **(Gamma)**	**SE**	t **- value**	**Sig.**
Auditor Prestige	-0.016	0.010	-1.64	-
Mining	-0.053	0.009	-5.623	-
WLS Regression Model	**Adjusted R^2**	***F*-Value**	**Sig.**	
	0.003	0.76	$P < .05$ (df=2, 509)	

† Natural Logarithm

A factorial ANOVA analysis was again applied to determine if the interacting effect of information regarding family and non-family controlled IPOs, moderated prediction of market adjusted underpricing, beyond that afforded by differences in auditor prestige with mining using WLS. The results in Table 7.19 show that auditor prestige is negatively associated with market adjusted underpricing for two combinations of independent variables; audit prestige with family and non-mining, and audit prestige with non-family and mining, however in both cases the results were not statistically significant (t = -.973, $p > .05$ and t = -1.250, $p > .05$). Moreover the factorial ANOVA is also not statistically significant (Adjusted $R^2 = 0.002$, F (1,395 = 1.311, $p >.05$). These findings are not consistent with the underlying theory which support a negative relation between auditor prestige and market adjusted underpricing, and accordingly, hypothesis $H_{6(b)}$: that "*The negative association between auditor prestige and the level of IPO initial underpricing is moderated by family control*" is **not supported in this study**.

Table 7.19: Factorial ANOVA – Auditor Prestige, Mining and FB_NFB, on Market Adjusted Underpricing (UP2)

Parameters & Interacting Effects	Market Adjusted Underpricing (UP2) †				
	B	SE	Eta Squared	t - value	Sig.
Parameter Estimates					
Auditor Ptge, Mining=0, FB_NFB=0	-0.0718	0.074	0.002	-0.973	0.331
Auditor Ptge, Mining=0, FB_NFB=1	0.009	0.051	0.000	0.192	0.848
Auditor Ptge, Mining=1, FB_NFB=0	0.187	0.144	0.003	1.299	0.195
Auditor Ptge, Mining=1, FB_NFB=1	-0.085	0.068	0.003	-1.250	0.212
Between Subjects Effects (Model)					
Auditor Ptge, Mining & FB_NFB	*(SS)* #	1.207			
	F-Value	1.311	*df* = 4	*Sig.* 0.265	
	Eta $(R)^2$	0.010			
	Adj. R^2	0.002			
Estimated Means					
Mining – Non -Mining	**UP2 Means**				
Mining	0.531				
Non-Mining	0.251				
Mining and FB_NFB					
Auditor Ptge, Mining = 0, FB_NFB = 0	0.188				
Auditor Ptge, Mining = 0, FB_NFB = 1	0.769				
Auditor Ptge, Mining = 1, FB_NFB = 0	0.314				
Auditor Ptge, Mining = 1 FB_NFB = 1	0.294				
Levene's test of equality of error variances:	*F = 3.022, df1 = 3, df2 = 502, Sig. = 0.029**				

* $p < .05$; ** $p < .01$; *** $p < .001$
# Type III Sum of Squares
† Natural Logarithm

7.4.5 Firm Size and Market Adjusted Underpricing

$H_{7(a)}$: Firm size is negatively associated with the level of IPO initial underpricing

$H_{7(b)}$: The negative association between firm size and the level of IPO initial underpricing is moderated by family control.

The *size-effect* phenomenon is well documented in the finance literature particularly in respect to market efficiency and share price performance generally. Indeed, Schwert (1983) provides a useful synthesis of the early literature on size-effect and share returns, particularly the methodological aspects of the anomaly. Since 1983, several other contributors have documented size-effect anomalies and IPO underpricing including several Australian studies, Lee *et al.* (1996), Steen (1997) and How (1993). The theme within this extensive body of literature is that there is less uncertainty associated with larger firms in contrast to smaller firms and several reasons are advanced, including problems associated with information asymmetry. The argument surrounding size-effect is that more information is available for larger firms, providing greater certainty about these firms.

Given this theme, it was hypothesised that there would be a negative relationship between the size of the firm and the level of market adjusted underpricing. Several contributors to the literature have reported an association between firm size and the level of underpricing, including Banz (1981), Davis and Yeomans (1976), Chalk and Peavy (1987), Young and Zaima (1988), How (1993), Lee *et al.* (1996) and Steen (1997). Moreover, since we know that family firms are appreciably smaller than non-family firms (see Chapter 6), we would also expect to find that the level of underpricing would be moderated by firm type. In this regard the level of underpricing for family firms would be expected to be higher.

Given the above evidence, the expected sign of the independent variables (used as proxies for firm size) on market adjusted underpricing are shown in Table 7.20.

Table 7.20: Predicted Sign for Firm Size Variables

Variable	Expected Signage (+ / -)
Natural Log of Firm Age	-
Natural Log of Firm Assets	-
Natural Log of Issue Size	-

Regression Results – Table 7.21 shows the WLS analysis for market adjusted underpricing as the dependent variable and firm size (firm assets, firm sales and firm age) and mining as independent variables. The analysis demonstrates that firm assets and sales are positively associated with underpricing, which is inconsistent with the predicted direction, while issue size is in the predicted direction. However, none of the independent variables are statistically significant (firm assets [$t = .599, p > .05$], firm sales [$t = .048, p > .05$], and issue size, [$t = -1.202, p > .05$]). Moreover, while the omnibus test ($F = 2.44$, df = 4, 148, $p < .05$) indicates that the overall strength of the model is statistically significant, the model accounts for only 3.3% % of the variance. Given these findings, hypothesis $H_{7(a)}$: that *"Firm size is negatively associated with the level of IPO initial underpricing"* is **not supported by the findings** in this study.

Table 7.21: Weighted Least Squares Regression – Firm Size and Mining on Market Adjusted Underpricing

	Market Adjusted Underpricing (UP2) †			
Independent Variables	χ **(Gamma)**	**SE**	***t* - value**	**Sig.**
Firm Assets (size proxy) †	0.063	0.113	0.559	-
Firm Sales (size proxy) †	0.005	0.103	0.048	-
Issue Size (size proxy) †	0-.090	0.075	-1.202	-
Mining	-0.162	0.018	-9.119	-
WLS Regression Model	**Adjusted R^2**	***F*-Value**	**Sig.**	
	0.033	2.44	$P < .05$ (df=4, 148)	

† Natural Logarithm

Tables 7.22 to 7.24 show the results of three separate factorial ANOVAs used to determine whether the negative association between the level of market adjusted underpricing and firm size (as represented by the natural log of individual independent variables; total assets, total sales and issue size), is moderated by the addition of family and non-family firms. i.e. beyond that explained by firm size.

Table 7.22: Factorial ANOVA – Firm Size (Firm Assets), Mining and FB_NFB, on Market Adjusted Underpricing (UP2)

Parameters & Interacting Effects	Market Adjusted Underpricing (UP2) †				
	B	SE	Eta Squared	t - value	Sig.
Parameter Estimates					
Firm Assets†, Mining=0, FB_NFB=0	-0.181	0.009	0.013	-1.921	0.056
Firm Assets†, Mining=0, FB_NFB=1	-0.215	0.015	0.007	-1.388	0.166
Firm Assets†, Mining=1, FB_NFB=0	-1.130	0.009	0.006	-1.254	0.211
Firm Assets† ,Mining=1, FB_NFB=1	-2.131	0.011	0.014	-2.016	0.045*
Between Subjects Effects (Model)					
Firm Assets†, Mining & FB_NFB	*(SS)#*	1.60			
	F-Value	1.902	$df = 4$	*Sig.* 0.110	
	Eta (R)²	0.027			
	Adj. R²	0.013			
Estimated Means					
Mining – Non -Mining	**UP2 Means**				
Mining	-3.980				
Non-Mining	0.289				
Mining and FB_NFB					
Firm Assets†, Mining = 0, FB_NFB = 0	0.265				
Firm Assets†, Mining = 0, FB_NFB = 1	-8.245				
Firm Assets†, Mining = 1, FB_NFB = 0	0.314				
Firm Assets†, Mining = 1 FB_NFB = 1	0.284				
Levene's test of equality of error variances:	***F = 1.105, df1 = 3, df2 = 279, Sig = 0.348***				

* $p < .05$; ** $p < .01$; *** $p < .001$
# Type III Sum of Squares
† Natural Logarithm

Consistent with the predicted direction, Table 7.22 shows that there is a negative association between firm assets, and market adjusted underpricing in all combination of independent variables (i.e. firms assets with combinations of family/non-family and mining/non-mining). However only two cases are statistically significant, namely;

- family firm with mining (t = -1.921, p < .05) with a small effect size (Eta^2 = .013), and
- non-family firms with mining (t = -2.016, p < .05) with a small effect size (Eta^2 = .086).

Despite the significance of these results nonetheless, the strength of the factorial model is not statistically significant (Adjusted R^2 = .033, F [4,283] = 1.902, p > .05).

Table 7.23 similarly shows a negative association between firm sales and market adjusted underpricing in all combination of independent variables except for family firms with mining, however, in all cases the results are not statistically significant.

Table 7.23: Factorial ANOVA – Firm Size (Firm Sales), Mining and FB_NFB, on Market Adjusted Underpricing (UP2)

Parameters & Interacting Effects	Market Adjusted Underpricing (UP2)†				
	B	SE	Eta Squared	*t* - value	Sig.
Parameter Estimates					
Firm Sales†, Mining=0, FB_NFB=0	-0.005	0.009	0.001	-0585	0.559
Firm Sales†, Mining=0, FB_NFB=1	0.021	0.012	0.013	-1.753	0.081
Firm Sales†, Mining=1, FB_NFB=0	-1.130	0.008	0.001	-0.543	0.588
Firm Sales†, Mining=1, FB_NFB=1	-0.0046	0.009	0.014	-1.838	0.067
Between Subjects Effects (Model)					
Firm Sales†, Mining & FB_NFB	*(SS)#*	2.56			
	F-Value	4.06	*df* = 4	*Sig.* 0.003**	
	Eta $(R)^2$	0.066			
	Adj. R^2	0.05			
Estimated Means					
Mining – Non -Mining	**UP2 Means**				
Mining	1.872				
Non-Mining	0.264				
Mining and FB_NFB					
Firm Sales†, Mining = 0, FB_NFB = 0	0.261				
Firm Sales†, Mining = 0, FB_NFB = 1	3.491				
Firm Sales†, Mining = 1, FB_NFB = 0	0.268				
Firm Sales†, Mining = 1 FB_NFB = 1	0.253				
Levene's test of equality of error variances:	*F = 8.988, df1 = 3, df2 = 231, Sig = 0.000****				

* $p < .05$; ** $p < .01$; *** $p < .001$
# Type III Sum of Squares
† Natural Logarithm

Using factorial ANOVA analysis, Table 7.24 shows a negative association between issue size and all combinations of independent variables and market adjusted underpricing, which is consistent with the predicted direction. Moreover, using a more stringent alpha (.025) to overcome a significant Levene's test score ($p < .005$), the results show that the interacting effect of the following independent variables on market adjusted underpricing are statistically significant;

- family firms with mining (t = -2.546, p < .05) with a small effect size (Eta^2 = .013), and
- non-family firms with mining (t = -2.733, p < .05) with a small effect size (Eta^2 = .015), and
- family firms with mining (t = -2.288, p < .05) with a small effect size (Eta^2 = .010), and

The factorial model is also statistically significant, (Adjusted R^2 = .025, F [4,512] = 4.248, p < .05).

Table 7.24: Factorial ANOVA – Firm Size (Issue Size), Mining and FB_NFB, on Market Adjusted Underpricing (UP2)

Parameters & Interacting Effects	**Market Adjusted Underpricing (UP2)**†				
	B	**SE**	**Eta Squared**	***t* - value**	**Sig.**
Parameter Estimates					
Issue Size†*, Mining=0, FB_NFB=0*	-0.039	0.015	0.013	-2.546	0.011*
Issue Size†*, Mining=0, FB_NFB=1*	-0.020	0.017	0.003	-1.191	0.234
Issue Size†*, Mining=1, FB_NFB=0*	-0.031	0.014	0.010	-2.288	0.023*
Issue Size†*, Mining=1, FB_NFB=1*	-0.042	0.016	0.015	-2.733	0.006**
Between Subjects Effects (Model)					
Issue Size†*, Mining & FB_NFB*	*(SS)*#	3.857			
	F-Value	4.28	*df* = 4,512	*Sig.* 0.002**	
	Eta (R)^2	0.066			
	Adj. R^2	0.025			
Estimated Means					
Mining – Non -Mining	**Means**				
Mining	1.691				
Non-Mining	0.197				
Mining and FB_NFB					
Issue Size†*, Mining = 0, FB_NFB = 0*	0.080				
Issue Size†*, Mining = 0, FB_NFB = 1*	3.084				
Issue Size†*, Mining = 1, FB_NFB = 0*	0.314				
Issue Size†*, Mining = 1 FB_NFB = 1*	0.298				
Levene's test of equality of error variances: *F =4.395, df1 = 3, df2 = 508, Sig. = 0.005***					

* p < .05; ** p < .01; *** p < .001
# Type III Sum of Squares
†Natural Logarithm

The results in Tables 7.22 to 7.24 above indicate that at least one proxy for firm size (i.e. issue size) is significantly and negatively associated with market adjusted underpricing, and accounts for 2.5% of the variance. Moreover, the interacting effects of several combinations of independent variables are statistically significant indicating that the existence of family firms moderates the results. Indeed this is supported by changes in the mean value of UP2 with the different combination of independent variables with issue size. For instance, the mean value of UP2 with issue size and mining firms is \$1.69 whereas with FB_NB added, the mean value of UP2 for mining firms exhibits an appreciable increase to \$3.08. Given that family mining firms are smaller in size than all other categories (see Table 6.14 Chapter 6), this finding is consistent with the theory adopted in this study since smaller firms require a higher UP2 (thus larger returns) to compensate for the higher risk involved. Moreover, the converse applies for larger firms which have exhibited lower returns after FB_NFB has been added into the factorial ANOVA. For instance, the mean value of UP2 with issue size and non-mining is \$0.20, and decreases appreciably to \$0.08 after the addition of FB_NFB. Similarly, the mean value of UP2 for non-family mining firms with issue size is \$1.69, whereas with FB_NFB added, UP2 decreases appreciably to \$0.31. These findings **provide support** for Hypothesis $H_{7(b)}$: that "*The negative association between firm size and the level of IPO initial underpricing is moderated by family control*".

7.4.6 Firm Risk and Market Adjusted Underpricing

The results of testing the following hypotheses are provided in this section;

> ***$H_{10(a)}$***: *Firm risk is positively associated with the level of IPO initial underpricing*
>
> ***$H_{10(b)}$***: *The positive association between firm risk and the level of IPO initial underpricing is moderated by family control*

The risk/reward equation has been well documented in the finance literature and it is generally accepted that high-risk firms are more likely to have greater variability in share returns. We would thus expect similar findings in the IPO literature. Indeed several contributors to the literature report a positive relationship between firm risk (as measured by several proxies for firm risk) and the level of initial underpricing, including Taylor and

Stokes (1995) and Lee *et al.* (1996). Table 7.25 shows the risk proxies used in this study together with the predicted sign. The rationale for the expected sign for each dependent variable can be explained as follows. Firm assets and issue size are in fact proxies for firm size and thus the larger the firm, the less uncertainty about future prospects and therefore the lower the level of underpricing. We would expect therefore that firm size (as proxied by assets and issue size) would be negatively related to underpricing. Similar arguments hold for firm age, since older firms with a known trading history are perceived as being more stable than their younger counterparts. Thus we would also expect a negative relation between firm age and underpricing. Following this line of logic, we could posit that the higher the level of uncertainty, the higher the level of underpricing since investors will expect to be compensated for the higher risk. Thus the expected sign for ex ante uncertainty is positive.

Table 7.25: Predicted Signs –Firm Risk with Market Adjusted Underpricing

Variable	Expected Signage (+ / -)
Natural Log of Firm Age	-
Natural Log of Firm Assets	-
Natural Log of Issue Size	-
Standard Deviation of Returns	+

Regression Results – The WLS analysis (Table 7.26) for market adjusted underpricing as the dependent variable, and firm risk (as proxied by firm assets, issue size, ex ante uncertainty, and firm age) together with mining as independent variables, demonstrates that ex ante uncertainty and mining are significantly associated with market adjusted underpricing (t = 11.135, $p < .001$ and t = -6.202, $p < .001$, respectively). Moreover, the omnibus test indicates that the WLS model is significant (F = 3.16, df = 5, 267, p >.01) and accounts for 5.7% of the variance. In addition, the sign of all risk proxies are in the predicted direction. Thus, notwithstanding that ex ante uncertainty is the only significant risk variable; the results reported in Table 7.26 are significant. Accordingly, hypothesis $H_{10(a)}$: that *firm risk is positively associated with the level of IPO initial underpricing* is **supported in this study.**

Table 7.26: Weighted Least Squares Regression – Firm Risk and Mining on Market Adjusted Underpricing

	Market Adjusted Underpricing (UP2)†			
Independent Variables	**χ (Gamma)**	**SE**	**t-value**	**Sig.**
Firm Assets (risk proxy)†	-0.031	0.122	-0.253	-
Firm Age (risk proxy)†	-0.032	0.050	-0.638	-
Issue Size (risk proxy)†	-0.026	0.080	-0.324	-
Ex ante Uncertainty‡ (risk proxy)	0.186	0.017	11.14	< 0.001
Mining (fixed factor)	-0.149	0.024	-6.202	< 0.001
WLS Regression Model	**Adjusted R^2**	**F-Value**	**Sig.**	
	0.057	3.16	<.01 (df=5, 148)	

†Natural Logarithm
‡Standard Deviation of Share Returns for 1st 20 days post-listing.

To determine whether the addition of family and non-family firms has a moderating effect on the relationship between firm risk and market adjusted underpricing, separate factorial ANOVA models were conducted for individual risk proxies. Indeed the results of these tests for firm age, firm assets and issue size with market adjusted underpricing, have already been reported in Tables 7.15, 7.22, 7.23 7.24 above. Briefly recalling the results of these analyses:

- firm age is negatively but not significantly associated with market adjusted underpricing,
- firm assets is negatively but not significantly associated with market adjusted underpricing, and
- issue size is negatively and significantly associated with market adjusted underpricing.

Additionally, the results of the factorial ANOVA with ex ante uncertainty and mining as independent variables, on market adjusted underpricing are shown in Table 7.27. The factorial model is significant (F = 5.187, df = 4, 490, p < .01) and accounts for 3.3% of the variance. Moreover, after setting an alpha level of .025 to overcome a significant Levene's test score (p < .001), ex ante uncertainty with family firms and mining, is significantly and positively associated with market adjusted underpricing (t = 3.149, p < .025) with a small effect size (Eta^2 = .020). Indeed the results also show that the mean value of UP2 with exante uncertainty for mining firms is $0.87, whereas with FB_NFB UP2 added, UP2 increases appreciably to $1.47. This finding is consistent with the 'size-effect theme discussed earlier that smaller firms (as is the case with family mining firms, see Table 6.14 Chapter 6) have a higher risk profile and thus higher returns are required to compensate investors. Given the above results therefore, Hypothesis $H_{10(b)}$: that "*The positive association between firm risk and the level of IPO initial underpricing is moderated by family control*" is **supported in this study.**

Table 7.27: Factorial ANOVA – Firm Risk, Mining and FB_NFB, on Market Adjusted Underpricing (UP2)

Parameters & Interacting Effects	**Market Adjusted Underpricing (UP2)** †				
	B	**SE**	**Eta Squared**	***t*-value**	**Sig**
Parameter Estimates					
Ex ante Unc'ty‡, Mining=0, FB_NFB=0	-1.654	1.21	0.004	1.366	0.172
Ex ante Unc'ty‡, Mining=1, FB_NFB=0	7.845	2.49	0.020	3.149	0.002**
Ex ante Unc'ty‡, Mining=0, FB_NFB=1	1.467	0.709	0.009	-2.069	0.039*
Ex ante Unc'ty‡, Mining=1, FB_NFB=1	-0.951	1.00	0.002	-0.951	0.342
Between Subjects Effects (Model)					
Ex ante Unc'ty‡, Mining & FB_NFB	**(SS)** #	4.84			
	F-Value	5.187	df = 4,490	Sig. 0.000***	
	Eta $(R)^2$	0.041			
	Adj. R^2	0.025			
Estimated Means					
Mining – Non -Mining	**Means**				
Mining	0.866				
Non-Mining	0.242				
Mining and FB_NFB					
Ex ante Unc'ty‡, *Mining = 0, FB_NFB = 0*	0.187				
Ex ante Unc'ty‡, *Mining = 0, FB_NFB = 1*	0.297				
Ex ante Unc'ty‡, *Mining = 1, FB_NFB = 0*	1.475				
Ex ante Unc'ty‡, *Mining = 1 FB_NFB = 1*	0.258				
Levene's test of equality of error variances:	*F =4.090, df1 = 3, df2 = 486, Sig = 0.007***				

* $p < .05$; ** $p < .01$; *** $p < .001$

\# Type III Sum of Squares

† Natural Logarithm

‡ Risk proxy measured by the standard deviation of share returns over 20 days post listing

7.4.7 Profit Forecasts and Market Adjusted Underpricing

The results of testing the following hypotheses are provided in this section;

> $H_{11(a)}$: *Profit forecast is negatively associated with the level of IPO initial underpricing*

> $H_{11(b)}$: *The negative association between profit forecast and the level of IPO initial underpricing is moderated by family control*

Several contributors to the IPO literature have examined the link between the existence of a profit forecast in prospectus documents and the level of initial underpricing, including the study by How (1993), which documents recent evidence in the Australian context. The underlying theme in this line of research is that more information (relating to future outcomes) included in offer documents reduces uncertainty, and thus the level of initial underpricing. Indeed the principal findings in the literature support this theme, and in particular a negative relationship between the existence of a profit forecast and the level of initial underpricing (How, 1995; Steen, 1997; Clarkson *et al.*, 1991; Holland & Horton, 1993). Given these findings we would expect to find a negative relationship between profit forecast and market adjusted underpricing in this study.

Comparison of Mean Values – The results in table 7.28 show that firms with a profit forecast included in their prospectus had lower underpricing (31%) than firms without a profit forecast (33%), however these results were not statistically significant ($t = 0.202$, $df = 298$, $p > .05$). There are also differences in the level of underpricing between firms with profit forecasts and firms without profit forecasts within the mining group: 47% (with forecast) and 33% (without forecasts) and also within the non-mining group 29% (with forecast) and 33% (without forecasts). Interestingly, firms with a profit forecast are more underpriced than firms without a profit forecast, in contrast to the non-mining group where the reverse is true. However, the differences in the mean values of UP2 between firms with and without a profit forecast in both the mining and non-mining groups are not statistically significant ($t = 0.339$, $df = 107$, $p > .05$, non-mining, and ; $t = -0.286$ $df = 35$, $p > .05$, mining).

Table 7.28 also shows differences in the level of underpricing between firms with and without profit forecasts within the family group: 34% (with forecast) and 45% (without forecasts) and also the non-family group 30% (with forecast) and 31% (without forecasts). However, the differences between firms with and without profit forecasts in both family firms (t = .369 df = 51, p > .05) and non-family firms (t = 0.127 df = 218, p > .05) are not statistically significant.

A final point of interest in Table 7.28 is the differences between the mean values of UP2 for family firms with a profit forecast (19%, n = 78) and without a profit forecast (7,7%, n = 14), and non-family firms with a profit forecast (33%, n = 218) and without a profit forecast (39%, n = 64) in the non-mining group. However, for both family and non-family firms, the differences in market adjusted underpricing between firms with and without a profit forecast were not statistically significant, (t = 0.827, df = 16, p > .05 family firms, t = 0413, df = 92, p > .05).

Table 7.28: Mean Values for Market Adjusted Underpricing by Profit Forecast

Groupings	n	Mean Value	St Dev	*t*-stat	df	Sig.
All Observations						
With Forecast	326	0.31	1.02			
Without Forecast	182	0.33	1.35			
*t-test**				0.202	298	0.840
Mining						
With Forecast	29	0.47	2.45			
Without Forecast	79	0.33	0.91			
*t-tests**				-0.286	35	0.777
Non-Mining						
With Forecast	297	0.29	0.75			
Without Forecast	103	0.33	1.60			
*t-tests**				0.339	107	0.735
Family						
With Forecast	81	0.34	1.49			
Without Forecast	29	0.45	1.42			
*t-tests**				0.369	51	0.714
Non-Family						
With Forecast	244	0.30	0.81			
Without Forecast	151	0.31	0.134			
t-tests*				0.127	218	.899
Mining						
Family						
With Forecast	3	4.32	7.67			
Without Forecast	15	0.81	1.88			
*t-tests**				-0.788	2	0.511
Non-Family						
With Forecast	26	0.02	0.18			
Without Forecast	87	0.26	1.56			
*t-tests**				1.369	93	0.174
Non-Mining						
Family						
With Forecast	78	0.19	0.38			
Without Forecast	14	0.08	0.47			
*t-tests**				-0.827	16	0.420
Non-Family						
With Forecast	218	0.33	0.85			
Without Forecast	64	0.39	0.99			
*t-tests**				0.413	92	0.680

*Since Levene's test has a probability of < .05, equality of variances is not assumed.

Regression Results – Table 7.29 shows that profit forecast is positively associated with market adjusted underpricing and therefore inconsistent with Hypothesis $H_{6(a)}$. Moreover, the overall strength of the regression WLS model is not statistically significant (Adjusted $R^2 = .006$, $F\ [2,507] = 1.50$, $p > .05$). In addition, independent *t-tests* for profit forecast as an independent variable on market adjusted underpricing, is also not statistically significant ($t = 1.272$, $p > .05$). Given these findings, hypothesis $H_{11(a)}$: that *profit forecast is negatively associated with the level of IPO initial underpricing* is **not supported in this study.**

Table 7.29: Weighted Least Squares Regression – Profit Forecast and Mining on Market Adjusted Underpricing

	Market Adjusted Underpricing (UP2) [†]			
Independent Variables	**χ (Gamma)**	**SE**	**t - value**	**Sig.**
Profit Forecast	0.019	0.015	-1.272	-
Mining	-.063	0.014	-4.372	-
WLS Regression Model	**Adjusted R²**	***F*-Value**	**Sig**	
	0.006	1.50	$P > .05$ (df=2, 507)	

† *Natural Logarithm*

To determine if the interacting effect of firm type (family and non-family) moderated prediction of market adjusted underpricing, beyond that explained by profit forecast and mining using WLS, a factorial ANOVA analysis was again applied. The results in Table 7.30 show that after setting a high alpha of .025 (to overcome a significant Levene's test score) profit forecast is significantly associated with market adjusted underpricing for one combination of independent variables; profit forecast with family firms and mining ($t = 2.590$, $p < .025$, with a small effect size $Eta^2 = .013$). Moreover the factorial model is also statistically significant (Adjusted $R^2 = .011$, $F\ [4,504] = 2.422$, $p < .05$). However, the B coefficient of independent variable profit forecast is positive which is inconsistent with the predicted direction. Accordingly, hypothesis $H_{11(b)}$: that "*The negative association between profit forecast and the level of IPO initial underpricing is moderated by family control*" is **not supported in this study.**

Table 7.30: Factorial ANOVA – Profit Forecast, Mining and FB_NFB, on Market Adjusted Underpricing (UP2)

Parameters & Interacting Effects	Market Adjusted Underpricing (UP2) †				
	B	SE	Eta Squared	*t* - value	Sig.
Parameter Estimates					
Profit Forecast, Mining=0, FB_NFB=0	0.042	0.063	0.001	0.669	0.504
Profit Forecast, Mining=0, FB_NFB=1	0.057	0.047	0.003	1.236	0.217
Profit Forecast, Mining=1, FB_NFB=0	0.697	0.269	0.013	2.590	0.010**
Profit Forecast, Mining=1, FB_NFB=1	-0.091	0.095	0.002	-0.956	0.340
Between Subjects Effects (Model)					
Profit Forecast, Mining & FB_NFB	*(SS)* #	2.067			
	F-Value	2.422	*df* = 4	*Sig.* 0.047	
	Eta $(R)^2$	0.019			
	Adj. R^2	0.011			
Estimated Means					
Mining – Non -Mining	**UP2 Means**				
Mining	1.519				
Non-Mining	0.285				
Mining and FB_NFB					
Profit Forecast, Mining = 0, FB_NFB = 0	0.239				
Profit Forecast, Mining = 0, FB_NFB = 1	2.900				
Profit Forecast, Mining = 1, FB_NFB = 0	0.331				
Profit Forecast, Mining = 1 FB_NFB = 1	0.139				
Levene's test of equality of error variances:	*F = 3.492, df1 = 3, df2 = 500, Sig = 0.016*				

* $p < .05$; ** $p < .01$; *** $p < .001$
# Type III Sum of Squares
† Natural Logarithm

7.5 Market and Exogenous Factors with Market Adjusted Underpricing

7.5.1 Pre-Post Corporations Law and Market Adjusted Underpricing

The results of testing the following hypotheses are provided in this section;

> ***H_8*** *: The level of initial underpricing of Australian IPOs are lower in periods after introduction of the Corporations Law 1991, than before introduction of the law.*

Several contributors to the IPO literature have attributed differences in the level of underpricing to the severity of the regulatory environment. The principal theme in these contributions is that a harsh environment has the propensity to impose severe penalties for non-compliance, forcing issuers to disclose additional and more accurate information in order to mitigate the threat of litigation (Tinic, 1988; Drake & Vetsuypens, 1993). In the Australian context, Steen (1997) provides evidence that changes to the corporate regulatory system in Australia led to more detailed disclosures by issuers and subsequently lower levels of underpricing for IPOs that listed after the regulatory changes. Similarly, it was hypothesised in Chapter 4 that IPOs listing after the introduction of the Corporations Law would have lower levels of underpricing compared with those listing before the Corporations Law.

Comparison of Mean Values – Table 7.31 shows that the mean value of market adjusted underpricing for IPO firms listing before the introduction of the Corporations Law was 9% compared with 34% for firms listing in the post Corporation Law period. The difference in returns between the two periods is significant; $t = 3.416$, $df = 182$, $p < .05$. Similarly mining companies were less underpriced in the pre Corporate Law period (5%) than in the post Corporate Law period (41%) and there were also significant differences in the returns between the two periods; $t = 2.175$, $df = 42$, $p < .05$. Moreover, for the non-mining group the differences in returns for the pre period (12%) and post period (32%) were also significant; $t = -1.96$, $df = 13$, $p < .05$. In addition family firms were less underpriced (25%) in the pre Corporate Law period compared to the post-Corporate Law period (35%), but to a considerably lesser extent than non-family firms (pre-6% and post-34%). Moreover, latter differences in returns for the pre-post period for non-family firms were significant; $t = -3.685$, $df = 157$, $p < .05$.

Table 7.31: Market Adjusted Underpricing Mean Values by Pre-Post Corporations Law

Groupings	n	Mean Value	St Dev	*t*-stat	df	Sig.
All Observations						
Pre- Corp Law	48	.09	.36			
Post-Corp Law	496	.34	1.20			
*t-test**				-3.416	182	.001
Mining						
Pre- Corp Law	21	0.05	.23			
Post-Corp Law	117	0.41	1.92			
*t-tests**				-2.175	42	.035
Non-Mining						
Pre- Corp Law	27	.12	.44			
Post-Corp Law	379	.32	.87			
*t-tests**				-1.96	130	.050
Family						
Pre- Corp Law	8	.25	.46			
Post-Corp Law	107	.35	1.48			
*t-tests **				-0.484	21	0.633
Non-Family						
Pre- Corp Law	40	.06	.34			
Post-Corp Law	389	.34	1.12			
t-tests*				-3.685	157	0.000

*Since Levene's test has a probabiliy of < .05, equality of variances is not assumed

These results are not consistent with Hypotheses H_8, since in all cases the level of underpricing was considerable lower in the pre Corporations Law period than in the post Corporation Law period. One possible explanation for this finding is the delayed effect of the 1987 Stock Market collapse, followed by subsequent decrements in share prices over an extended 'cold market' period. The results in the following section partially support this explanation, given that the period immediately prior to the introduction of the Corporations Law was predominantly characterised by 'cold market' cycles.

7.5.2 Market Cycles and Market Adjusted Underpricing

The results of testing the following hypotheses are provided in this section;

> ***$H_{9(a)}$*****:** *IPOs are more underpriced during 'hot' market periods than for 'cold' market periods*

> ***$H_{9(b)}$*****:** *The level of underpricing for both hot and cold periods is moderated by family control.*

The IPO literature abounds with research contributions supporting a positive association between the level of underpricing and hot market periods and the converse of these findings with regard to cold markets (e.g., How 1990; Steen 1997). The basic theory underlying these findings is that issuers will synchronise IPOs to coincide with favourable market conditions, ensuring the success of the issue. We would expect therefore to find more IPOs listing during hot period than cold periods.

Comparison of Mean Values – The results in Table 7.32 show that mean market adjusted underpricing level for firms that listed during hot market periods was 31% and 30% for those that listed during cold market periods. This finding is consistent with hypothesis H9(a), however, the results are not statistically significant ($t = -0.166$, $df = 478$, $p > .05$). Thus hypothesis, $H_{9(a)}$: that "*IPOs are more underpriced during 'hot' market periods than for 'cold' market periods*" is **not supported in this study.**

Table 7.32: Mean Values for Market Adjusted Underpricing– Hot and Cold Market Cycles

Groupings#	n	Mean Value	Std Dev	*t*-stat	df	Sig.
All Observations						
Hot	276	0.31	1.07			
Cold	240	0.30	1.22			
*t-test**				-0.166	478	0.868
Mining						
Hot	74	0.26	1.99			
Cold	58	0.49	1.67			
*t-tests**				0.728	111	0.468
Non-Mining						
Hot	202	0.34	0.73			
Cold	182	0.24	0.84			
*t-tests**				-1.243	362	0.215
Family						
Hot	70	.43	1.72			
Cold	42	.23	0.86			
t-tests				-0.810	107	0.420
Non-Family						
Hot	205	0.28	0.72			
Cold	196	0.32	1.29			
t-tests*				0.387	303	0.699

** Since Levene's test has a probability of < .05, equality of variances is not assumed*

Similarly, the results show that family firms have higher underpricing (43%) during hot market periods than cold market periods (23%). However, in spite of the level of underpricing for family firms (almost twice as high for hot periods than for cold periods), the differences in mean values between the two periods is not statistically significant (t = -0.810, df = 107, p > .05). Moreover, the level of underpricing for non-family firms is lower during hot periods (28%) than for cold periods (32%), and these differences are also not significant (t = -0.387, df = 303, p > .05). These findings **do not support hypothesis** $H_{9(b)}$: that "*The level of underpricing for both hot and cold periods is moderated by family control*".

The results also show that while mining firms are less underpriced during hot periods (26%) than cold market periods (49%), the reverse is true for non-mining firms, which is consistent with hypothesis 9(a). Non-mining firms are evidently more underpriced during hot market periods (34%) than cold market periods (24%), although in both cases (i.e. mining and non-mining) the differences in underpricing between hot and cold periods are not statistically significant (t = 0.728, df = 111, p > .05, [mining] and t = -1.243, df = 362, p > .05, [non-mining]).

A factorial 'between-subjects' ANOVA was conducted to assess differences among mean values on the level of underpricing attributable to both type of business and hot/cold cycle periods. Table 7.33 shows that there are no differences between family/non-family and mining/non-mining firms with respect to market adjusted underpricing. Indeed the ANOVA results demonstrate that the interacting effect of family/non-family with mining and non-mining is statistically insignificant (F-statistic = 5.08, p > .05).

Table 7.33: ANOVA - Type of Business and Market Cycle Effects on Market Adjusted Underpricing

Groupings	SS	df	MS	*F*	*p*
Mining/Non-Mining	12.50	1	12.50	0.858	0.588
Family/Non-Family Business	8.95	1	8.95	0.509	0.618
Market Cycle	0.38	1	0.07	0.00	0.00
<u>Interaction</u>					
Market Cycle/FB_NFB	3.01	1	3.01	0.845	0.527
Market Cycle/Mining/Non-Mining	0.01	1	0.01	0.003	0.965
FB_NFB/Mining/Non-Mining	18.12	1	18.12	5.083	0.266
Market Cycle/FB_NFB/Mining/Non-Mining	3.57	1	3.57	2.837	0.093
Intercept	46.29	1	46.29	13.87	0.925

7.6 Results of Multiple Regressions – Firm and Prospectus Attributes

As stated in the methodology section of this study, a full regression model is utilised to determine whether interacting as a group, specific factors attributable to the firm are significant predictors of market adjusted underpricing. In this regard, a weighted least squares regression model was used to establish whether the following firm and prospectus factors were associated with underpricing: firm value (natural logarithm of FVALUE) fractional ownership (FRACOWNE), firm age (natural logarithm of AGEYR), firm ex ante uncertainty (STD_DEV), issue size (natural logarithm of ISSIZE), underwriter reputation (UNDWREP), auditor reputation (AUDREPT) and firm type (FB_NFB) with Mining. Moreover, to control for the effects of multicollinearity and variable redundancy, four variables were excluded from the model, including firm assets (natural logarithm of TOTASS), firm sales (natural logarithm of PSALES), profit forecast (PROFFORC) and market cycles (MKTCYCLE).

Regression Results – With all the independent variables interacting as a group, Table 7.34 demonstrates a significant WLS model which accounts for more than 38% of the variance (Adjusted R^2 = 0.383, F [9, 232] = 15.46, $p < .001$). Moreover, several of the independent variables are significant predictors of market adjusted underpricing including, firm value (t = 6.295, $p < .01$), fractional interest (t = -4.393, $p < .01$), firm age (t = -2.697, $p < .01$), issue size (t = -5.469, $p < .01$), and underwriter prestige (t = -4.383, $p < .01$). Additionally, the sign for all of the variables are consistent with the predicted direction, except for fractional interest which shows a negative relation with market adjusted underpricing. Interestingly, ex ante uncertainty (STD_DEV), auditor prestige (AUDREPT) and firm type (FB_NFB) were not significantly associated with market adjusted underpricing. These are significant findings in the study since several independent variables provide considerable explanatory power which accounts for more than 38% of the variance in UP2. Moreover, except for firm type, ex ante uncertainty and auditor prestige, most of the independent variables were reliable predictors of market adjusted underpricing, including firm age, firm value, issue size, fractional interest, underwriter prestige, and mining. However, the evidence also shows that firm type (i.e., family and non-family firms) is not a significant variable in predicting market adjusted underpricing. Indeed this finding appears to be inconsistent with the evidence in Section 7.3 above which shows (using independent t-tests) that family firms are considerably less underpriced than non-family firms. Despite the significant independent t-test result, when initial underpricing is regressed on all relevant variables known to influence it, (arguably a more ust test of the significance of independent variables), firm type is shown to be insignificant in explaining variation in underpricing.

Table 7.34: Weighted Least Squares Regression – Firm and Prospectus Attributes on Market Adjusted Underpricing.

	Market Adjusted Underpricing (UP2) †			
Independent Variables	χ (Gamma)	SE	t - value	Sig.
Firm Value ††	1.003	0.145	6.931	0.01
Firm Age †	-0.132	0.049	-2.697	0.01
Issue Size †	-0.819	0.150	-5.469	0.01
Ex ante Uncertainty‡	0.033	0.037	0.913	-
Fractional Interest#	-0.157	0.036	-4.939	0.01
Underwriter Prestige (Dummy)	-0.091	0.021	-4.383	0.01
Auditor Prestige (Dummy)	0.000	0.016	-0.022	-
FB_NFB (Dummy - fixed factor)	0.006	0.020	0.723	-
Mining (Dummy - fixed factor)	0.070	0.017	3.501	0.01
WLS Regression Model	**Adjusted R^2**	***F*-Value**	**Sig.**	
	0.383	15.46	0.001	
			(*df*=9,232)	

† Natural Logarithm
‡ Standard Deviation of Share Returns for 1st 20 days post-listing.
†† Natural logarithm of total number of shares issued post IPO times share price on day 20
# Percentage of shares retained by existing shareholders

7.7 Summary and Conclusions

The purpose of this chapter was to analyse and report results from testing Hypotheses 1 – 11 developed in Chapter 4. The principal findings are that Australian IPO firms are underpriced and family firms are considerably (and significantly) less underpriced than non-family firms after controlling for industry effects. Accordingly, while Hypothesis 1 is supported, Hypothesis 2 is not supported. Moreover the variability of returns in the first 20 days after listing (often regarded as a reliable measure of ex ante risk) is considerably less for family firms compared with non-family firms after controlling for industry effects.

The findings for mean-value comparisons of the various independent variables, and for the univariate and multivariate regressions between the independent variables and dependent variables firm value and market adjusted underpricing, are summarised as follows:

- Family IPO firms have considerably higher levels of equity retention than non-family firms across all groups and there is a positive and significant association between firm value and fractional interest, between firm value and market adjusted underpricing, and between market adjusted underpricing and fractional interest for all observations, which is consistent with Hypotheses 3(a), 3(c) and 3(e). Moreover, after controlling for industry effects, these associations are moderated by firm type (family and non-family) and thus hypotheses 3(b), 3(d) and 3(f) are also supported by the findings.

- Using mean values, family IPO firms were found to be younger than non-family firms, although the results were not statistically significant. Interestingly however, median values show the reverse position and family firms are considerably and significantly older than non-family firms with statistical significance in both mining and non-mining groups.

- Results of univariate regressions show a negative association between firm age and market adjusted underpricing, which is consistent with Hypothesis 4(a), although the results were found to be statistically insignificant. Similar results were reported when firm type (family/non-family) was factored into the analysis; however these results were also not statistically significant. Thus Hypotheses 4(a) and 4(b) are not supported.

- Family firms with a prestigious underwriter have lower market adjusted underpricing than non-family firms using a prestigious underwriter. Moreover there is a negative association between underwriter prestige and market adjusted underpricing for all observations, which is consistent with Hypothesis 5(a), although the results are not statistically significant. Furthermore, the addition of firm type (family and non-family) to the analysis shows a negative association between underwriter prestige and market adjusted underpricing however the results are not statistically significant. Thus Hypotheses 5(a), and 5(b) are not supported.

- There is a negative association between auditor prestige and market adjusted underpricing which is consistent with predicted direction, although the results are not statistically significant and thus Hypothesis 6(a) is not supported. Similar findings were reported after adding firm type to the analysis and thus Hypothesis 6(b) is also not supported by the findings.

- As shown in Chapter 6, all mean values for firm size proxies (i.e. assets, sales and issue size) are considerably larger for non-family firms compared with family firms and these differences are statistically significant across all groups. Regression results however found that while there is a negative association between firm size and market adjusted underpricing, the results are not statistically significant. Thus Hypothesis 7(a) is not supported. In contrast, when firm type was factored into the analysis, issue size was found to be significantly and negatively associated with market adjusted underpricing. Thus Hypothesis 7(b) is supported in this study.

- The results show that market adjusted underpricing is higher for firms listed in periods after the introduction of the Corporations Law than for firms listing before the law was introduced, thus Hypothesis 8 is not supported. However, it is interesting to note that family firms across all groups were less underpriced than non-family firms in both, the pre and post introduction of the Corporations Law periods.

- The results show that market adjusted underpricing in not higher in hot market periods than in cold market periods for family and non-family firms.

- The results show that firm risk is a good predictor of market adjusted underpricing with three out of four proxies for risk (firm assets, firm age and share-price variability post issue) showing correct signage, although only share-price variability is statistically significant. Thus Hypothesis 10(a) is supported. After factoring firm type into the analysis, the results show that all proxies for risk are in the predicted direction and two of the variables (namely, issue size, and share-price variability) are statistically significant. Thus Hypothesis 10(b) is supported.

- Profit forecast is negatively associated with market adjusted underpricing as predicted. However, for both family and non-family firms the results are not statistically significant and thus both Hypothesis 11(a) and (b) are not supported.

- The results of the full weighted least squares regression (i.e., with all relevant variables in the model) show that firm value, fractional interest, firm age, issue size and underwriter prestige are all good predictors of market adjusted underpricing. Indeed these are significant findings since these independent variables provide considerable explanatory power which accounts for more than 38% of the variance in market adjusted underpricing. Notwithstanding the significance these findings however, the results also show that in addition to ex ante uncertainty and audit prestige, firm type (i.e., family and non-family firms) is not significantly associated with market adjusted underpricing. This finding is inconsistent with evidence using independent *t*-tests (in Section 7.3) which shows that family firms are considerably less underpriced than non-family firms. Given this ambiguity, it is advisable to place greater emphasis on the results of a full WLS regression as it is a more reliable test of the significance of firm type on initial underpricing.

Chapter 8: Results – Aftermarket Operating Performance

8.1 Introduction

The purpose of this chapter is to provide the results of aftermarket operating performance of family and non-family IPO firms. This chapter also examines the results of multivariate regressions of specific measures of operating performance with selected independent variables controlling for family and non-family firms, and for industry effects (i.e. mining and non-mining firms). Specifically, this chapter presents the findings from testing the formal hypotheses developed in Chapter 4.

8.2 Aftermarket Operating Performance

Using four different measures of operating performance, the results for family and non-family firms, and for family and non-family firms within the non-mining group, are presented in this section. However, except for a comparison of median operating performance, some results of mining firms have not been shown due to the small number of observations for both family and non-family and firms, which potentially violates statistical assumptions thus impacting on the reliability of results. As explained in Chapter 5, operating performance measures include JKROA, JKCFOA, STROA and STCFOA. Briefly, JKROA is a cashflow proxy derived by deflating earnings (after tax and depreciation) by total assets at end-of-period, whereas STROA is an earnings-based measure and thus more parsimonious than JKROA. STROA is derived by deflating earnings (after interest and tax) by total assets at end-of-period. JKCFOA is a cashflow performance measure, derived indirectly by subtracting capital expenditure from earnings (after tax and depreciation) and deflating the outcome by total assets at end-of-period, whereas STCFOA is a direct measure of cashflow performance derived by deflating cashflows from operating activities by total assets at end-of-period. Both JKROA and JKCFOA are variables based on the approach adopted by Jain and Kini (1994), whereas STROA and STCFOA are standard operating performance variables more appropriate to the Australian financial reporting environment. The results of deriving and testing these variables are now considered in the context of hypotheses 12 to 18.

H_{12}*: *Family IPO firms outperform non-family IPO firms in the long-term based on operating performance.

8.2.1 Post-Listing Operating Performance Results

Table 8.1 shows the median changes in the levels of operating returns measured over a three year period relative to Year -1. The results show that aftermarket operating returns for both family and non-family firms, and for family and non-family firms in the non-mining group, declined relative to pre-IPO levels. Moreover, the results were consistent across all measures of operating performance, i.e., JKROA, JKCFOA, STROA and STCFOA. For instance, the median changes in JKROA (JKCFOA) for family firms were -14% (-25%), -12.5% (-12%), -30% (-14%) for Years 0, +1 and +2 relative to Year -1, whereas for non-family firms, the median changes were in 0.0% (0.0%), 0.0% (-6.0%), and -10% (-25%) for Years 0, +1 and +2 relative to Year -1.

Table 8.1: Comparison of Median Operating Performance Levels – JKROA, JKCFOA, STROA and STCFOA*

	Family & Non-Family						Mining & Non-Mining					
	n	Family	n	Non-Family	MWU-Z**	*p* value	n	Family	n	Non-Family	MWU-Z**	*p* value
JKROA												
Years -1, 0	52	-0.140	137	0.000	-2.277	**0.023**	44	-0.140	115	0.060	-2.380	**0.017**
Years 0, +1	78	-0.125	216	0.000	-0.667	0.505	75	-0.140	197	0.000	-0.986	0.324
Years +1, +2	76	-0.300	299	-0.100	-1.333	0.183	60	-0.265	220	-0.055	-1.599	0.110
JKCFOA												
Years -1, 0	43	-0.250	138	0.000	-1.155	0.248	35	-0.260	116	-0.040	-1.204	0.229
Years 0, +1	68	-0.120	195	-0.060	-0.244	0.808	65	-0.130	178	-0.030	-0.371	0.711
Years +1, +2	75	-0.140	296	-0.250	-0.178	0.858	59	-0.160	218	-0.220	-0.071	0.943
STROA												
Years -1, 0	50	-0.045	138	0.020	-1.509	0.131	42	-0.045	116	0.065	-1.890	0.059
Years 0, +1	73	-0.080	211	0.000	-0.141	0.888	71	-0.080	192	0.000	-0.288	0.774
Years +1, +2	76	-0.245	297	-0.210	-0.702	0.482	60	-0.245	218	-0.180	-0.832	0.405
STCFOA												
Years -1, 0	43	-0.170	121	0.060	-1.589	0.112	36	-0.185	103	0.000	-1.599	0.110
Years 0, +1	90	-0.320	284	-0.105	-1.374	0.170	75	-0.290	217	-0.030	-1.374	0.169
Years +1, +2	67	-0.520	255	-0.100	-1.460	0.144	53	-0.540	191	-0.110	-2.136	**0.033**

* Details of operating performance levels for all measures of performance are shown in Appendices 5 to 8. ***Mann Whitney-U* test

Similar results were reported for STROA (STCFOA); -4.5% (-17%), -8% (-32%), and -24.5% (-52%) for family firms, and 2% (0.0%), 0.0% (-10.5%), and -21% (-10%), for non-family firms for Years 0, +1 and +2 relative to Year -1.

For the non-mining group, the median changes in JKROA (JKCFOA) for family firms were -14% (-26%), -14% (-13%), and -26.5% (-16%), and for non-family firms, 0.6% (4%), 0.0% (3%) and -5.5 (-22%), for Years 0, +1 and +2 relative to Year -1. Similarly, the results for STROA (STCFOA) were -4.5%(-18.5%), -8% (-29%), and -24.5% (-54%) for family firms, and for non-family firms, 6% (0.0%), 0.0% (-3%), and -18% (-11%) for Years 0, +1 and +2 relative to Year -1.

The results for the four different measures of operating performance above, show that, with the exception of JKCFOA for years (-1, +2), the median change in operating performance of family firms declined at a greater rate than the performance levels of non-family firms and these results were significant for JKROA in years (-1, 0) for all observations, and for the non-mining group for STCFOA in years (-1, +2). These findings therefore **do not provide support** for hypothesis H_{12}, that, *family IPO firms will outperform non-family IPO firms in the long-term, based on operating performance.*

The results however, support previous studies that document decrements in post-issue operating performance of IPO firms relative to their industry counterparts (Jain & Kini 1994; Balatbat, 2001). As explained in Chapters 4 and 5, these studies also examine a range of factors that may assist in explaining the decline in post-issue operating performance of IPO firms, for example the impact of different age groupings and different levels of retained changes in growth factors such as the level of capital expenditure (Jain & Kini, 1994) and the level of debt (Balatbat, 2001). This study also considers these factors, firstly, by examining the mean/median levels of operating performance (JKROA, JKCFOA, STROA and STCFOA) with different levels of fractional ownership and then, different age groupings, for each year. Secondly, by examining whether there is an association between operating performance and a combination of variables known to influence the level of performance (for example, the level of debt, fractional ownership, firm age and the level of capital expenditure). Consistent with Balatbat (2001), this analysis is undertaken by using multiple regression models.

8.3 Operating Performance and Level of Fractional Interest

Following the approach adopted in Balatbat (2001), the mean and median results of operating performance (using four different measures in this study) are compared with firms with different levels of retained ownership by original founder/shareholders. As explained in Chapter 5, the dichotomous classification level (i.e., the cut-off point) which delineates higher ownership firms from lower ownership firms is the median value of the variable 'fracowne'. Thus firms with retained ownership less than or equal to the median value of ownership, are classified as being in the lower ownership group, whereas firms with retained ownership higher than the median value are classified as being within the higher ownership group.

The results of higher ownership firms are compared with lower ownership firms for all observations, for groups comprising family non-family firms, and for family and non-family firm within the non-mining group. Results of significance testing for mean values using independent samples *t-statistics* are reported and in cases where statistical assumptions have been violated due to low group numbers, significance testing of median values is also shown using non-parametric *Z*-scores and *p*-values (i.e., using Mann-Whitney *U* tests).

The following hypotheses will be tested in this section;

> ***$H_{13(a)}$**: IPO firms with higher equity retention outperform IPO firms with lower equity retention in the long-term, and*

> ***$H_{13(b)}$**: Family IPO firms with higher equity retention outperform non-family IPO firms with higher equity retention in the long-term.*

8.3.1 Results - Operating Performance and Fractional Interest

Panels A & B of Table 8.2, show the mean and median values of all measures of operating performance for higher (lower) retained ownership firms for all observations, for family & non-family firms and for family and non-family firms within the non-mining group, for Year -1 through to Year +2.

Table 8.2: Operating Performance and Fractional Interest – All Observations, Family and Non-Family Firms and Family and Non-Family (Non-Mining Group) – Panel A: Years -1 & 0

Panel A: Year -1 and 0																				
	Year -1										Year 0									
Variable	Mean						Median				Mean						Median			
(& Grouping)	n	< .36	n	> .36	t stat	*p* value	< .36	> .36	MWU Z	*p* value	n	< .36	n	> .36	t stat	*p* value	< .36	> .36	MWU Z	*p* value
JKROA																				
All Observ.	90	0.055	82	-0.030	1.138	0.257	0.040	0.050	-0.230	0.818	177	-0.052	187	0.032	-2.054	**0.041**	0.020	0.060	-3.349	**0.001**
F & NF																				
- Family	50	0.083	8	0.036	0.224	0.823	0.085	0.000	-0.181	0.857	85	-0.098	16	0.056	-2.249	0.027	0.000	0.070	-2.512	**0.012**
- N Family	40	0.052	74	-0.110	1.412	0.164	0.040	0.030	-0.374	0.708	92	-0.047	171	0.010	-1.028	0.305	0.040	0.030	-2.149	**0.032**
Non-Mining																				
- Family	44	0.101	7	0.107	-0.038	0.970	0.100	0.090	-0.233	0.816	74	-0.088	12	0.073	-1.952	0.054	0.035	0.080	-2.276	**0.023**
- N Family	35	0.080	62	-0.097	1.366	0.179	0.050	0.050	-0.293	0.769	82	-0.018	126	0.049	-1.072	0.285	0.040	0.075	-1.496	0.135
JKCFOA																				
All Observ.	82	-0.009	79	-0.097	1.079	0.283	0.010	0.020	-0.247	0.805	176	-0.122	186	-0.025	-2.222	**0.027**	-0.010	0.010	-2.951	**0.003**
F & NF																				
- Family	43	0.012	5	-0.017	0.102	0.919	0.010	0.020	-0.236	0.813	84	-0.146	16	-0.008	-1.741	0.085	-0.040	0.015	-1.886	0.059
- N Family	39	-0.010	74	-0.186	1.422	0.162	0.010	0.030	-0.154	0.878	92	-0.120	170	-0.040	-1.353	0.177	-0.010	0.010	-2.137	**0.033**
Non-Mining																				
- Family	37	0.033	4	0.075	-0.195	0.846	0.045	0.030	-0.242	0.809	73	-0.147	12	0.016	-1.537	0.128	-0.005	0.020	-1.452	0.146
- N Family	34	0.013	62	-0.154	1.206	0.235	0.030	0.030	-0.077	0.939	82	-0.096	126	-0.024	-1.426	0.155	0.010	0.020	-1.522	0.128
STROA																				
All Observ.	90	0.047	80	-0.042	1.215	0.227	0.050	0.060	-0.251	0.801	176	-0.052	186	0.026	-1.964	**0.050**	0.030	0.065	-3.294	**0.001**
F & NF																				
- Family	50	0.080	6	0.025	0.245	0.808	0.105	0.075	-0.239	0.811	84	-0.098	16	0.055	-2.253	0.027	0.015	0.070	-2.568	**0.010**
- N Family	40	0.044	74	-0.125	1.410	0.166	0.050	0.045	-0.330	0.742	92	-0.048	170	-0.001	-0.876	0.382	0.030	0.055	-2.031	**0.042**
Non-Mining																				
- Family	44	0.124	5	0.096	0.180	0.858	0.120	0.105	-0.529	0.597	73	-0.088	12	0.072	-1.945	0.055	0.025	0.090	-2.336	**0.019**
- N Family	35	0.070	62	-0.111	1.328	0.192	0.070	0.070	-0.184	0.854	82	-0.018	126	0.039	-0.939	0.349	0.050	0.085	-1.462	0.144
STCFOA																				
All Observ.	83	0.032	83	-0.035	1.040	0.300	0.000	0.000	-0.282	0.778	179	-0.044	188	0.005	-1.781	0.076	0.000	0.000	-2.211	**0.027**
F & NF																				
- Family	45	0.063	7	-0.074	0.577	0.566	0.080	0.000	-1.399	0.162	85	-0.109	16	0.011	-2.051	0.043	0.000	0.000	-1.308	0.191
- N Family	38	0.029	76	0.013	0.271	0.787	0.000	0.030	-1.279	0.201	94	-0.038	172	0.000	-1.043	0.298	0.000	0.005	-1.915	0.055
Non-Mining																				
- Family	39	0.082	6	0.028	0.675	0.503	0.085	0.000	-1.576	0.115	74	-0.118	12	0.017	-1.029	0.325	0.000	0.020	-0.805	0.421
- N Family	33	0.044	63	0.012	0.440	0.661	0.010	0.030	-0.738	0.460	84	-0.027	126	0.008	-0.837	0.404	0.010	0.020	-1.230	0.219

*Appendix 9 provides a summary of statistical significance testing for fractional interest and operating performance

Table 8.3: Operating Performance and Fractional Interest – All Observations, Family and Non-Family Firms and Family and Non-Family (Non-Mining Group) – Panel B: Years +1 & +2*

Panel B: Year +1 and +2																				
	Year +1										Year +2									
Variable	Mean						Median				Mean						Median			
(& Grouping)	n	< .36	n	> .36	t stat	*p* value	< .36	> .36	MWU Z	*p* value	n	< .36	n	> .36	t stat	*p* value	< .36	> .36	MWU Z	*p* value
JKROA																				
All Observ.	165	0.052	114	-0.003	1.292	0.197	0.090	0.090	-0.778	0.437	137	-0.110	199	-0.081	-0.276	0.786	0.030	0.050	-1.310	0.190
F & NF																				
- Family	71	-0.210	11	0.055	-1.220	0.250	0.050	0.090	-1.763	0.078	63	-0.007	16	-0.153	1.659	0.101	0.050	0.050	-0.336	0.737
- N Family	94	0.080	103	-0.046	2.369	0.019	0.100	0.080	-1.501	0.133	74	-0.119	183	-0.020	-0.693	0.489	0.020	0.065	-1.637	0.102
Non-Mining																				
- Family	69	-0.228	10	0.052	-1.172	0.271	0.055	0.090	-1.550	0.121	53	0.063	12	-0.081	2.162	0.035	0.050	0.060	-0.042	0.966
- N Family	91	0.081	89	-0.053	2.398	0.018	0.100	0.080	-1.760	0.078	62	-0.097	126	0.019	-0.621	0.535	0.060	0.105	-1.430	0.153
JKCFOA																				
All Observ.	153	-0.036	109	-0.092	1.089	0.277	0.020	0.020	-0.929	0.353	136	-0.196	199	-0.130	-0.620	0.536	-0.030	0.020	-2.071	**0.038**
F & NF																				
- Family	66	-0.371	9	-0.034	-1.075	0.313	-0.020	0.020	-1.468	0.142	62	-0.104	16	-0.203	0.605	0.547	-0.005	0.005	-0.588	0.557
- N Family	87	-0.006	100	-0.136	2.077	0.040	0.025	0.020	-1.423	0.155	74	-0.204	183	-0.070	-0.940	0.348	-0.030	0.040	-2.272	**0.023**
Non-Mining																				
- Family	64	-0.411	8	-0.039	-1.058	0.325	-0.010	0.020	-1.309	0.191	52	-0.033	12	-0.137	0.704	0.484	0.020	0.040	-0.284	0.776
- N Family	85	0.007	86	-0.136	2.197	0.030	0.040	0.020	-1.816	0.069	62	-0.176	126	-0.031	-0.780	0.436	0.010	0.050	-1.968	**0.049**
STROA																				
All Observ.	160	0.038	109	-0.018	1.255	0.211	0.090	0.090	-0.771	0.441	136	-0.095	198	-0.086	-0.072	0.942	0.020	0.060	-1.604	0.109
F & NF																				
- Family	67	-0.217	11	0.049	-1.183	0.263	0.040	0.100	-2.012	**0.044**	62	-0.010	16	-0.155	1.626	0.108	0.050	0.055	-0.310	0.757
- N Family	93	0.067	98	-0.066	2.422	0.017	0.090	0.070	-1.883	0.060	74	-0.102	182	-0.027	-0.436	0.663	0.020	0.060	-1.947	0.052
Non-Mining																				
- Family	66	-0.236	10	0.044	-1.133	0.286	0.045	0.100	-1.753	0.800	52	0.063	12	-0.080	2.122	0.039	0.050	0.060	-0.026	0.979
- N Family	90	0.069	86	-0.072	2.448	0.016	0.095	0.070	-2.160	0.031	62	-0.065	125	0.013	-0.3[illegible]	0.726	0.050	0.100	-1.822	0.068
STCFOA																				
All Observ.	185	-0.043	210	-0.068	0.905	0.366	0.000	-0.010	-0.777	0.437	136	-0.047	200	-0.042	-0.1[illegible]	[illegible].902	0.010	0.020	-0.510	0.610
F & NF																				
- Family	83	-0.188	17	-0.043	-0.916	0.372	0.010	-0.010	-0.041	0.967	62	0.015	16	-0.093	1.054	0.295	0.045	0.010	-1.356	0.175
- N Family	102	-0.030	193	-0.089	1.775	0.078	0.000	-0.010	-1.005	0.315	74	-0.052	184	0.000	-1.238	0.217	0.000	0.025	-1.222	0.222
Non-Mining																				
- Family	72	-0.163	13	-0.044	-0.588	0.567	0.020	0.000	-0.751	0.452	52	0.060	12	-0.079	1.268	0.210	0.060	0.015	-1.747	0.081
- N Family	91	-0.003	133	-0.083	2.[illegible]23	0.035	0.010	0.000	-1.721	0.085	62	-0.033	127	0.017	-0.931	0.353	0.030	0.040	-0.376	0.707

*Appendix 9 provides a summary of statistical significance testing for fractional interest and operating performance

8.3.1.1 All Observations

For JKROA, the results for higher (lower) retained ownership firms were -3.0% (5.5%), 3.2% (-5.2%), -0.3% (5.2%), and -8.1% (-11.0%) for Years -1, 0, +1 and +2. These results show that lower ownership firms outperformed higher ownership firms in Years -1 and +1, whereas higher ownership firms outperformed lower ownership firms in Years 0 and +2, however these results were only statistically significant for Year 0 ($t = -2.054$, $df = 362$, $p < 0.05$). Interestingly, similar findings were also reported for all other measures of operating performance. For example the results for Years -1, 0, +1, and +2 for JKCFOA were -9.7% (0.1%), -2.5% (-12.2%), -9.2% (-3.6%), -13.0% (-19.6%), for STROA; -4.2% (4.7%), 2.6% (-5.2%), -1.8% (3.8%), -8.6% (-9.5%), and for STCFOA; -3.5% (3.2%), 0.5% (-4.4%), -6.8% (-4.3%), -4.2% (-4.7%). These results indicate that for all three measures of operating performance, lower ownership firms outperformed higher ownership firms in Years -1 and +1, and higher ownership firms outperformed lower ownership firms in Years 0 +2 (and in the latter case, the results were statistically significant in Year 0; JKCFOA, $t = -2.222$, $df = 360$, $p < .05$, STROA, $t = -1.964$, $df = 360$, $p < .05$, and STCFOA, $Z = -2.211$, $p < .05$ using non-parametric measures of significance).

The above results show that firms in the lower ownership category outperformed firms in the higher ownership category in Years -1 and +1, whereas firms in the higher ownership category outperformed firms in the lower ownership category in Years 0 and +2. However, the only statistically significant results are in Year 0 for all measures (i.e., the first available operating results after listing), and in each of these cases, higher ownership firms outperformed lower ownership firms.

Given these findings, some support is provided for other studies that document superior performance levels for firms with high equity retention (e.g. Jain & Kini, 1994; Balatbat, 2001). Moreover, the results report a consistency between all operating measures, for instance JKROA, JKFCOA, STROA and STCFOA all report significant differences between lower and higher ownership firms in Year 0, and in all cases higher ownership firms outperformed lower ownership firms. These findings also provide support for hypothesis 13(a), that IPO firms with higher equity retention will outperform IPO firms with lower equity retention in the long-term.

8.3.1.2 Family and Non-Family Firms

Table 8.2 shows the mean and median values of all measures of operating performance for higher (lower) retained ownership firms within the family and non-family groups. For JKROA, the results for higher (lower) retained ownership firms for Years -1, 0, +1 and +2 are; 3.6% (8.3%), 5.6% (-9.8%), 5.5% (-21.0%) and -15.3% (-0.7%), for family firms, and for non-family firms; -11.0% (5.2%), 10.0 % (-4.7%), -4.6% (8.0%) and -2.0% (-11.9%). These results indicate that firms with lower retained ownership outperformed firms with higher retained ownership in Years -1 and +2 for family firms, and in Years -1 and +1 for non-family firms (and for non-family firms, these results were statistically significant for Year +1, t = 2.369, df = 137, p < .05). Moreover, firms with higher retained ownership outperformed firms with lower ownership retention in Years 0 and +1 for family firms, and in Years 0 and +2 for non-family firms (results are significant only for Year 0 for both family firms; Z = -2.512, p < .05, and non-family firms; Z = -2.149, p < .05).

A similar pattern of results was reported for both JKCFOA and STROA respectively, i.e., firms with higher retained ownership outperformed firms with lower ownership retention in Years 0 and +1 for family firms, and in Years 0 and +2 for non-family firms. For instance, JKCFOA results for Years -1, 0, +1 and +2, for higher (lower) retained ownership firms are -1.7% (1.2%), 8.0% (-14.6%), -3.4% (-37.1%) and -20.3% (-10.4%) for family firms, and -18.6% (-1.0%), -4.0% (-12.0%); -13.6% (-0.6%), -7.0% (-20.4%) for non-family firms. For the same time period, the results for STROA for higher (lower) retained ownership firms are 2.5% (8.0%), 5.5% (-9.8%), 4.9% (-21.7%), -15.5%(-1.0%) for family firms, and -12.5% (4.4%), -0.01% (-4.8%), -6.6% (6.6%), -2.7% (-10.2%) for non-family firms. Moreover, for JKCFOA the results were statistically significant for non-family firms in Year +1, in which lower retained ownership firms outperformed higher ownership firms (t = 2.077, df = 130, p < .05), and in Years 0 and +2, in which higher ownership firms outperformed low ownership firms (Z = -2.137, p < .05 and Z = -2.272, p < .05). For STROA, the results were statistically significant for both family and non-family firms during years in which higher retained ownership firms outperformed lower retained ownership firms, namely Years 0 and +1 for family firms (Z = -2.568, p < .05 and Z = -2.012, p < .05), and Year 0 for non-family firms (Z = -2.031, p < .05).

For STCFOA, the results for higher (lower) retained ownership firms for Years -1, 0, +1 and +2 are; -7.4% (6.3%), 1.1% (-10.9%), -4.3% (18.8%), -9.3% (-1.5%), for family firms, and -1.3% (2.9%), 0.0% (-3.8%), +1; -8,9% (-3.0%), 0.0% (-5.2%) non-family firms. These results show that firms with higher retained ownership outperformed firms with lower retained ownership in Years 0 and +2 for both family and non-family firms, however the results were only statistically significant, for family firms in Year 0 (t = -2.051, df = 99, p < .05).

The above results for family firms reveal significant differences in operating performance between higher (lower) retained ownership firms in Years 0 (for measures other than JKCFOA) and for Year +1 for STROA, indicating that higher ownership firms outperformed lower ownership firms. For non-family firms, similar significant differences were reported for Year 0, except for STCFOA, and additionally in Year +2 for STROA and STCFOA, also indicating that higher ownership firms outperformed lower ownership firms. Notwithstanding however, there were also significant differences between higher and lower ownership firms in the non-family group for JKCFOA and STROA in Year +1, and in these cases lower ownership firms outperformed higher ownership firms.

There is a pattern of significant differences reported across measures of performance in Year 0 and in Year 2 (non-family firms), and in 9 cases, higher ownership firms outperformed lower ownership firms. However a pattern of significant differences has also emerged, albeit a small number of cases (3 in total), for non-family firms in Year +1. In these cases, lower ownership firms outperformed higher ownership firms. Notwithstanding, this study provides evidence that firms with higher ownership retention outperformed firms with lower retained ownership, particularly in the first year following listing. This is consistent with agency theory which posits that higher (owner/founder) ownership firms outperform their lower ownership counterparts (Jensen & Meckling, 1976). Similarly, these results support the findings in the study by Jain and Kini (1994), which documented superior operating returns for firms with higher equity retention relative to their industry counterparts.

In this study, however there were no significant differences reported for family firms in the limited number of cases where lower ownership firms outperformed higher ownership firms, in contrast to non-family firms where three cases were reported for Year +1. This suggests that family firms are more likely to exhibit significant differences in cases where higher ownership firms outperformed lower ownership firms than in cases where lower ownership firms outperformed higher ownership firms, relative to non-family firms. These **findings lend support** to hypothesis 13(b), that *Family IPO firms with higher equity retention outperform non-family IPO firms with higher equity retention in the long-term.*

8.3.1.3 Family and Non-Family Firms (Non-Mining Group)

The significant findings for the non-mining group are that both family and non-family firms with higher retained ownership, outperformed firms with lower retained ownership in Year 0 across all measures of operating performance. Additionally, non-family firms with higher retained ownership outperformed their lower ownership counterparts in Year +2 across all measures. However, the above results were only statistically significant for family firms in Year 0 for JKROA ($Z = -2.276$, $p < .05$) and STROA ($Z = -2.336$, $p < .05$). Thus, these findings only provide weak support for agency theoretic perspectives regarding the performance of higher (lower) retained ownership firms.

8.4 Operating Performance and Firm Age

Consistent with the approach adopted in Balatbat (2001), the mean and median results of operating performance are compared between firms with different age levels. However, unlike the analysis of operating performance and fractional interest in section 8.3 above, there are two dichotomous classification levels (i.e., a cut-off point) used to delineate type of firm; in this case established and younger firms. As explained in Chapter 5, the cut-off point for established firms is the upper quartile of firm age (i.e., the period of time in years since establishment), whereas for younger firms, the cut-off point is the lower quartile of firm age.

The following hypotheses will be tested in this section;

> $H_{14(a)}$: *Established IPO firms outperform younger IPO firms in the long-term, and*
>
> $H_{14(b)}$: *Established Family IPO firms outperform established non-family firms in the long-term.*

8.4.1 Results - Operating Performance and Firm Age

Table 8.3 Panel A and B, show the operating performance results by firm age for established firms compared with younger firms for all observations, for family and non-family firms and for family and non-family firms within the non-mining group. Results of significance testing for mean values using *t-statistics* are reported and in cases where the number of observations violates statistical assumptions, significance testing of the median is also shown using non-parametric *Z*-scores and *p*-values (i.e., using Mann-Whitney *U* tests).

Table 8.4: Operating Performance and Age – All Observations, Family and Non-Family Firms and Family and Non-Family (Non-Mining Group) – Panel A: Years -1 & 0*

Panel A: Year -1 and 0																				
	Year -1										**Year 0**									
Variable	**Mean**						**Median**				**Mean**						**Median**			
(& Grouping)	**n**	**< .25**	**n**	**> .75**	**t stat**	***p* value#**	**< .25**	**> .75**	**MWU Z**	***p* value#**	**n**	**< .25**	**n**	**> .75**	**t stat**	***p* value#**	**< .25**	**> .75**	**MWU Z**	***p* value#**
JKROA																				
All Observ.	25	-0.022	84	0.117	-1.986	**0.050**	0.040	0.070	-1.471	0.141	86	-0.368	130	0.051	-1.113	0.269	0.010	0.070	-3.814	**0.000**
F & NF																				
- Family	6	0.150	19	0.136	0.095	0.925	0.135	0.085	-0.510	0.610	16	-0.085	28	0.029	-1.352	0.184	0.025	0.065	-1.772	0.076
- N Family	19	-0.076	65	0.111	-2.380	**0.020**	0.010	0.070	-1.926	0.054	70	-0.433	102	0.057	-1.060	0.293	0.010	0.070	-3.432	**0.001**
Non-Mining																				
- Family	6	0.150	18	0.067	0.959	0.348	0.135	0.085	-0.735	0.462	14	-0.098	26	0.044	-1.550	0.129	0.025	0.070	-2.073	**0.038**
- N Family	16	-0.061	56	0.138	-2.249	**0.028**	0.025	0.100	-1.979	**0.048**	52	0.056	86	0.070	-0.289	0.773	0.035	0.080	-2.497	**0.013**
JKCFOA																				
All Observ.	22	-0.097	81	0.073	-2.339	**0.021**	0.015	0.030	-1.607	0.108	84	-0.432	130	-0.015	-1.081	0.283	-0.010	0.020	-2.958	**0.003**
F & NF																				
- Family	4	0.030	17	0.087	-0.281	0.782	0.000	0.045	-0.583	0.560	15	-0.141	28	-0.021	-1.178	0.246	0.000	0.025	-1.480	0.139
- N Family	18	-0.125	64	0.070	-1.943	0.066	0.015	0.030	-1.386	0.166	69	-0.495	102	0.013	-1.027	0.308	-0.010	0.027	-2.563	**0.010**
Non-Mining																				
- Family	4	0.030	16	0.007	0.197	0.846	0.000	0.045	-0.426	0.670	13	-0.162	26	-0.006	-1.409	0.167	0.000	0.030	-1.865	0.062
- N Family	15	-0.116	55	0.094	-1.810	0.088	0.020	0.050	-1.449	0.147	52	-0.008	86	-0.002	-0.110	0.913	0.005	0.040	-1.994	**0.046**
STROA																				
All Observ.	24	-0.032	84	0.109	-2.098	**0.038**	0.060	0.095	-1.616	0.106	86	-0.372	130	0.050	-1.118	0.267	0.015	0.080	-4.096	**0.000**
F & NF																				
- Family	5	0.144	19	0.138	0.038	0.970	0.200	0.120	-0.747	0.455	16	-0.093	28	0.031	-1.464	0.151	0.015	0.070	-2.052	**0.040**
- N Family	19	-0.078	65	0.100	-2.452	**0.016**	0.050	0.090	-1.974	**0.048**	70	-0.435	102	0.055	-1.059	0.293	0.015	0.080	-3.591	**0.000**
Non-Mining																				
- Family	5	0.144	18	0.074	0.781	0.444	0.200	0.120	-0.970	0.332	14	-0.106	26	0.047	-1.668	0.104	0.015	0.070	-2.357	**0.018**
- N Family	16	-0.068	56	0.127	-2.415	**0.018**	0.06	0.100	-2.041	**0.041**	52	0.054	86	0.069	-0.315	0.753	0.045	0.090	-2.764	**0.006**
STCFOA																				
All Observ.	25	0.004	82	0.073	-1.115	0.267	0.010	0.030	-0.679	0.497	85	-0.035	131	0.005	-0.160	0.884	0.000	0.010	-0.802	0.422
F & NF																				
- Family	5	0.110	17	0.036	0.929	0.364	0.080	0.045	-0.306	0.760	15	-0.121	28	-0.018	-1.217	0.231	0.000	0.005	-0.562	0.574
- N Family	20	-0.023	65	0.083	-1.404	0.164	0.010	0.030	-0.680	0.497	70	0.026	103	0.011	0.368	0.713	0.000	0.010	-0.721	0.471
Non-Mining																				
- Family	5	0.110	16	0.039	0.860	0.401	0.080	0.045	-0.174	0.861	13	-0.132	26	-0.011	-0.937	0.351	0.000	0.015	-0.522	0.601
- N Family	17	-0.012	55	0.094	-1.212	0.229	0.010	0.030	-0.466	0.641	52	0.038	87	0.014	0.504	0.615	0.010	0.020	-0.205	0.837

****Appendix 10 provides a summary of statistical significance testing for firm age and operating performance, #Highlighted p values are statistically significant***

Table 8.5: Operating Performance and Age – All Observations, Family and Non-Family Firms and Family and Non-Family (Non-Mining Group) – Panel A: Years +1 & +2*

Panel B: Year +1 and +2

Variable (& Grouping)	Year +1 Mean n	< .25	n	> .75	t stat	p value#	Median < .25	> .75	MWU Z	p value#
JKROA										
All Observ.	76	0.036	109	0.098	-1.712	0.089	0.080	0.110	-1.942	0.052
F & NF										
- Family	14	-0.161	25	0.074	-1.344	0.200	0.080	0.080	-1.173	0.241
- N Family	60	0.081	84	0.105	-0.858	0.393	0.080	0.110	-1.636	0.102
Non-Mining										
- Family	14	-0.161	24	0.078	1.367	0.193	0.080	0.085	-1.303	0.192
- N Family	53	0.090	76	0.103	-0.413	0.680	0.090	0.110	-1.006	0.314
JKCFOA										
All Observ.	72	0.072	102	0.029	-1.993	0.049	0.010	0.045	-2.371	0.018
F & NF										
- Family	14	-0.259	23	0.027	-1.386	0.188	0.010	0.040	-1.598	0.110
- N Family	57	-0.023	79	0.029	-1.371	0.173	0.010	0.050	-1.792	0.073
Non-Mining										
- Family	14	-0.259	22	0.030	-1.401	0.183	0.010	0.050	-1.689	0.091
- N Family	50	-0.022	72	0.037	-1.437	0.153	0.020	0.060	-1.534	0.125
STROA										
All Observ.	76	0.029	103	0.091	-1.668	0.097	0.090	0.100	-1.847	0.065
F & NF										
- Family	14	-0.174	25	0.072	-1.363	0.195	0.075	0.090	-1.495	0.135
- N Family	60	0.073	83	0.097	-0.845	0.400	0.090	0.100	-1.556	0.120
Non-Mining										
- Family	14	-0.174	24	0.076	-1.384	0.188	0.075	0.105	-1.621	0.105
- N Family	55	0.077	76	0.097	-0.643	0.522	0.090	0.100	-1.291	0.197
STCFOA										
All Observ.	134	-0.049	134	-0.010	-0.936	0.350	-0.010	0.020	-2.559	0.010
F & NF										
- Family	22	-0.116	27	-0.123	0.034	0.973	0.005	0.020	-0.744	0.457
- N Family	109	-0.037	107	0.018	-1.955	0.052	-0.010	0.020	-2.372	0.018
Non-Mining										
- Family	20	-0.108	25	0.018	-0.997	0.324	0.015	0.020	-0.686	0.493
- N Family	78	-0.017	89	0.034	-1.504	0.135	0.010	0.030	-1.561	0.118

Variable (& Grouping)	Year +2 Mean n	< .25	n	> .75	t stat	p value#	Median < .25	> .75	MWU Z	p value#
JKROA										
All Observ.	120	-0.068	123	0.051	-2.004	0.046	0.025	0.060	-2.439	0.015
F & NF										
- Family	18	-1.184	22	-0.058	-0.789	0.435	0.040	0.055	-1.240	0.215
- N Family	99	-0.049	101	0.075	-1.897	0.059	0.020	0.070	-2.073	0.038
Non-Mining										
- Family	16	-0.145	20	0.001	-0.923	0.363	0.050	0.065	-1.261	0.207
- N Family	69	0.020	83	0.109	-1.264	0.208	0.050	0.080	-1.274	0.203
JKCFOA										
All Observ.	119	-0.144	123	-0.011	-2.218	0.027	-0.040	0.020	-2.437	0.015
F & NF										
- Family	18	-0.249	22	-0.112	-0.869	0.390	-0.065	0.025	-1.524	0.127
- N Family	98	-0.125	101	0.011	-2.079	0.039	-0.015	0.020	-1.882	0.060
Non-Mining										
- Family	16	-0.218	20	-0.055	-1.047	0.303	-0.050	0.040	-1.594	0.111
- N Family	68	-0.070	83	0.052	-1.693	0.093	0.025	0.040	-1.307	0.193
STROA										
All Observ.	120	-0.080	123	0.101	-1.722	0.086	0.030	0.060	-2.423	0.015
F & NF										
- Family	18	-0.187	22	-0.060	-0.802	0.427	0.030	0.060	-1.511	0.131
- N Family	99	-0.062	101	0.136	-1.602	0.111	0.030	0.060	-1.998	0.046
Non-Mining										
- Family	16	-0.148	20	-0.002	-0.933	0.357	0.045	0.065	-1.578	0.114
- N Family	69	0.005	83	0.185	-1.152	0.251	0.050	0.070	1.235	0.217
STCFOA										
All Observ.	119	-0.058	124	0.016	-2.515	0.013	-0.020	0.030	-3.062	0.002
F & NF										
- Family	8	-0.076	22	-0.047	-0.386	0.702	0.025	0.010	-0.231	0.817
- N Family	[illegible]3	-0.055	102	0.030	-2.588	0.011	-0.020	0.030	-3.211	0.001
Non-Mining										
- Family	5	-0.058	20	-0.019	-0.509	0.614	0.030	0.015	-0.080	0.936
- N Family	3	-0.032	84	0.048	-1.825	0.071	0.010	0.040	-2.088	0.037

*Appendix 10 provides a summary of statistical significance testing for firm age and operating performance, #Highlighted p values are statistically significant

8.4.1.1 All Observations

The results of operating performance for established (younger) firms for Years -1, 0, +1 and +2, are as follows, JKROA; 11.7% (-2.2%), 5.1% (-36.8%), 9.8% (3.6%), 5.1% (-6.8%)., JKCFOA; 7.3% (-9.7%), -1.5% (-43.2%), 2.9% (-7.2%), -1.1% (-14.4.%)., STROA; 10.9% (-3.2%), 5.0% (-37.2%), 9.1% (2.9%), 10.1% (-8.0%), and STCFOA; 7.3% (0.4%), 0.5% (-3.5%), -1.0% (-4.9%) and 1.6% (-5.8%).These results show that in all years and across all measures, established firms outperformed younger firms and in the majority of cases the results were statistically significant. For example, JKROA; Years -1, 0 and +2 (t = 1.986, df = 107, p < .05, Z = -3.184, p < .05, and t = -2.004, df = 241, p < .05, JKCFOA; Years 0, +1 and +2, Z = -2.958, p < .01, t = -1.993, df =101, p < .05, and Z = -2.437, p < .05, STROA; Years -1, 0 and +2 (t = -2.098, df = 106, p < .05, Z = -4.096, p < .05, and Z = -2.423, p < .05, and STCFOA; Years +1 and +2 (Z = -2.559, p < .01 and t = 2.515, df = 241, p < .01).

The above results show that for all measures of operating performance, older and more established firms outperformed their younger counterparts in each year from Year -1 through to 0 Year +2. Moreover, there were significant statistical differences in the levels of operating performance between established firms and younger firms in 12, out of a possible 16 tests of observed differences. These findings are consistent with previous studies (Balatbat, 2001; Lee *et al* 1994) and **provide overwhelming support** for hypothesis $H_{14(a)}$ that, *Established IPO firms outperform younger IPO firms in the long-term.*

8.4.1.2 Family and Non-Family Firms

For JKROA, the results for established (younger) firms for Years -1, 0, +1 and +2 are; 13.6% (15.0%), 2.9% (-8.5%), 7.4% (16.1%), -5.8% (-118.4%) for family firms, and 11.1% (-7.6%), 5.7% (-43.3%), 10.5% (8.1%), 7.5% (-4.9%), for non-family firms. These results show that for Years 0, +1 and +2, established family firms outperformed their younger counterparts firms; however, the results were not statistically significant in any of these years. For non-family firms however, established firms outperformed younger firms in all years, i.e., Year -1 through to Years +2, and these results were statistically significant for Year -1, 0 and +2 (t = -2.380, p < .05, df = 82, p < .05, Z = -3.432, p < .01 and Z = -2.073, p < .05). A similar pattern of results emerged for JKCFOA, where in all cases, established firms outperformed younger firms, for example, 8.7% (3.0%), -2.1% (-14.1%), 2.7% (-25.9%), -11.2% (-24.9%) for family firms, and -1; 7.0% (-12.5%), -1.3% (-49.5%), 2.9%

(-2.3%), 1.1% (-12.5%) for non-family firms. Moreover, these results were statistically significant for non-family firms in Years 0 and +2 ($Z = -2.563$, $p < .05$, and $t = -2.079$, $df = 197$, $p < .05$).

The results for established (younger) firms for STROA are, 13.8% (-14.4%), 3.14% (-9.3%), 7.2% (-17.4%), -6.0% (-18.7%) for family firms, and 10.0% (-7.8%), 5.5% (-43.5%), 9.7% (7.3%), 13.6% (-6.2%), for non-family firms. These results show that in Years 0 through to Years +2, established family firms outperformed younger family firms, however the results are only statistically significant for Year 0 ($Z = -2.052$, $p < 0.05$). Moreover, in all years, i.e., Year-1 through to Years +2, established non-family firms outperformed their younger counterparts, and these results were statistically significant for Years 0, and +2 ($Z = -3.591$, $p < .001$, $p < .05$, and $Z = -1.998$, $p < .05$).

For STCFOA, the results show that established firms outperformed younger firms in Years 0, and +2 for family firms; -1.8% (-12.1%, and 4.7% (-7.6%), however, these findings were not statistically significant in any year. Moreover, for non-family firms, established firms outperformed younger firms in Years -1, +1 and +2; 8.3% (-2.3%), 1.8% (-3.7%) and 3.0% (-5.5%), and these results were statistically significant for Years +1 and +2 ($Z = -2.372$, $p < .05$), and $t = 2.588$, $df = 198$, $p < .05$).

An analysis of the results above shows that older and more established firms outperformed their younger counterparts in most cases for family and for non-family firms (family firms; 24 out of 32 cases and non-family firms; 31 out of 32 cases). However, of these cases, only 13 were statistically significant and the majority of these were for non-family firms. Thus, hypothesis 14(b) that *established family IPO firms outperform established non-family IPO firms in the long-term* is **not supported** in this study. Moreover, only 1 case was documented of significant statistical differences (across all measures) where operating performance for younger firms was higher than established firms. On balance, therefore, older and more established firms continued to outperform their younger counterparts even after all observations were divided into family and non-family groups.

8.4.1.3 Family and Non-Family Firms (Non Mining Group)

While Table 8.3 shows all operating performance measures (i.e., JKROA, JKCFOA, STROA and STCFOA) for family firms within the mining group, the results are not reported in this section because of the small number of observations and thus the difficulty of drawing valid statistical inferences from these results. However, operating performance results for established (younger) non-family firms within the non-mining group for Years -1, 0, +1 and +2 are as follows: JKROA; 13.8% (-6.1%), 7.0% (5.6%), 10.3% (9.0%), 10.9% (2.0%), JKCFOA; 9.4%(-11.6%), -0.2% (-0.8%), 3.7% (-2.2%), 5.2% (-7.0%), STROA; 12.7% (-6.8%), 6.9% (5.4%), 9.7% (7.7%), 18.5% (0.5%), and STCFOA; 9.4% (-1.2%), 1.4% (3.8%), 3.4% (-1.7%), and 4.8% (-3.2%).

With only one exception (namely, STCFOA in Year 0), all of the results above show that established non-family firms outperformed their younger counterparts, and several of these findings were statistically significant. For instance, JKROA in Years -1 and 0 ($Z = -1.979$, $p < .05$ and $Z = -2.497$, $p < .05$ respectively), JKCFOA in Year 0 ($Z = -1.994$, $p < .05$), STROA in Years -1 and 0 ($Z = -2.041$, $p < .05$ and $Z = -2.764$, $p < .05$), and STCFOA in Year +2 ($Z = -2.088$, $p < .05$).

After controlling for industry effects, the above results provide further evidence that established firms outperform their younger counterparts.

8.5 Univariate and Multivariate Analysis – Operating Performance

The following sections report the results of univariate and multivariate regressions for the four measures of operating performance (i.e., JKROA, JKCFOA, STROA and STCFOA) as the dependent variables, and fractional interest; (fracowne), age of the firm in years, (ageyr), firm leverage; (lev), and the level of capital expenditure (cpexoa) as independent variables. Using pooled data for all variables (i.e., combined data for Years -1 to +2), the dependent variables are regressed separately on each of the four explanatory variables with mining. The first stage of the analysis uses a simple regression with industry effects, while the second stage uses a factorial ANOVA to assess whether the addition of family and non-family firms (i.e. FB_NFB as a dummy variable) has a moderating effect on the initial results. The final stage of the analysis uses a simple multiple regression to examine the inter-correlation of all the independent variables on all measures of operating performance.

8.5.1 Results – Operating Performance and Fractional Interest

Table 8.6 shows the results of simple regression and factorial ANOVA models for all measures of operating performance as the dependent variable and fractional interest (ownership retention) and mining as independent variables. The results demonstrate that each simple regression model is statistically significant in predicting operating performance (JKROA; Adjusted R^2 = .011, F [df 2, 798] = 5.6, p < .05, JKCFOA; Adjusted R^2 = .010, F [df 2, 769] = 4.8, p < .05, STROA; Adjusted R^2 = .011, F [df 2, 792] = 5.48, p < .05 and STCFOA; Adjusted R^2 = .012, F [df 2, 868] = 6.3, p < .05). The results also show that except for STCFOA, fractional ownership is positively associated with all measures of operating performance, which is generally consistent with the predicted direction. However, while mining is shown as a significant predictor of operating performance, the results demonstrate that fractional interest is not a significant predictor of any measure of the operating performance (JKROA; t = .184, p > .05, JKCFOA; t = .210, p > .05, STROA; t = .209, p > .05 and STCFOA; t = -1.476, p > .05). Therefore, Hypothesis 15(a), that "*Ownership retention is positively associated with the level of operating performance*", **is not supported in this study.** These findings are contrary to agency theory which posits that firms with higher (lower) levels of fractional interest should experience higher (lower) operating performance due to lower (higher) agency costs. Moreover, the findings appear to be anomalous with the significant results of independent t-tests reported earlier which show that firms with high equity retention outperform firms with low equity retention (see section 8.3.1.1 above).

As explained above, a factorial ANOVA was applied to determine if the addition of information regarding family and non-family firms (FB_NFB), moderated prediction of operating performance in addition to those differences attributable to fractional interest and mining. The results in Table 8.6 show that the interacting effects of fractional interest with family firms and mining on all measures of operating performance except for STCFOA, are not statistically significant (JKROA; Adjusted R^2 = .001, F [df 4, 793] = 1.3, p > .05, JKCFOA; Adjusted R^2 = .000, F [df 4, 769] = 1.1, p > .05, and STROA; Adjusted R^2 = .001, F [df 2, 787] = 1.3, p > .05. However, the results for STCFOA with fractional interest, mining and FB_NFB, show a significant model (Adjusted R^2 = .027, F [df 4, 787] = 7.09, p < .05) suggesting that fractional interest with mining is significant in explaining operating performance as measured by STCFOA. Moreover, the interacting effects between the following specific independent variables; fractional interest, mining and family firms on

STCFOA, are also statistically significant ($t = -5.037$, $p < .000$), even at the .001 level (when a more stringent alpha level has been set to overcome a significant statistic for the Levene's Test , i.e. $p < .05$). This result suggests that the addition of the variable FB_NFB appears to have a moderating effect on the relationship between STCFOA and fractional interest with mining, albeit a small effect given that $Eta^2 = .029$. However these results need to be interpreted in the context of the overall results of the factorial ANOVA, which also shows that the sign of the coefficient for fractional interest with mining and FB_NFB is negative and thus inconsistent with the predicted sign. Therefore, notwithstanding the small moderating effects described above, the results **do not support** Hypothesis 15(b) that "*The positive association between ownership retention and the level of operating performance will be moderated by firm type (family/non-family)*". In summary, despite having higher levels of fractional interest than non-family firms, family firms do not fully explain changes in the level of operating performance. Indeed these findings are somewhat anomalous with previous results of independent t-tests which show that family firms with high equity retention outperform non-family firms with high equity retention (see 8.3.1.2).

Table 8.6: Simple Regression and Factorial ANOVA – Operating Performance Measures with Fractional Interest, Mining and FB_NFB

Simple Regression – JKROA & JKCFOA										
			JKROA					**JKCFOA**		
Independent Variables	**B**	**β**	**SE**	**Partial**	***t*-value**	**B**	**β**	**SE**	**Partial**	***t*-value**
Fracowne	0.041	0.007	0.224	0.007	0.184	0.050	0.008	0.239	0.008	0.210
Mining	-0.435	-0.115	0.136	-0.113	-3.207***	-0.425	-0.109	0.142	-0.107	-2.985**
	Multiple R		0.116	*F* value	5.469	Multiple R		0.111	*F* value	4.779
		R^2	0.014	df	2, 798		R^2	0.012	df	2, 769
		Adj R^2	0.011	Sig.	0.004**		Adj R^2	0.010	Sig.	0.009**
Factorial ANOVA										
Parameter Estimates	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**
Fracowne, Mining = 0, FB_NFB = 0	0.248	0.235	0.001	1.057	0.291	0.251	0.251	0.001	1.000	0.318
Fracowne, Mining = 0, FB_NFB = 1	0.071	0.253	0.000	0.281	0.779	0.097	0.269	0.000	0.360	0.719
Fracowne, Mining = 1, FB_NFB = 0	-0.430	0.553	0.001	-0.778	0.437	-0.338	0.5[illegible]0	0.000	-0.583	[illegible].560
Fracowne, Mining = 1, FB_NFB = 1	-0.480	0.451	0.001	-1.063	0.288	-0.475	0.474	0.001	-1.00[illegible]	0.317
Between Subjects Effects (Model)	(SS)	9.783	*F* value	1.288		(SS)	9.001	*F* value	1.088	
	Adj R^2	0.001	df	4, 793		Adj R^2	0.000	df	4, 765	
	Eta^2	0.006	Sig.	0.273		Eta^2	0.005	Sig.	0.361	
Estimated Marginal Means										
Mining – Non-mining	**JKROA Means**		**Moderating Effects**			**JKCFOA Means**		**Moderating Effects**		
Mining	-0.060					-0.134				
Non-Mining	-0.345					-0.403				
Mining and FB_NFB										
Fracowne, Mining = 0, FB_NFB = 0	-0.019		Higher			-0.098		Higher		
Fracowne, Mining = 0, FB_NFB = 1	-0.101		Higher			-0.170		Higher		
Fracowne, Mining = 1, FB_NFB = 0	-0.334		Lower			-0.372		Lower		
Fracowne, Mining = 1, FB_NFB = 1	-0.357		Lower			-0.435		Lower		
Levene's test	*F* = 3.419, df1 = 3, df2 = 794, Sig. = 0.017*					*F* = 3.105, df1 = 3, df2 = 766, Sig. = 0.026*				
Simple Regression – STROA & STCFOA										
			STROA					**STCFOA**		
Independent Variables	**B**	**β**	**SE**	**Partial**	***t*-value**	**B**	**β**	**SE**	**Partial**	***t*-value**
Fracowne	0.047	0.007	0.224	0.007	0.209	-0.082	-0.051	0.056	-0.050	-1.476
Mining	-0.439	-0.115	0.136	-0.114	-3.216***	-0.108	-0.120	0.031	-0.117	-3.472***
	Multiple R		0.117	*F* value	5.481	Multiple R		0.120	*F* value	6.321
		R^2	0.014	df	2, 792		R^2	0.014	df	2, 868
		Adj R^2	0.011	Sig.	0.004**		Adj R^2	0.012	Sig.	0.002**
Factorial ANOVA										
Parameter Estimates	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**
Fracowne, Mining = 0, FB_NFB = 0	0.257	0.236	0.002	1.088	0.277	-0.013	0.058	0.000	-0.227	0.820
Fracowne, Mining = 0, FB_NFB = 1	0.073	0.255	0.000	0.286	0.775	-0.063	0.062	0.001	-1.026	0.305
Fracowne, Mining = 1, FB_NFB = 0	-0.430	0.556	0.001	-0.774	0.439	-0.623	0.124	0.029	-5.037	0.000***
Fracowne, Mining = 1, FB_NFB = 1	-0.443	0.436	0.001	-1.016	0.310	-0.066	0.104	0.000	-0.631	0.528
Between Subjects Effects (Model)	(SS)	9.748	*F* value	1.274		(SS)	3.486	*F* value	7.090	
	Adj R^2	0.001	df	4, 798		Adj R^2	0.027	df	4, 862	
	Eta^2	0.006	Sig.	0.278		Eta^2	0.032	Sig.	0.000***	
Estimated Marginal Means										
Mining – Non-mining	**STROA Means**		**Moderating Effects**			**STCFOA Means**		**Moderating Effects**		
Mining	-0.068					-0.040				
Non-Mining	-0.349					-0.180				
Mining and FB_NFB										
Fracowne, Mining = 0, FB_NFB = 0	-0.025		Higher			-0.029		Higher		
Fracowne, Mining = 0, FB_NFB = 1	-0.111		Higher			-0.052		Higher		
Fracowne, Mining = 1, FB_NFB = 0	-0.346		Lower			-0.308		Lower		
Fracowne, Mining = 1, FB_NFB = 1	-0.352		Lower			-0.0[illegible]		Lower		
Levene's test	*F* = 3.229, df1 = 3, df2 = 788, Sig. = 0.022*					*F* = 9.941, df1 = 3, df2 = 863, Sig. = 0.000***				

$*p < .05$, $**p < .01$, $***p < .001$

8.5.2 Results – Operating Performance and Firm Age

The principal findings in Tables 8.7 is that for all cases, firm age (with mining) is positively associated with all measures of operating performance, notwithstanding the poor explanatory power of each model (JKROA; Adjusted R^2 = .007, F [df 2, 1470] = 6.2, p < .05, JKCFOA; Adjusted R^2 = .006, F [df 2, 1426] = 5.4, p < .05, STROA; Adjusted R^2 = .007, F [df 2, 1459] = 6.6, p < .05 and STCFOA; Adjusted R^2 = .010, F [df 2, 1641] = 9.1, p < .05). However, while these models are statistically robust, firm age is not a reliable predictor of operating performance (JKROA; t = 1.120, p > .05, JKCFOA; t = 1.016, p > .05, STROA; t = 1.1'7, p > .05 and STCFOA; t = 1.189, p > .05). Thus, despite an overwhelming consistency with the hypothesised sign of the coefficients for firm age, the results **do not support** hypothesis 16(a), that "*Firm age is positively associated with the level of operating performance*". Moreover, these findings are somewhat anomalous with overwhelming evidence above (see section 8.4.1.1) which shows that established IPO firms outperform their younger counter parts.

When a factorial ANOVA with FB_NFB and mining was applied, the results were only statistically significant for STCFOA (Adjusted R^2 = .041, F [df 4, 1463] = 18.59, p < .05) suggesting that firm age with mining is significant in explaining operating performance as measured by STCFOA. Furthermore, the results of the interacting effects between firm age with mining and family firms on STCFOA, are also statistically significant (t = -8.037, p < .000), but with a small size effect (Eta^2 = .039). Thus the addition of the variable FB_NFB appears to have a moderating effect on the relationship between STCFOA and firm age with mining. It is noted however that the sign of the coefficient for firm age with mining and FB_NFB is negative and thus inconsistent with the hypothesized direction. Therefore, despite the small moderating effects between firm age with family firms and mining on STCFOA, the overall results **do not support** Hypothesis 16(b), that "*The positive association between firm age and the level of operating performance will be moderated by firm type*".

Table 8.7: Simple Regression and Factorial ANOVA – Operating Performance Measures with Firm Age, Mining and FB_NFB

Simple Regression – JKROA & JKCFOA										
			JKROA					**JKCFOA**		
Independent Variables	**B**	**β**	**SE**	**Partial**	***t*-value**	**B**	**β**	**SE**	**Partial**	***t*-value**
Age	0.002	0.029	0.002	0.029	1.120	0.002	0.027	0.002	0.027	1.016
Mining	-0.236	-0.084	0.074	-0.083	-3.196***	-0.232	-0.080	0.077	-0.079	-2.997**
	Multiple R		0.092	*F* value	6.207	Multiple R		0.087	*F* value	5.428
		R^2	0.008	df	2, 1470		R^2	0.008	df	2, 1426
		Adj R^2	0.007	Sig.	0.002**		Adj R^2	0.006	Sig.	0.004**
Factorial ANOVA										
Parameter Estimates	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**
Age, Mining = 0, FB_NFB = 0	0.006	0.005	0.001	1.245	0.213	0.007	0.005	0.001	1.273	0.203
Age, Mining = 0, FB_NFB = 1	0.002	0.002	0.001	1.272	0.204	0.002	0.002	0.001	1.219	0.223
Age, Mining = 1, FB_NFB = 0	-0.013	0.022	0.000	-0.562	0.574	-0.010	0.023	0.000	-0.435	0.663
Age, Mining = 1, FB_NFB = 1	0.001	0.006	0.000	0.183	0.855	-0.018	0.007	0.000	-0.259	0.796
Between Subjects Effects (Model)	(SS)	4.110	*F* value	0.813		(SS)	4.422	*F* value	0.813	
	Adj R^2	-0.001	df	4, 765		Adj R^2	-0.001	df	4, 787	
	Eta^2	0.002	Sig.	0.517		Eta^2	0.002	Sig.	0.517	
Estimated Marginal Means										
Mining – Non-mining	**JKROA Means**		**Moderating Effects**			**JKCFOA Means**		**Moderating Effects**		
Mining	-0.040					-0.134				
Non-Mining	-0.137					-0.403				
Mining and FB_NFB										
Age, Mining = 0, FB_NFB = 0	-0.023		Higher			-0.098		Higher		
Age, Mining = 0, FB_NFB = 1	-0.058		Higher			-0.170		Higher		
Age, Mining = 1, FB_NFB = 0	-0.205		Lower			-0.372		Lower		
Age, Mining = 1, FB_NFB = 1	-0.069		Lower			-0.435		Lower		
Levene's test	*F* = 0.697, df1 = 3, df2 = 766, Sig. = 0.554					*F* = 0.667, df1 = 3, df2 = 788, Sig. = 0.572				
Simple Regression – STROA & STCFOA										
			STROA					**STCFOA**		
Independent Variables	**B**	**β**	**SE**	**Partial**	***t*-value**	**B**	**β**	**SE**	**Partial**	***t*-value**
Age	0.002	0.031	0.002	0.031	1.177	0.006	0.029	0.000	0.029	1.189
Mining	-0.247	-0.084	0.077	-0.084	-3.203***	-0.071	-0.097	0.018	-0.097	-3.929***
	Multiple R		0.093	*F* value	6.623	Multiple R		0.105	*F* value	9.173
		R^2	0.009	df	2, 1459		R^2	0.011	df	2, 1641
		Adj R^2	0.007	Sig.	0.002**		Adj R^2	0.010	Sig.	0.000***
Factorial ANOVA										
Parameter Estimates	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**
Age, Mining = 0, FB_NFB = 0	0.006	0.005	0.001	1.246	0.213	0.002	0.001	0.001	1.236	0.216
Age, Mining = 0, FB_NFB = 1	0.003	0.002	0.001	1.364	0.173	0.001	0.000	0.002	1.805	0.071
Age, Mining = 1, FB_NFB = 0	-0.013	0.023	0.000	-0.556	0.57[illegible]	-0.043	0.005	0.039	-8.189	0.000***
Age, Mining = 1, FB_NFB = 1	0.0003	0.0[illegible]	0.000	0.040	0.968	-0.0003	0.002	0.000	-0.208	0.835
Between Subjects Effects (Model)	(SS)	4.722	*F* value	0.875		(SS)	6.730	*F* value	18.519	
	Adj R^2	0.000	df	4, 862		Adj R^2	0.041	df	4, 1463	
	Eta^2	0.002	Sig.	0.478		Eta^2	0.043	Sig.	0.000***	
Estimated Marginal Means										
Mining – Non-mining	**STROA Means**		**Moderating Effects**			**STCFOA Means**		**Moderating Effects**		
Mining	-0.068					-0.040				
Non-Mining	-0.349					-0.180				
Mining and FB_NFB										
Age, Mining = 0, FB_NFB = 0	-0.025		Higher			-0.029		Higher		
Age, Mining = 0, FB_NFB = 1	-0.111		Higher			-0.052		Higher		
Age, Mining = 1, FB_NFB = 0	-0.346		Lower			-0.308		Lower		
Age, Mining = 1, FB_NFB = 1	-0.352		Lower			-0.053		Lower		
Levene's test	*F* = 0.626, df1 = 3, df2 = 863, Sig. = 0.598					*F* = 13.845, df1 = 3, df2 = 1464, Sig. = 0.000***				

$^*p < .05$, $^{**}p < .01$, $^{***}p < .001$

8.5.3 Results – Operating Performance and Leverage

There are several major findings shown in Table 8.8, including statistically significant models using simple regression for all measures of operating performance with firm leverage and mining (JKROA; Adjusted R^2 = .449, F [df 2, 1496] = 607.9, p < .05, JKCFOA; Adjusted R^2 = .443, F [df 2, 1453] = 557.9, p < .05, STROA; Adjusted R^2 = .420, F [df 2, 1486] 539.3 = , p < .05 and STCFOA; Adjusted R^2 = .019, F [df 2, 1668] = 17.4, p < .05). Interestingly also, the explanatory power of the models is strong, explaining greater than 42% of the variance in all models except STCFOA, which only explains approximately 2% of the variance. Moreover both leverage and mining are significant variables in predicting all measures of operating performance, and the sign of the coefficients for leverage are all in the hypothesised direction. These findings provide significant evidence of a negative relationship between leverage and operating performance suggesting that more highly levered firms underperform compared to firms with lower levels of debt. Thus Hypothesis 17(a) that "*Firm leverage is negatively associated with operating performance*" **is supported in this study.**

The results also show statistically significant models using factorial ANOVA for all measures of operating performance with firm leverage and mining together with FB_ NFB added (JKROA; Adjusted R^2 = .563, F [df 2, 1486] = 480.3, p < .05, JKCFOA; Adjusted R^2 = .541, F [df 2, 1444] = 427.2, p < .05, STROA; Adjusted R^2 = .530, F [df 2, 1476] = 418.7, p < .05 and STCFOA; Adjusted R^2 = .076, F [df 2, 1658] = 35.02, p < .05). These results show strong explanatory power for all models except for STCFOA, but moreover the explanatory power is considerably higher when compared with each of the corresponding simple regression models (i.e., without FB_NFB added). This suggests that the addition of information regarding family and non-family firms (FB_NFB), improves prediction of operating performance, that is, along with influences attributable to firm leverage and mining. The results of the factorial ANOVA further show that the sign of the coefficient for firm leverage with all combinations of independent variables are in the predicted direction. Moreover, the interacting effects of most combinations of independent variables (i.e., firm leverage with/without mining and with/without family firms) are statistically significant with size effects falling primarily within the small to medium range (i.e., Eta^2 between .01 and .06). Interestingly also, for one combination of independent variables (i.e., firm leverage for non-family mining firms) with all measures of operating performance except STCFOA, the size effect was considerable (*Eta*^{2} JKROA; .559, JKCFOA; .537, and STROA; .527). In addition to the size effect of the interaction of different independent variables on operating performance, Table 8.8 also shows the extent of these effects on the mean values of operating performance. For example, the mean values of JKROA with firm leverage for mining and non-mining firms (2.9% and 16.1% respectively) are considerably different compared with mean values of JKROA with firm leverage for mining and non-mining firms with FB_NFB added. For instance for family and non-family mining firms, JKROA is 9.3% and -3.5% respectively, whereas for family and non-family non-mining firms, JKROA is 4.1% and -36.2%. Perhaps of considerable interest here is that all operating returns except for non-family non-mining firms, are appreciably higher after FB_NFB is added to the factorial model. Similar findings are reported for mean values for JKCFOA, STROA and STCFOA. These results provide considerable and significant evidence that family firms have a moderating effect on the relationship between firm leverage and operating performance.

In this study, the extent of indebtedness of a firm is regarded as a proxy for firm quality, i.e., the lower the level of debt, the higher the quality of the firm and thus the higher the level of operating performance. The underlying theme therefore is a negative relationship between firm leverage and operating performance. Moreover, given that family firms are geared to a lesser extent than non-family firms (see Table 6.9, Chapter 6) we would also expect to find that this negative relationship is moderated by the family to the extent that family firms (with mining and leverage considered) outperform non-family firms. The results above not only provide strong support for these themes, but also demonstrate that family firms do indeed outperform non-family firms allowing for mining and leverage. Thus, Hypothesis 17(b), which posits that "*The negative association between firm leverage and the level of operating performance is moderated by firm type (family/non-family)*", **is supported** in this study.

Table 8.8: Simple Regression and Factorial ANOVA – Operating Performance Measures with Leverage, Mining and FB_NFB

Simple Regression – JKROA & JKCFOA										
	JKROA					**JKCFOA**				
Independent Variables	**B**	**β**	**SE**	**Partial**	***t*-value**	**B**	**β**	**SE**	**Partial**	***t*-value**
Leverage	-0.697	-0.664	0.020	-0.666	-34.57***	-0.701	-0.654	0.021	-0.656	-33.13***
Mining	-0.283	-0.100	0.054	-0.134	-5.227	-0.277	-0.096	0.057	-0.126	-4.842***
	Multiple R		0.670	*F* value	607.925	Multiple R		0.659	*F* value	557.687
		R^2	0.448	df	2, 1496		R^2	0.434	df	2, 1453
		Adj R^2	0.448	Sig.	0.000***		Adj R^2	0.433	Sig.	0.000***
Factorial ANOVA										
Parameter Estimates	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**
Leverage, Mining = 0, FB_NFB = 0	-0.042	0.066	0.000	-0.631	0.528	-0.054	0.071	0.000	-0.753	0.452
Leverage, Mining = 0, FB_NFB = 1	-0.295	0.039	0.036	-7.492	0.000***	-0.321	0.042	0.039	-7.641	0.000***
Leverage, Mining = 1, FB_NFB = 0	-0.145	0.049	0.006	-2.942	0.003**	-0.138	0.052	0.005	-2.651	0.008**
Leverage, Mining = 1, FB_NFB = 1	-0.939	0.022	0.559	-43.420	0.000***	-0.940	0.023	0.537	-40.890	0.000***
Between Subjects Effects (Model)	(SS)	1045.548	*F* value	480.327		(SS)	1049.104	*F* value	427.185	
	Adj R^2	0.563	df	4, 1486		Adj R^2	0.541	df	4, 1444	
	Eta^2	0.564	Sig.	0.000***		Eta^2	0.542	Sig.	0.000***	
Estimated Marginal Means										
Mining – Non-mining	**JKROA Means**		**Moderating Effects**			**JKCFOA Means**		**Moderating Effects**		
Mining	0.029					-0.039				
Non-Mining	-0.161					-0.218				
Mining and FB_NFB										
Leverage, Mining = 0, FB_NFB = 0	0.093		Higher			0.029		Higher		
Leverage, Mining = 0, FB_NFB = 1	-0.035		Higher			-0.107		Higher		
Leverage, Mining = 1, FB_NFB = 0	0.041		Higher			-0.014		Higher		
Leverage, Mining = 1, FB_NFB = 1	-0.362		Lower			-0.421		Lower		
Levene's test	*F* = 3.596, df1 = 3, df2 = 1487, Sig. = 0.013*					*F* = 2.206, df1 = 3, df2 = 1445, Sig. = 0.086**				
Simple Regression – STROA & STCFOA										
	STROA					**STCFOA**				
Independent Variables	**B**	**β**	**SE**	**Partial**	***t*-value**	**B**	**β**	**SE**	**Partial**	***t*-value**
Leverage	-0.694	-0.643	0.021	-0.645	-32.54***	-0.030	-0.099	0.007	-0.099	-4.406***
Mining	-0.285	-0.097	0.058	-0.127	-4.935***	-0.079	-0.109	0.018	-0.109	-4.490***
	Multiple R		0.649	*F* value	539.320	Multiple R		0.143	*F* value	17.474
		R^2	0.421	df	2, 1486		R^2	0.021	df	2, 1668
		Adj R^2	0.420	Sig.	0.000***		Adj R^2	0.019	Sig.	0.000***
Factorial ANOVA										
Parameter Estimates	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**
Leverage, Mining = 0, FB_NFB = 0	-0.021	0.071	0.000	-0.290	0.772	-0.064	0.026	0.004	2.451	0.014**
Leverage, Mining = 0, FB_NFB = 1	-0.295	0.042	0.032	-6.982	0.000***	-0.019	0.015	0.001	-1.256	0.209
Leverage, Mining = 1, FB_NFB = 0	-0.139	0.053	0.005	-2.637	0.008**	-0.223	0.020	0.073	-11.438	0.000***
Leverage, Mining = 1, FB_NFB = 1	-0.938	0.023	0.527	-40.535	0.000***	0.0002	0.009	0.000	0.020	0.984
Between Subjects Effects (Model)	(SS)	1044.810	*F* value	418.699		(SS)	12.133	*F* value	35.032	
	Adj R^2	0.530	df	4, 1476		Adj R^2	0.076	df	4, 1658	
	Eta^2	0.532	Sig.	0.000***		Eta^2	0.078	Sig.	0.000***	
Estimated Marginal Means										
Mining – Non-mining	**STROA Means**		**Moderating Effects**			**STCFOA Means**		**Moderating Effects**		
Mining	0.029					-0.016				
Non-Mining	-0.165					-0.078				
Mining and FB_NFB										
Leverage, Mining = 0, FB_NFB = 0	0.098		Higher			0.003		Higher		
Leverage, Mining = 0, FB_NFB = 1	-0.041		Higher			-0.036		Higher		
Leverage, Mining = 1, FB_NFB = 0	0.038		Higher			-0.130		Lower		
Leverage, Mining = 1, FB_NFB = 1	-0.368		Lower			-0.027		Lower		
Levene's test	*F* = 3.270, df1 = 3, df2 = 1477, Sig. = 0.021**					*F* = 8.517, df1 = 3, df2 = 1659, Sig. = 0.000***				

$^*p < .05$, $^{**}p < .01$, $^{***}p < .001$

8.5.4 Results – Operating Performance and Capital Expenditure

Table 8.9 provides the results of simple regression and factorial ANOVA models using pooled data for all measures of operating performance as dependent variables with capital expenditure, mining and FB_NFB as independent variables. The results demonstrate statistically significant models using both simple regression and factorial ANOVA for all measures of operating performance with firm leverage and mining (using simple regression - JKROA; Adjusted $R^2 = .025$, F [df 2, 1458] = 19.6, $p < .05$, JKCFOA; Adjusted $R^2 = .067$, F [df 2, 1453] = 53.2, $p < .05$, STROA; Adjusted $R^2 = .027$, F [df 2, 1444] = 20.8, $p < .05$ and STCFOA; Adjusted $R^2 = .019$, F [df 2, 1626] = 16.5, $p < .05$) and firm leverage and mining with FB_NFB added (using factorial ANOVA - (JKROA; Adjusted $R^2 = .022$, F [df 2, 1449] = 9.26, $p < .05$, JKCFOA; Adjusted $R^2 = .064$, F [df 2, 1444] = 25.9, $p < .05$, STROA; Adjusted $R^2 = .024$, F [df 2, 1435, $p < .05$ and STCFOA; Adjusted $R^2 = .029$, F [df 2, 1616] = 13.4, $p < .05$). The results also show that capital expenditure with mining is a significant variable in predicting all measures of operating performance using simple regression (JKROA; $t = -5.313$, $p < .05$, JKCFOA; $t = -9.776$, $p < .05$, STROA; $t = -5.503$, $p < .05$ and STCFOA; $t = -3.908$, $p < .05$). Moreover, the results of the factorial ANOVA demonstrate that the interacting effects of capital expenditure with mining and FB_NFB on JKCFOA and STCFOA, are also statistically significant in most combinations of independent variables.

Notwithstanding these findings however, the sign of the coefficients for capital expenditure in all models either using simple regression or factorial ANOVA, is negative which is inconsistent with the hypothesised direction. Thus given these findings, the following hypotheses **cannot be supported**: Hypothesis 18(a), that "*Capital expenditure is positively associated with the level of operating performance*", and Hypothesis 18(b), that "*The positive association between capital expenditure and the level of operating performance is moderated by firm type (family/non-family)*".

One possible reason for these inconsistent results may the use of the capital expenditure variable (i.e., capital expenditure divided by assets) as a proxy for growth. It may be that the first few years of operations for start-firms are characterised by large amounts of capital expenditure required to establish the enterprise and concomitant losses during the start-up period. Indeed there is evidence of a large number of start-up firms in the current study. Perhaps a future study could examine the relationship between capital expenditure and operating performance excluding start-up firms. Alternatively a different growth proxy could be used instead of capital expenditure, e.g. gross sales.

Table 8.9: Simple Regression and Factorial ANOVA – Operating Performance Measures with Capital Expenditure (CPEXOA), Mining and FB_NFB

Simple Regression – JKROA & JKCFOA										
	JKROA					JKCFOA				
Independent Variables	**B**	**β**	**SE**	**Partial**	***t*-value**	**B**	**β**	**SE**	**Partial**	***t*-value**
CPEXOA	-1.169	-0.137	0.220	-0.138	-5.313***	-2.176	-0.248	0.223	-0.248	-9.776***
Mining	-0.246	-0.087	0.073	-0.087	-3.353***	-0.245	-0.085	0.073	-0.087	-3.338***
	Multiple R		0.162	*F* value	19.605	Multiple R		0.261	*F* value	53.188
		R^2	0.026	df	2, 1458		R^2	0.068	df	2, 1453
		Adj R^2	0.025	Sig.	0.000***		Adj R^2	0.067	Sig.	0.000***
Factorial ANOVA										
Parameter Estimates	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**
CPEXOA, Mining = 0, FB_NFB = 0	-0.448	0.514	0.001	-0.872	0.384	-1.406	0.552	0.004	-2.550	0.011**
CPEXOA, Mining = 0, FB_NFB = 1	-1.584	0.261	0.025	-6.066	0.000***	-2.581	0.262	0.063	-9.866	0.000***
CPEXOA, Mining = 1, FB_NFB = 0	-0.973	1.836	0.000	-0.530	0.596	-1.967	1.839	0.001	-1.070	0.285
CPEXOA, Mining = 1, FB_NFB = 1	-0.263	0.492	0.000	-0.535	0.593	-1.262	0.493	0.005	-2.558	0.011**
Between Subjects Effects (Model)	(SS)	46.179	*F* value	9.261		(SS)	129.680	*F* value	25.922	
	Adj R^2	0.022	df	4, 1449		Adj R^2	0.064	df	4, 1444	
	Eta^2	0.025	Sig.	0.000***		Eta^2	0.067	Sig.	0.000***	
Estimated Marginal Means										
Mining – Non-mining	**JKROA Means**		**Moderating Effects**			**JKCFOA Means**		**Moderating Effects**		
Mining	-0.049					-0.114				
Non-Mining	-0.023					-0.089				
Mining and FB_NFB										
CPEXOA, Mining = 0, FB_NFB = 0	-0.011		Higher			-0.075		Higher		
CPEXOA, Mining = 0, FB_NFB = 1	-0.087		Lower			-0.153		Lower		
CPEXOA, Mining = 1, FB_NFB = 0	-0.046		Higher			-0.113		Higher		
CPEXOA, Mining = 1, FB_NFB = 1	0.001		Higher			-0.066		Higher		
Levene's test	F = 0.976, df1 = 3, df2 = 1450, Sig. = 0.403					F = 0.970, df1 = 3, df2 = 1445, Sig. = 0.406				

Simple Regression – STROA & STCFOA										
	STROA					STCFOA				
Independent Variables	**B**	**β**	**SE**	**Partial**	***t*-value**	**B**	**β**	**SE**	**Partial**	***t*-value**
CPEXOA	-1.247	-0.143	0.227	-0.143	-5.503***	-0.220	-0.096	0.056	-0.096	-3.908***
Mining	-0.257	-0.087	0.076	-0.088	-3.360***	-0.076	-0.105	0.018	-0.106	-4.278***
	Multiple R		0.167	*F* value	20.758	Multiple R		0.141	*F* value	16.488
		R^2	0.028	df	2, 1444		R^2	0.020	df	2, 1626
		Adj R^2	0.027	Sig.	0.000***		Adj R^2	0.019	Sig.	0.000***
Factorial ANOVA										
Parameter Estimates	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**	**B**	**SE**	**Eta^2**	***t*-value**	**Sig.**
CPEXOA, Mining = 0, FB_NFB = 0	-0.510	0.534	0.001	-0.956	0.339	-0.326	0.136	0.004	-2.395	0.017**
CPEXOA, Mining = 0, FB_NFB = 1	-1.688	0.270	0.027	-6.254	0.000***	-0.176	0.066	0.004	-2.665	0.008**
CPEXOA, Mining = 1, FB_NFB = 0	-1.007	1.898	0.000	-0.531	0.596	-2.524	0.392	0.025	-6.445	0.000***
CPEXOA, Mining = 1, FB_NFB = 1	-0.328	0.496	0.000	-0.661	0.509	-0.115	0.123	0.001	-0.928	0.353
Between Subjects Effects (Model)	(SS)	52.521	*F* value	9.858		(SS)	4.744	*F* value	13.040	
	Adj R^2	0.024	df	4, 1435		Adj R^2	0.029	df	4, 1616	
	Eta^2	0.027	Sig.	0.000***		Eta^2	0.031	Sig.	0.000***	
Estimated Marginal Means										
Mining – Non-mining	**STROA Means**		**Moderating Effects**			**STCFOA Means**		**Moderating Effects**		
Mining	-0.054					-0.031				
Non-Mining	-0.024					-0.103				
Mining and FB_NFB										
Higher	-0.014		Higher			-0.036		Higher		
Lower	-0.093		Lower			-0.026		Higher		
Higher	-0.047		Higher			-0.184		Lower		
Higher	-0.002		Higher			-0.022		Higher		
Levene's test	F = 0.951, df1 = 3, df2 = 1436, Sig. = 0.415					F = 10.939, df1 = 3, df2 1617, Sig. = 0.000***				

*$p < .05$, **$p < .01$, ***$p < .001$

8.5.5 Results – Operating Performance and Fractional Interest, Age. Leverage, Capital Expenditure, Mining and FB_NFB)

Table 8.10 shows the results of a multiple regression using pooled data for all measures of operating performance as the dependent variables, and fractional interest, firm age, firm leverage, capital expenditure with mining and FB_NFB as independent variables. The results show significant regression models with the inter-correlation of the variables exhibiting strong explanatory power in all cases except STCFOA (JKROA; Adjusted R^2 = .652, F [df 6, 578] = 239.2, $p < .05$, JKCFOA; Adjusted R^2 = .607, F [df 6, 753] = 257.7, $p <$ .05, STROA; Adjusted R^2 = .649, F [df 6, 753] = 234.5, $p < .05$ and STCFOA; Adjusted R^2 = .065, F [df 2, 829] = 10.7, $p < .05$). Indeed in all models except STFCOA, the interdependence of all the variables acting together, account for more than 60% of the variance in operating performance. Moreover, except for firm age and fractional interest, all other independent variables are significant predictors of operating performance, for instance firm leverage (JKROA; t = -35.76, $p < .05$, JKCFOA; t = -35.70, $p < .05$, STROA; t = -35.37, $p < .05$ and STCFOA; t = -2.626, $p < .05$), capital expenditure (JKROA; t = -11.31, $p < .05$, JKCFOA; t = -15.61, $p < .05$, STROA; t = -11.30, $p < .05$ and STCFOA; t = -6.654, $p < .05$), mining (JKROA; t = -3.883, $p < .05$, JKCFOA; t = -3.828, $p < .05$, STROA; t = -3.610, $p < .05$ and STCFOA; t = -3.553, $p < .05$) and FB_NFB (JKROA; t = -2.166, $p < .05$, JKCFOA; t = -2.023, $p < .05$, and STROA; t = -2.251, but note STCFOA not significant t = -1.076, $p < .05$). Interestingly, the non-significance of fractional interest and firm age as reliable predictors of operating performance is consistent with the univariate results above, although the sign of the coefficient for fractional interest is not consistent with the hypothesised direction. The results for leverage and capital expenditure also show affinity with the univariate results above.

These are significant findings in the study because they provide strong evidence of an association between variables known to influence operating performance, namely firm leverage and capital expenditure (albeit in a direction opposite to the predicted sign). Moreover, the results provide evidence that the addition of family firms together with the combined effect of other independent variables, also explain the variance in operating performance.

Table 8.10: Multiple Regression – Operating Performance Measures with Mining, FB_NFB, Fractional Interest, Firm Age, Leverage and Capital Expenditure

Simple Multiple Regression – JKROA & JKCFOA										
	JKROA					JKCFOA				
Independent Variables	B	β	SE	Partial	t-value	B	β	SE	Partial	t-value
Fracowne	-0.188	-0.030	0.144	-0.047	-1.303	-0.170	0.145	-0.026	-0.043	-1.168
Age	0.002	0.024	0.002	0.041	1.129	0.002	0.002	0.024	0.042	1.151
Leverage	-0.805	-0.765	0.023	-0.792	-35.76***	-0.805	0.023	-0.746	-0.793	-35.70***
CPEXOA	-2.598	-0.242	0.230	-0.380	-11.31***	-3.661	0.235	-0.326	-0.494	-15.61***
Mining	-0.323	-0.085	0.083	-0.140	-3.883***	-0.319	0.083	-0.082	-0.138	-3.828***
FB_NFB	-0.141	-0.048	0.065	-0.078	-2.166*	-0.133	0.066	-0.044	-0.74	-2.023*
	Multiple R		0.809	F value	239.245	Multiple R		0.820	F value	257.675
		R^2	0.654	df	6, 758		R^2	0.672	df	6, 753
		Adj R^2	0.652	Sig.	0.000***		Adj R^2	0.670	Sig.	0.000***
Simple Regression – STROA & STCFOA										
	STROA					STCFOA				
Independent Variables	B	β	SE	Partial	t-value	B	β	SE	Partial	t-value
Fracowne	-0.203	-0.032	0.145	-0.051	-1.394	-0.073	-0.045	0.058	-0.044	-1.270
Age	0.002	0.025	0.002	0.042	1.153	-0.0007	-0.028	0.001	-0.029	-0.829
Leverage	-0.803	-0.762	0.023	-0.790	-35.37***	-0.025	-0.088	0.009	-0.091	-2.626**
CPEXOA	-2.594	-0.243	0.230	-0.381	-11.30***	-0.597	-0.223	0.090	-0.225	-6.654***
Mining	-0.304	-0.079	0.084	-0.130	-3.61***	-0.112	-0.122	0.031	-0.122	-3.553***
FB_BFB	-0.148	-0.051	0.066	-0.082	-2.251*	0.028	0.038	0.026	0.037	1.076
	Multiple R		0.807	F value	234.480	Multiple R		0.268	F value	10.705
		R^2	0.651	df	6, 753		R^2	0.072	df	6, 829
		Adj R^2	0.649	Sig.	0.000***		Adj R^2	0.065	Sig.	0.000***

*$p < .05$, **$p < .01$, ***$p < .001$

8.6 Summary and Conclusions

A number of themes have emerged from the analysis of the results in this chapter and have been summarized within the relevant sections above. The principal findings however, are stated as follows; 1) both family and non-family firms experience a decline in post-listing operating performance relative to pre-listing levels, 2) non-family firms outperformed family firms in the post-listing period, 3) established firms outperformed younger firms in the post-listing period, 4) established family firms do not outperform established non-family firms, 5) firms with higher retained ownership outperformed firms with lower retained ownership, 6) family firms with higher retained ownership do not outperform non-family firms with higher retained ownership, 7) fractional ownership is positively associated with operating performance but is not a reliable predictor of operating performance, and the positive association between fractional interest and operating performance is not moderated by firm type, 8) firm age is positively associated with operating performance but is not a reliable predictor of operating performance, and the positive association between firm age and operating performance is not moderated by firm type, 9)) firm leverage is negatively associated with operating performance and this negative association is moderated by firm type, 10) capital expenditure is negatively associated with operating performance (which is inconsistent with the hypothesized direction) and is a reliable predictor of operating performance, and the negative association between capital expenditure and operating performance is not moderated by firm type, 11) mining is a reliable predictor of operating performance, and 12) firm type (i.e. family and non-family) is a reliable predictor of operating performance, 13) the variance in operating performance of IPO firms can be substantially explained by the inter-correlation of several independent variables, including firm type (family and non-family), industry effects (mining), firm leverage, capital expenditure, fractional interest and firm age.

Chapter 9: Discussion, Conclusions, Implications and Recommendations

9.1 Introduction

This study empirically examined the initial price performance and long-term aftermarket operating performance of family and non-family controlled IPO companies that listed on the Australian Stock Exchange between the periods 1 January 1988 and 31 December 1999. Given the paucity of Australian studies on initial and long-term performance of IPOs, and the increasing recognition of the significance of family businesses in modern economies, this study provides a further contribution to the understanding of family controlled enterprises.

In studies involving comparisons of family and non-family business, the ability to delineate and differentiate between family and non-family business is paramount. This study therefore has recognised the importance of developing a robust operational and reliable definition of family business. Accordingly, one of the prerequisite objectives of the study was to develop a definition of family business sufficiently robust for capital markets research purposes.

The study provided a comprehensive discussion and review of the 'going public' process in the Australian context (Chapter 2), and a detailed review of the literature encompassing family business, agency theory, initial underpricing of IPO firms, and the long-term operating performance of IPO firms (Chapter 3). The study then outlined the various hypotheses (Chapter 4), followed by an overview of the research procedures (Chapter 5). A profile of companies was then provided (Chapter 6), followed by a detailed analysis of results (Chapters 7 and 8). The study closes with a discussion on the outcomes and conclusions of the study, in which potential implications and recommendations for further research are outlined.

9.2 Definition of Family Business

Against a background of definitional diversity in the literature, this study provides a theoretical and practical basis for developing a definition of family business. By combining common themes (within existing definitions), with authoritative definitions and explanations in accounting standards and legislation, an operational definition of family business is derived. This outcome adds a new dimension to the family business and finance literatures and has the potential to contribute significantly to future research in these fields. For instance, it may assist in addressing the urgent need for definitional consensus (Wortman, 1995; Shanker & Astrachan, 1996), by providing the foundation from which a generally accepted definition of family business can be developed. This outcome may in turn provide valuable information which could assist in validating statistics (Shanker & Astrachan, 1996) and other data in existing or future studies, which draw comparisons between family and non-family businesses.

Recent studies have shown that family firms are emerging as significant contributors not only to Gross Domestic Product (Sharma et al., 1996, Shanker & Astrachan, 1996; Smyrnios et al., 1998) but also to capital markets generally (Burch, 1972; McConaughy, 1994; Monsen et al., 1968; Radice, 1971; Daily & Dollinger, 1992). It is also evident from the literature that ownership and control are significant variables that influence managerial incentives and thus impact on firm performance. Jensen and Meckling (1976) and Fama and Jensen (1983) have established that the dynamics underlying family relationships reduce agency costs and improve efficiency. Numerous articles have found an association between concentrated ownership and control, and firm performance (Morck et al., 1988; Kim & Lyn 1988; Wruck 1989; McConnell & Servaes 1990; Chen et al., 1991; McConaughy, 1994). Given these findings, and that family businesses are typically characterized by high levels of ownership and control, there is extensive scope for future studies to further examine performance differences between family and non-family enterprises, listed on stock exchanges. In this regard, the ability to accurately differentiate between family and non-family businesses is of importance in further advancing knowledge in this area.

9.3 Initial Underpricing

Consistent with prior international and Australian studies, the study provides evidence of significant initial underpricing of Australian IPO firms between the periods 1988 to 1999. Abnormal returns for the first day of trading were found to be 32.16%. These were generated substantially on the first day of trading, and returns in any of the subsequent days for a period of 20 days post-listing, were not statistically significant. Thus hypothesis 1, that Australian IPO firms are underpriced, is empirically supported in this study.

After allowing for specific sector influences (mining in particular), the study found significant statistical differences in returns for family and non-family firms, with 15.54% initial underpricing on the first day of trading for family firms compared with 36.12% for non-family firms. Given that family firms have higher levels of fractional interest, the signalling themes adopted in this study suggest that family firms should have higher levels of underpricing than non-family firms. The above findings however, are anomalous with these themes and moreover, may indicate that family firms do not engage in *signalling* by intentionally underpricing initial returns. Notwithstanding, there may be a number of possible explanations for these findings. Sum (1991) for instance, argues that a higher level of equity retained by owners-entrepreneurs signals a higher firm value and a lower level of *ex ante* uncertainty with less underpricing. This perspective is also supported by agency theory which posits that less diffuse ownership and control structures (which typically characterise family firms) provide signals of quality and thus less uncertainty and more stable investment opportunities. In both of these perspectives the important underlying issue is the market's perception of risk, and thus the above results could plausibly be explained by the manifestation of the risk/return phenomenon, which is well documented in the finance literature. Indeed, this argument can be supported by the results in the present study, which provide empirical evidence of a positive and significant association between firm risk and the level of market adjusted underpricing. Moreover, when a number of the independent variables in the study were regressed with market adjusted underpricing using a WLS regression model; fractional interest was found to be negatively associated with underpricing (and thus inconsistent with signalling theory).

On a practical level, another plausible explanation for the above findings could be that family firm entrepreneurs use IPOs as an exit mechanism, and thus seek to obtain maximum value in the 'first-time' issue of shares to the public since there will be little interest, if any, in subsequent seasoned issues. Accordingly, the issue price will be set closer to the *true value* of the firm thus leaving less money on the table for investors.

There are a number of potential implications for the above findings;

- Given the significant differences in underpricing between family and non-family firms (controlling for industry), the results suggest that capital market participants do in fact differentiate between family and non-family firms in pricing IPO stocks.

- Since family firms are considerably less underpriced than non-family firms, the findings may be of particular significance for family firms intending to 'go public', since the loss of wealth for issuers (i.e. attributable to underpricing) is considerably less for family firms than non-family firms.

- If family firms are considerably less underpriced than non-family firms, then investors seeking stag profits may do better to invest in non-family IPO firms in the immediate term.

The industry-adjusted underpricing results also provide evidence of an efficient after-market, at least for the first 20 days of trading post-listing for all IPO groups tested. Thus the cumulative abnormal residuals for all IPO firms, for family and non-family IPO firms, and for mining and non-mining IPO firms, were not significantly different from zero in any day after the first day of listing up to and including day 20. This finding provides support to numerous other studies and is consistent with accepted theory that most abnormal returns accrue on the first day of trading. It is also noted that the variability of cumulative returns for the 20-day period post-listing, is significantly different between family and non-family firms within the non-mining group. For instance, the standard deviation of daily returns for family firms was 3.5% compared with 8.1% for non-family firms, indicating that non-family IPO shares were considerably more volatile than family firms in the aftermarket period. This is a significant finding and lends support to the discussion above that the market may perceive family IPO firms as being more stable and thus less risky investments compared with the non-family alternative.

9.3.1 Factors known to Influence Firm Value & Initial Underpricing

To explain differences in the level of underpricing between family and non-family IPO firms, a significant component of the study examined whether; 1) there was an association between the level of initial underpricing, and a variety of factors known to influence underpricing (particularly attributes specific to the firm, and other exogenous factors such as market cycles and changes to regulatory regimes impacting on IPO firms) and, 2), whether the association between these factors and initial underpricing was moderated by firm type;

family or non-family. Univariate and multivariate regressions were conducted between the dependent variable and the various independent variables to test prevailing theories against the data in this study.

9.3.1.1 Firm Factors

Firm value and fractional interest – After allowing for industry effects, the results show a positive and significant association between firm value and fractional interest for both family and non-family firms. Moreover, this association is moderated by firm type (family and non-family). This would indicate therefore that family and non-family IPO firms use fractional interest to signal the value of the firm. These findings provide empirical support for Leland and Pyle's (1977) signalling model and the findings of several other studies including How and Low (1993).

Firm value and underpricing – The existence of a second-signal model, which extends the Leland and Pyle (1977) model and posits that an additional signal explains variations in firm value (Allen & Faulhaber, 1989, and Hwang, 1986), is supported by the evidence in this study. Indeed, the results show a positive and significant association between firm value and market adjusted underpricing for both family and non-family firms after allowing for industry effects. This association is also moderated by firm type (family and non-family firms).

Fractional Interest and underpricing – The extension of the above signaling models, i.e. where underpricing signals firm value as proxied by fractional interest, is also supported in this study. The results show a positive and significant association between fractional interest and market adjusted underpricing for both family and non-family firms. Moreover, this association is moderated by firm type (family and non-family firms).

Perhaps the above findings thus far can be best summarized as follow;

- Fractional interest is a significant predictor of firm value, and
- Underpricing is a significant predictor of firm value as measured either by the market capitalisation of total ordinary shares issued after the IPO issue, or by the level of fractional interest held by insider holdings.

Firm Age - Firm age was found to be negatively associated with initial underpricing for both family and non-family firms, and was moderated by the presence of firm type. This finding is consistent with the underlying theory that older and more established firms are perceived to be less risky than their younger counterparts. Thus the market will price issues more conservatively for older firms than younger firms. However, the results were not statistically significant for both family and non-family firms after allowing for industry effects.

Underwriter Prestige -- A negative association was reported between underwriter prestige and initial underpricing for both family and non-family firms. This finding is consistent with existing theories which posit that prestigious underwriters provide signals of quality, lowering the uncertainty associated with the issue and hence resulting in lower underpricing. However the results were not statistically significant.

Auditor Prestige – Both family and non-family firms that appointed a prestigious auditor were found to have less underpricing than firms without a prestigious auditor, which is consistent with prevailing theories. However, these results were also statistically insignificant.

Firm Size – Using several measures of firm size for both family and non-family firms, the study found that large firms were less underpriced than small firms, which is consistent with existing 'size-effect' theories; however while the findings were statistically significant for non-family firms, issue size was the only variable accounting for significant variance. In contrast, all three proxies for firm size (assets, sales and issue size) were statistically significant for family firms and together accounted for the variance in market adjusted underpricing.

Firm Risk – In addition to firm size, several other measures were also used to test whether firm risk could explain variations in the level of initial underpricing, for instance firm age and variability of share returns after listing. The findings are consistent with accepted theories and show that riskier firms are more likely to have higher initial underpricing than firms with lower risk profiles. Moreover, after allowing for firm type (family and non-family) the findings continue to be consistent with existing theory, and statistically significant. Thus hypotheses 10(a) and 10(b), that firm risk is positively associated with initial underpricing, and that this association is moderated by firm type, are empirically supported in this study.

Profit Forecasts – Profit forecast was found to be positively related to initial underpricing, thus firms that included a profit forecast in their prospectus documents had higher underpricing than firms without a profit forecast. Moreover, this association continued to persist after allowing for firm type, however in both regression models profit forecast was not statistically significant.

9.3.1.2 Exogenous Factors

Changes to Regulatory Regime – Contrary to existing theories, the study found that underpricing was higher for IPO firms that listed in periods after the introduction of the Corporations Law compared with firms that listed before the new laws were introduced. Similar findings were reported for family firms as a separate group. Thus hypothesis 8 that level of initial underpricing of Australian IPOs is lower in the periods after the introduction of the Corporations Law 1991, than before the introduction of the law, is not supported.

However, the level of underpricing for family firms was lower than for non-family firms in both periods. In either case however, these outcomes are inconsistent with the proposition that a harsh regulatory environment would be expected to result in lower underpricing. Indeed as a consequence of the new laws, issuers and their advisers would have stronger incentives to prepare accurate and detailed information for inclusion in the prospectus, reducing uncertainty regarding the offer. Arguably, however, the new laws also could have created greater uncertainty, since the former provisions of the law relating to prospectus documents were prescriptive and were accompanied by detailed regulations that provided guidance to issuers and their advisers (specifically on matters and information regarding offer documents). These laws were repealed and replaced with essentially one general provision in the law relating to the information requirement of a prospectus. Thus, perceptions of a harsher compliance regime created by the new laws may have in fact been overshadowed by the uncertainty associated with changes to the system (i.e., from prescriptive to general). This could be one explanation for the conflicting results.

Market Cycles – The findings support a positive association between market cycles and the level underpricing for both family and non-family firms, suggesting that issues may be timed to coincide with 'hot market' periods. However, the results were not statistically significant, hence hypothesis 11(a) that Australian IPOs are more underpriced during 'hot' market periods than for 'cold' market periods, and 11(b) that the level of underpricing for both hot and cold periods are moderated by family control, are not supported.

9.3.1.3 Multiple variables

As discussed in chapter 5, a full WLS regression model was conducted to assess the effects of all relevant independent variables on market adjusted underpricing, including firm value, age, risk, issue size, ex ante uncertainty, underwriter and auditor prestige, together with FB_NFB and mining. The results show a robust model which explains over 38% of the variance in market adjusted underpricing, and all variables, except fractional interest, were consistent with the predicted sign. Moreover, the results were statistically significant for firm value, fractional interest, issue size, firm age, and underwriter reputation. Interestingly, the negative and significant relation between fractional interest and market adjusted underpricing is not consistent with the signalling hypotheses supported in Hypotheses 2(a) and 2(b) of the study. Indeed however, these findings may provide support Sum (1986), Rock (1986) and Beatty and Ritter's (1986) results; that a higher ALPHA (fractional interest) signals higher firm value and thus lower ex ante uncertainty. This may be significant for family firms since on average family firms have greater levels of fractional interest than non-family firms. This may also partly explain why, after industry effects, family firms are considerably more underpriced than non-family firms.

9.4 Aftermarket Operating Performance

The final section of the study empirically examined the operating performance of family and non-family IPO firms in the aftermarket period, using a number of different measures of financial performance. Operating performance was also measured against different levels of fractional interest and different age groupings for family and non-family firms. Moreover, multivariate regressions were conducted to determine whether there was an association between different measures of operating performance and factors known to influence performance, i.e., leverage, capital expenditure, firm age and fractional interest.

9.4.1 Operating Performance

By documenting significant decreases in operating performance in the aftermarket period, the findings in this study provide empirical support for prior international and Australian research. Moreover, the study provides evidence that while both family firms and non-family firms underperformed in the aftermarket period, the operating performance of non-family firms was higher than family firms in the aftermarket period. Thus hypothesis 12, that family IPO firms will outperform non-family IPO firms in the long-term, is not supported by the results of this study. This finding could initially be interpreted as an inconsistency with prevailing theory, particularly agency theory, which posits that firms with less diffuse ownership and control structures (family firms) should have lower agency costs post-listing and should outperform firms with diffuse ownership and control structures (non-family firms). Indeed, it is also well documented by a small but growing body of literature that ownership and control structures are irrelevant in determining operating performance (Demsetz & Lehn 1985; Demsetz & Villalonga, 2001). However, when operating performance is examined and compared between higher/lower ownership IPO firms and between established/younger firms, a different outcome (discussed below) is revealed.

9.4.2 Operating Performance and High/Low Ownership Firms

In contrast to the above findings, the study provides significant evidence that firms with higher equity retention by original shareholders/founders outperformed firms with lower equity retention by shareholders/founders, particularly in the first year following listing. This is consistent with agency theory, which posits that higher (owner/founder) ownership firms outperform their lower ownership counterparts (Jensen & Meckling, 1976). Similarly, these results support the findings in the study by Jain and Kini (1994), which also documents superior operating returns for firms with higher equity retention relative to their industry counterparts. Moreover, the study showed that there were no statistically significant differences in operating performance between family firms in the limited number of cases where lower ownership firms outperformed higher ownership firms, in contrast to non-family firms where some significant differences were documented. Arguably, therefore, family firms are more likely to exhibit significant differences in cases where higher ownership firms outperform lower ownership firms than in cases where lower ownership firms outperform higher ownership firms, relative to non-family firms. Hypotheses 13(a), that IPO firms with higher equity retention will outperform IPO firms with lower equity retention in the long-term, and 13(b), that family IPO firms with higher equity retention will outperform IPO non-family firms with higher equity retention in the long-term, are supported by these findings.

9.4.3 Operating Performance and Established/Young Firms

The study provides significant evidence that older and more established IPO firms outperform their younger counterparts in the long-term. However, the evidence for family firms is not particularly strong with only one case of statistical significance documented in the findings. Thus hypothesis 14(a), that established IPO firms will outperform younger IPO firms, is supported by the findings. However, hypothesis 14(b), that established family IPO firms will outperform established non-family IPO firms, is not supported.

9.4.4 Operating Performance and Independent Variables

The study found that fractional interest and firm age are positively associated with operating performance but both variables were found not to be statistically significant. In contrast, firm leverage and capital expenditure are significant variables in predicting operating performance although the sign of the coefficients for capital expenditure was not in the predicted direction. Moreover the results show the firm type (family and non-family has a moderating effect of the negative relationship between leverage and operating performance. Perhaps the more significant finding in respect to operating performance, relates to the results of the simple regression between several independent variables and operating performance. Indeed the variance in operating performance of IPO firms, can be substantially explained (R^2 greater than 60%) by the inter-correlation of the following independent variables; firm leverage, capital expenditure, fractional interest and firm age with firm type (family and non-family) and industry effects (mining).

9.5 Implications and Suggestions for Further Study

This study provides a contribution to the family business literature by establishing an operational definition of family business, at least in the context of capital markets. This outcome will enhance the ability of researchers to delineate family firms from non-family firms, which will arguably have implications for future research in the family business and finance disciplines. For instance, an operational definition of family business might now provide a basis for collecting and analysing more accurate data specifically relating to family firms. For example, vital economic statistics such as gross domestic product (often quoted in the family business literature to reflect the economic importance of family firms), can more accurately represent the contribution by family businesses. Moreover, given that the study provides evidence of some sizeable differences between families and non-family firms (for example financial attributes), it may be useful to develop market indicators specifically for family firms, for example a reliable market index to reflect the particular attributes of family firms.

Another finding in the study, which may have potential implications, is the significant differences in underpricing between family firms and non-family firms in the non-mining sector. This may have significant implications for market participants since family firms could arguably be considered as a more stable investment than non-family firms. Indeed for family firms there is a negative and significant association between firm size and underpricing, and between firm risk and underpricing. Moreover, in the full WLS model, fractional interest is negatively and significantly related to underpricing. These findings would suggest that family firms (particularly large family firms) may well be perceived as being more stable and less risky, and this may in part explain why family firms are significantly more underpriced than non-family firms. However, a perplexing issue with this explanation is that the findings in this study also support a signalling effect between firm value/fractional interest and underpricing, which implies a positive relation between firm value/fractional interest and underpricing.

The results also show that firm age, auditor prestige and underwriter prestige are in the predicted direction, however these results are not statistically significant and fail to provide reliable explanations. Perhaps further studies can examine the possibility that other factors (not considered in the present study) may explain the differences in initial returns between family and non-family firms. For instance by examining the potential effects of different capital structures or even the composition of equity retained by original shareholders, i.e., by differentiating between management holdings and founder holding, and determining the potential effect of 'retrenchment' on operating performance (McConaughy, 1994). Given that the availability of data was problematic for family firms in some of the earlier years, a longer time-frame may yield different results, for instance observations over a 20 or even 25 year period.

A further study could exam the long-term share price performance of family and non-family firms. This could be an important area of research since no study thus far has examined the long-term share price performance of family firms. Moreover, an examination of share price performance over a longer period, in contrast to initial returns based on a 'snapshot' of share price on the first day of trading, may not only reveal differences in returns between family and non-family firms, but may also provide plausible explanations for those differences, i.e., through factors known to influence share returns. It is further noted that a longer time period may provide considerably more data and allow for alternative research designs which were not possible in the current study due to lack of data (particularly for specific groups such as family mining firms). For example a matched-pair design would allow comparisons between family and non-family firms that were matched by industry, size, structure etc. Perhaps also related to longer term studies, is a study of further share issues by both family and non-family firms for some after the initial IPO, to determine whether these issues are more highly priced, thus lending support to the signalling hypothesis as reported in Welch (1989).

Another interesting outcome of the study is the higher levels of underpricing for periods after the introduction of the Corporations Law in 1991 than before the introduction of the Law. The suggestion here is that the introduction Corporation Law may have contributed to more uncertainty, resulting in greater underpricing. This finding may have important legislative implications particularly in terms of further research on the differential effects of prescriptive and general legislation. Indeed, in an effort to simplify corporate law and introduce new legislation which supported economic initiatives, the Australian government introduced a long term reform program; Corporate Law Economic Reform Program (CLERP), in March 1997. Further studies could examine whether deregulatory changes made to prospectus laws as a consequence of these CLERP initiatives, have impacted on the level of initial underpricing.

The results show that operating performance levels for family and non-family firms deteriorate for at least three years after listing. This finding is consistent with other studies and may have several implications. For instance, it may be a significant disincentive for issuing firms intending to go public, since considerable wealth will be lost not only from initial underpricing on the day of listing, but also through loss of profits (or potential profits) for a number of years in the periods subsequent to listing. There may also be implications for investors, particularly for those intending to take a long position, since the returns for IPO firms decline on average for three years after listing. Moreover, the declining returns is greater for family firms than for non-family firms, which could also have implications for investors choosing between competing alternatives.

The results of the study could also have potential implications for regulators who are required to monitor the activities of public entities and protect the integrity of the capital market. It would appear that an authoritative body of international and Australian evidence, which documents post-issue decrements in operating performance, is gathering considerable momentum. Thus further findings that support these studies could have implication for regulatory intervention, for instance greater surveillance of prospectus documents (particularly operating performance forecasts) and financial reports for a number of periods post-listing.

Perhaps, as a final point, some mention should made of the potential limitations of the study, not so much that they have been an impediment to the study, but more that the above results need to be interpreted in the context of these limitations. Briefly, some of the more important limitations are acknowledged in the following paragraphs; 1) Although an extensive review of the family business literature has been undertaken, the focus of the review was on definitional and performance aspects, thus several aspects of family firms have not been given extensive coverage and are outside the scope of the study (for instance, succession and behavioural issues), 2) Notwithstanding the ability to access several databases, missing data was problematic for some companies and presented challenges in the analysis. Many of these problems, particularly those relating to financial variables, were able to be remedied via conventional statistical techniques. However, after the initial issue of shares following the IPO, the task of tracing share ownership (for instance to determine the level fractional interest in Year +1 and +2) was difficult due to lack of data and certain assumptions were required to complete these traces and the links between relevant shareholders (for instance, ownership of share by persons with similar names were accumulated as part of the family allotment), 3) Consistent with current literature, this study uses a number of measurement models and benchmarks for determining and assessing operating performance. However, it is acknowledged that there is only a limited number of studies which fully articulate these models and indeed there may be other more appropriate measures of operating performance that may be applied, for example, a market-based earnings measures as proposed by Ohlson (1995).

9.6 Conclusion

This study provides an operational definition of family business, which is utilised for undertaking capital market research in the areas encompassing initial underpricing and long-term operating performance of IPO firms. The results of the study validate prior research by providing evidence of significant initial underpricing for Australian companies over a 12-year period. The findings also provide empirical evidence that family firms in the non-mining sector are considerably less underpriced than non-family firms, and a number of possible explanations are provided for these differences.

The study also supports prior research that IPO firms under perform in the long-term and further shows that the operating performance of family firms is less than non-family firms. Older and more established firms are shown to outperform their younger counterparts, while family firms with high equity retention outperform their non-family counterparts. Moreover fractional interest, capital expenditure and firm leverage are shown to be reliable predictors of operating performance for both family and non-family firms.

Appendix 1

Family Business Research Literature

Author(s)	Year of Publication	Country or market	Journal or Publication	Definitional Basis
Donnelly	1964	United States		Ownership and Family relatedness
Burch	1972	United States		Listed family business: Ownership and Family involvement
Barry	1975	United States	Journal of General Management	Ownership and Management: Control
Barnes & Hershon	1976	United States	Harvard Business Review	Ownership and Management: Control and Power transference
Alcorn	1982	United States	McGraw-Hill	Ownership and Management: Ownership, Control and Profit making process
Khan & Rocha	1982	United States		Ownership (p.35)
Beckard & Dyer	1983	United States		Interdependent subsystems
Davis	1983	United States	Organisational Dynamics	Interdependent subsystems (Family influence)
Litz	1985	United States		Ownership and Management: Family related ness
Rosenblatt, deMik, Anderson & Johnson	1985	United States	Jossey-Bass	Ownership and Family relatedness
Dyer	1986	United States		Ownership and Management: Family relationship, Absentee-owned and Latent family
Pratt & Davis	1986	United States		Ownership and Management: Control
Babicky	1987	United States	Journal of Management Consulting	Ownership and Management: Ownership

Author(s)	Year of Publication	Country or market	Journal or Publication	Definitional Basis
Churchill & Hatten	1987	United States	American Journal of Small Business (AJSB)	Generational transfer
Upton & Sexton	1987	England		Ownership and Management: Family relatedness
Ward	1987	United States	Jossey-Bass	Generational transfer
Gallo	1988	Spain		Ownership and Management
Landsberg, Perrow & Rogolsky	1988	United States	Family Business Review	Ownership and Management: Control
Handler	1989	United States	Family Business Review	Ownership and Management, Interdependent subsystems, Generational transfer, and Multiple conditions
Dreux	1990	United States	Family Business Review	Ownership and Management: Control
Stoy Hayward & the London Business School	1990	England		Ownership and Management: Control (p.40)
Ward	1990	United States		Ownership and Management: Family influence
Ward & Aronoff	1990	United States		Ownership and Control
Donckels & Frohlich	1991	European: Austria, Belgium, Germany, Finland, France, UK, Netherlands and Switzerland	Family Business Review	Ownership and Management: Ownership and Control
Gallo & Sveen	1991	Spain	Family Business Review	Ownership and Management: Ownership and Control
Lyman	1991	United States	Family Business Review	Ownership and Management: Ownership and Business involvement
Jetha	1993	United States		Generational transference

Author(s)	Year of Publication	Country or market	Journal or Publication	Definitional Basis
Upton, Vinton Seaman & Moore	1993	United States	Family Business Review	
Welsch	1993	West Germany	Family Business Review	Ownership and Management: Ownership, Control and Business involvement
Astrachan & Kolenko	1994	United States	Family Business Review	Multiple conditions: Ownership, Control, Family involvement and Generation transference, Number of employees, Incomes and Operational period
Covin	1994	United States	Journal of Small Business Management	Ownership and Management: Ownership
Fiegener, Brown, Prince & File	1994	United States and Canada	Family Business Review	Ownership and Management: Control and Business involvement
McConaughy	1994	United States		Generational transference
Upton	1994	England		Ownership and Control
Wortman	1994	England		
Fodor, Lash & Mazza	1995	United States		Ownership and Control
Litz	1995	United States	Academy of Management Journal	Ownership and Management: Family involvement and Value preferences
Shanker & Astrachan	1995	United States		Control, Family involvement and Generational transference
Wortman	1995	United States	Proceedings of the 40th International Council for Small Business Conference	
Astrachan & Shanker	1996	United States		Multiple conditions: Ownership, Control, Family involvement and Generation transference
Connolly & Jay	1996	United States		Ownership and Control
Shanker & Astrachan	1996	United States		Ownership and Control

Author(s)	Year of Publication	Country or market	Journal or Publication	Definitional Basis
Sharma, Chrisman & Chua	1996	United States		Authoritative synthesis of the various contributions to definitional issues
Smyrnios, Romano & Tanewski	1997	Australia		Ownership and Management; Control
Gallo & Vilaseca	1998	Spain		Ownership and Management: Ownership, Business involvement and Ownership transference
Smyrnios, Tanewski & Romano	1998	Australia		Ownership and Management
Neubauer & Lank	1999	United States		
Schillaci & Faraci	1999	Italy		Ownership and Management
Chua, Chrisman & Sharma	1999	United States		Power transference and Dominant coalition

Appendix 2

Underpricing Research Literature

Author(s)	Year of Publication	Country or market	Journal or Publication	Observation period	No of IPOs	Excess Returns
Merret Howe and Newbould	1967	United States	-			
Reilly & Hatfield	1969	United States	FAJ	1963 – 1965	53	9.9%
Stoll & Curley	1970	United States	JFQA	1957 – 1963	205	60.60%
Shaw	1971	Canada	JF	1956 – 1963	75	28.5%
McDonald & Fisher	1972	United States	JF	1969	142	28.5%
Logue	1973	United States	JFQA	1965 – 1969	250	41.7%
Reilly	1973	United States	JFQA	1965 – 1966	62	10.2%
Nueberger & Hammond	1974	United States	JFQA	1965 – 1969	816	17.0%
Ibbotson	1975	United States	JFE	1960 – 1969	120	11.4%
Ibbotson & Jaffe	1975	United States	JF	1960 – 1970	2650	16.8%
Bear & Curley	1975	United States	JFQA	1969	140	9.5%
Davis & Yeomans	1976	United Kingdom	JBFA	1965 – 1971	174	9.9%
Reilly	1978	United States	FM	1972 – 1975	486	10..9%
Block & Stanley	1980	United States	FM	1974 – 1978	102	5.9%
Neuberger & LaChapelle	1983	United States	FM	1975 – 1980	118	27.7%
Ritter	1984 (a)	United States	JB	1960 – 1982	5162	18.8%
Ritter	1984 (a)	United States	JB	1977 – 1982	1028	26.5%
Ritter	1984 (a)	United States	JB	1980 – 1981	325	48.4%
Ritter	1985	United States	JFE	1977 – 1982	664	14.8%
Chalk and Peavey	1985	United	-	1974 – 1982	415	10.6%

Author(s)	Year of Publication	Country or market	Journal or Publication	Observation period	No of IPOs	Excess Returns
		States				
Chalk & Peavey	1987	United States	FAJ	1975 – 1980	649	21.67
Dawson	1987(a)	HK, Sing,Maly	JBFA	1978 – 1983	81(tot)	13-166%
Miller & Reilly	1987	United States	FM	1982 – 1983	510	9.87%
Jog & Riding	1987	Canada	FAJ	1971 – 1983	100	9-11.5%
McConnell & Sanger	1987	United States	JF	1926 – 1982	2482	-1.45%
Balvers, McDonald & Miller	1988	United States	AR	1981 – 1985	1182	7.84
Dawson & Reiner	1988	United States	MIR	1977 – 1985	51	28%
Johnson & Miller	1988	United States	FM	1981 – 1983	962	3.22-14%
Muscarella	1988	United States	FR	1983 – 1987	50	.24%
Young & Zaima	1988	United States	JBV	1980 – 1984	316	44%
Tinic	1988	United States	JF	1923 – 1930	70	5.17%
Tinic	1988	United States	JF	1966 – 1971	134	11.06%
Finn & Higham	1988	Australia	JBF	1966 – 1978	93	29.2%
Muscarella et al	1989(a)	United States	JFR	1983 – 1987	74	2.04%
Muscarella et al	1989(b)	United States	JFE	1970 – 1987	38	7.12
Koh & Walter	1989	Singapore	JFE	1973 – 1987	66	27 – 28%
Beatty	1989	United States	AR	1975 – 1984	2215	22.1%
Aggarwal & Rivioli	1990	United States	FM	1977 – 1987	1598	10.67%
Ayling	1990	United Kingdom	MF	1987	53	25.3%
Barry et al	1990	United States	JFE	1978 – 1987	433	8.43%
Levis	1990	United Kingdom	EJ	1985 – 1988	123	8.6%
James & Weir	1990	United States	JFE	1980 – 1983	549	13.32%
Menyah et al.	1990	United Kingdom	ABR	1981 – 1987	34	12%-41%
Saunders & Lim	1990	Singapore	ABR	1987 – 1988	17	45.4%
Slovin & Young	1990	United States	JBF	1980 – 1984	316	43%
Levis	1993	United	FM	1980 – 1988	712	14.3%

Author(s)	Year of Publication	Country or market	Journal or Publication	Observation period	No of IPOs	Excess Returns
		Kingdom				
Aggrawal et al.	1993	Braz, Chile, Mex	FM	1980 – 1990	125	2.8-78.5%
Barry & Jennings	1993	Hong Kong	Omega	1980 – 1990	93	16.36%
Keloharju	1993	Finland	JFE	1984 – 1987	91	8.7%
Mian & Rosenfeld	1993	United States	FM	1983 – 1988	85	-0.58%
Affleck-Graves et al.	1993	United States	FM	1983 – 1987	1078	2-10%
How & Low	1993	Australia	PBFJ	1978-1989	523	16.34%
McGuiness	1993(a)	Hong Kong	JBFA	1980 – 1990	92	16.59%
Steen	1997	Australia	Unpublished	1984 - 1994	649	23.53%
Holland & Horton	1993	United Kingdom	ABR	1986 – 1989	230	12.78%
Kim et al.	1993	Korea	JBFA	1988 – 1990	177	57.54%
Balvers et al.	1993	United States	RQFA	1975 – 1987	1746	8.15%
Drake & Vetsuypens	1993	United States	FM	1969 – 1990	93	9.18%
Jain	1994	United States	QREF	1980 – 1988	2343	12%

Appendix 3

Family Business Questionnaire

Emerging Accounting and Auditing Issues Group

Wednesday, 13th December 2000

IPO Research – Monash University

Questionnaire

MONASH UNIVERSITY

Defining a Family Business

1. Generally, do you believe that family businesses have attributes that are different to non-family businesses? (please tick the appropriate box).

☐ Yes ☐ No If "No", please go to Question 3.

2. Which attributes are likely to be different between family businesses and non-family businesses? Indicate the extent of significance by circling one or more attributes if relevant.

		Not Appropriate			*Highly Appropriate*	
a.	Ownership structure	0	1	2	3	4
b.	Control structure	0	1	2	3	4
c.	Management structure	0	1	2	3	4
d.	Debt/equity mix	0	1	2	3	4
e.	Performance	0	1	2	3	4
f.	Firm size	0	1	2	3	4
g.	Firm age	0	1	2	3	4
h.	Other (Please briefly list)					

3. How would you define a family business? (please circle the most appropriate response)

a) A business which is controlled by a person or collectively by persons that are related
b) A business which is owned by a person or collectively by persons that are related
c) A business which is dominated by one or more persons that are related
d) All of the above
e) None of the above
f) Other (Please provide brief definition) ________________________

4. To what extent do you believe that dominance (with respect to operating and financing decisions) by one or more related individuals is a significant factor in family business? (indicate extent of significance on the scale)

Not significant 0 1 2 3 4 *Highly significant*

5. Given the above questions concerning the definition of family business, are there any other comments you wish to make?

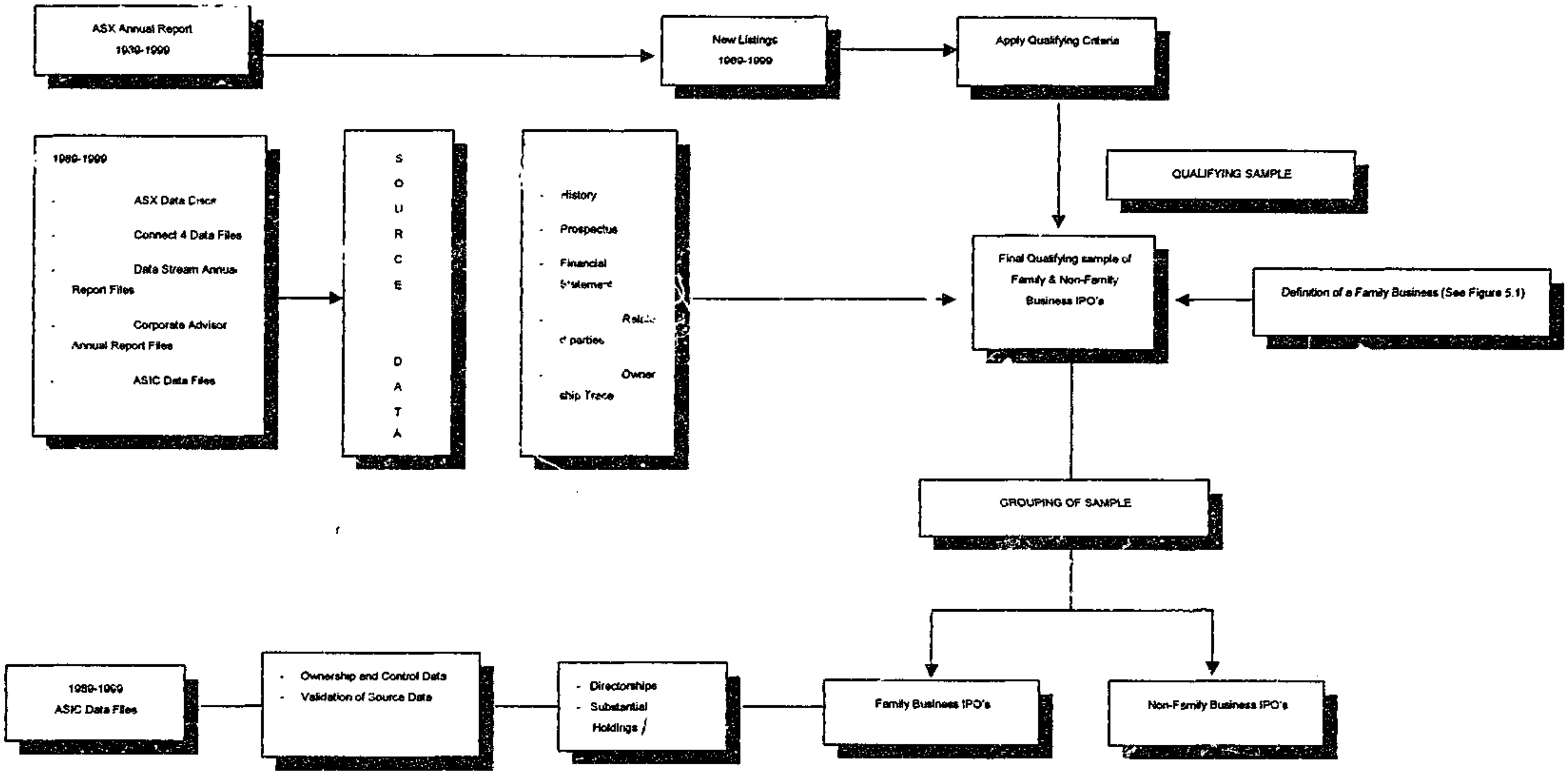
Thank you for your valued contribution.

[redacted]

Nicholas A Mroczkowski

Appendix 4

Validation Procedures – Initial Underpricing



Appendix 5

Comparison of Mean/Median Operating Performance Levels – JKROA

Panel A – All Observations

Variable: JKROA
Comparison of Means/Medians
Panel A -All Observations

Part I – Levels

Levels		Year-1	Year 0	Year+1	Year+2
Mean	*FB*	0.069	0.030	0.024	-0.145
	NFB	-0.005	-0.108	0.035	-0.113
Median	*FB*	0.080	0.050	0.090	0.050
	NFB	0.030	0.030	0.090	0.030
***t*- Stat**		-1.027	-0.812	0.276	0.229
***P*-Value**		0.305	0.417	0.783	0.819
MWU -*Z*		-1.737	-1.350	-0.326	-0.385
***P*-Value**		0.082	0.177	0.744	0.701
No of Observations	*FB*	60	107	85	88
	NFB	151	361	260	381

Part II - Changes in Levels

Changes in Levels		-1, 0	0, +1	+1, +2
Mean	*FB*	-0.103	-0.448	-1.236
	NFB	0.001	0.009	-1.622
Median	*FB*	-0.140	-0.125	-0.300
	NFB	0.000	0.000	-0.100
***t*- Stat**		0.243	0.650	-0.275
***P*-Value**		0.809	0.516	0.784
MWU -*Z*		-2.277	-0.667	-1.333
***P*-Value**		0.023	0.505	0.183
No of Observations	*FB*	52	78	76
	NFB	137	216	299

Comparison of Mean/Median Operating Performance Levels – JKROA

Panel B – Non-Mining Observations

Variable: JKROA
Comparison of Means/Medians
Panel B -Non-Mining observations

Part I - Levels

Levels		Year-1	Year 0	Year+1	Year+2
Mean	*FB*	0.111	0.052	0.021	-0.074
	NFB	0.013	0.026	0.033	-0.098
Median	*FB*	0.095	0.070	0.090	0.050
	NFB	0.050	0.050	0.100	0.060
t- Stat		-1.368	-0.602	0.275	-0.138
P-Value		0.173	0.548	0.783	0.890
MWU -*Z*		-1.511	-1.117	-0.401	-0.423
P-Value		0.131	0.264	0.689	0.672
No of Observations	*FB*	52	90	82	71
	NFB	125	275	233	275

Part II - Changes in Levels

Changes in Levels		-1, 0	0, +1	+1, +2
Mean	*FB*	0.012	-0.584	-0.996
	NFB	0.200	-0.110	-0.999
Median	*FB*	-0.140	-0.140	-0.265
	NFB	0.060	0.000	-0.055
t- Stat		0.551	0.660	-0.002
P-Value		0.582	0.510	0.999
MWU -*Z*		-2.380	-0.986	-1.599
P-Value		0.017	0.324	0.110
No of Observations	*FB*	44	75	60
	NFB	115	197	220

Appendix 6

Comparison of Mean/Median Operating Performance Levels – JKCFOA

Panel A – All Observations

Variable: JKCFOA

Comparison of Means/Medians

Panel A -All Observations

Part I – Levels

Levels		Year-1	Year 0	Year+1	Year+2
Mean	*FB*	0.020	-0.032	-0.071	-0.205
	NFB	-0.062	-0.168	-0.046	-0.184
Median	*FB*	0.020	0.000	0.020	-0.020
	NFB	0.010	0.000	0.025	-0.005
t- Stat		-1.030	-0.791	0.516	0.143
P-Value		0.304	0.430	0.607	0.887
MWU -*Z*		-1.201	-0.648	-0.729	-0.467
P-Value		0.230	0.517	0.466	0.641
No of Observations	*FB*	50	106	78	87
	NFB	149	359	240	380

Part II - Changes in Levels

Changes in Levels		-1, 0	0, +1	+1, +2
Mean	*FB*	-0.222	-0.005	-1.189
	NFB	0.146	-0.926	-1.628
Median	*FB*	-0.250	-0.120	-0.140
	NFB	0.000	-0.060	-0.250
t- Stat		0.727	-0.770	-0.433
P-Value		0.468	0.442	0.665
MWU -*Z*		-1.155	-0.244	-0.178
P-Value		0.248	0.808	0.858
No of Observations	*FB*	43	68	75
	NFB	138	195	296

Comparison of Mean/Median Operating Performance Levels – JKCFOA

Panel B – Non-Mining Observations

Variable: JKCFOA

Comparison of Means/Medians

Panel B -Non-Mining observations

Part I - Levels

Levels		Year-1	Year 0	Year+1	Year+2
Mean	*FB*	0.076	-0.018	-0.076	-0.139
	NFB	-0.041	-0.037	-0.045	-0.166
Median	*FB*	0.035	0.020	0.020	0.020
	NFB	0.030	0.020	0.040	0.030
t- Stat		-1.442	-0.409	0.600	-0.147
P-Value		0.151	0.683	0.549	0.883
MWU -*Z*		-0.970	-0.008	-1.054	-0.875
P-Value		0.332	0.994	0.292	0.382
No of Observations	*FB*	42	89	75	70
	NFB	123	274	215	274

Part II - Changes in Levels

Changes in Levels		-1, 0	0, +1	+1, +2
Mean	*FB*	-0.285	-0.067	-0.945
	NFB	0.183	-1.153	-1.186
Median	*FB*	-0.260	-0.130	-0.160
	NFB	-0.040	-0.030	-0.220
t- Stat		0.787	-0.858	-0.205
P-Value		0.432	0.392	0.838
MWU -*Z*		-1.204	-0.371	-0.071
P-Value		0.229	0.711	0.943
No of Observations	*FB*	35	65	59
	NFB	116	178	218

Appendix 7

Comparison of Mean/Median Operating Performance Levels – STROA

Panel A – All Observations

Variable: STROA

Comparison of Means/Medians

Panel A -All Observations

Part I - Levels

Levels		Year-1	Year 0	Year+1	Year+2
Mean	*FB*	0.059	0.029	0.017	-0.148
	NFB	-0.011	-0.113	0.019	-0.108
Median	*FB*	0.095	0.055	0.090	0.050
	NFB	0.000	0.130	0.145	-0.070
t- Stat		0.986	0.831	-0.067	-0.260
P-Value		0.325	0.406	0.946	0.795
MWU -*Z*		-1.615	-1.360	-0.166	-0.318
P-Value		0.106	0.174	0.868	0.750
No of Observations	*FB*	58	106	82	87
	NFB	151	361	256	380

Part II - Changes in Levels

Changes in Levels		-1, 0	0, +1	+1, +2
Mean	*FB*	0.020	-0.033	-1.437
	NFB	0.013	-0.694	-0.168
Median	*FB*	-0.045	-0.080	-0.245
	NFB	0.020	0.000	-0.210
t- Stat		0.020	0.612	0.168
P-Value		0.984	0.541	0.867
MWU -*Z*		-1.509	-0.141	-0.702
P-Value		0.131	0.888	0.482
No of Observations	*FB*	50	73	76
	NFB	138	211	297

Comparison of Mean/Median Operating Performance Levels – STROA

Panel B – Non-Mining Observations

Variable: STROA

Comparison of Means/Medians

Panel B -Non-Mining observations

Part I - Levels

Levels		Year-1	Year 0	Year+1	Year+2
Mean	*FB*	0.103	0.051	0.013	-0.074
	NFB	0.006	0.021	0.018	-0.086
Median	*FB*	0.115	0.070	0.090	0.060
	NFB	0.070	0.060	0.900	0.060
t- **Stat**		1.349	0.704	-0.116	0.064
P-**Value**		0.179	0.482	0.908	0.949
MWU -*Z*		-1.426	-1.072	-0.107	-0.412
P-**Value**		0.154	0.284	0.915	0.681
No of Observations	*FB*	50	89	80	70
	NFB	125	275	231	274

Part II - Changes in Levels

Changes in Levels		-1, 0	0, +1	+1, +2
Mean	*FB*	0.095	-0.160	-1.232
	NFB	0.224	-0.853	-1.011
Median	*FB*	-0.045	-0.080	-0.245
	NFB	0.065	0.000	-0.180
t- **Stat**		-0.626	0.614	-0.126
P-**Value**		0.533	0.540	0.900
MWU -*Z*		-1.890	-0.288	-0.832
P-**Value**		0.059	0.774	0.405
No of Observations	*FB*	42	71	60
	NFB	116	192	218

Appendix 8

Comparison of Mean/Median Operating Performance Levels – STCFOA

Panel A – All Observations

Variable: STCFOA
Comparison of Means/Medians
Panel A -All Observations

Part I – Levels

Levels		Year-1	Year 0	Year+1	Year+2
Mean	*FB*	-0.049	-0.008	-0.089	-0.082
	NFB	0.012	-0.011	-0.037	-0.036
Median	*FB*	0.000	0.000	0.000	0.010
	NFB	0.000	0.000	0.000	0.010
t- Stat		-0.991	0.096	-1.073	-1.081
P-Value		0.323	0.924	0.285	0.282
MWU -*Z*		-0.481	-0.062	-0.011	-0.104
P-Value		0.630	0.951	0.991	0.917
No of Observations	*FB*	54	107	109	87
	NFB	152	364	410	381

Part II - Changes in Levels

Changes in Levels		-1, 0	0, +1	+1, +2
Mean	*FB*	-0.501	-2.983	-1.791
	NFB	0.246	-0.443	-0.415
Median	*FB*	-0.170	-0.320	-0.520
	NFB	0.060	-0.105	-0.100
t- Stat		-1.181	-1.897	-0.952
P-Value		0.239	0.059	0.344
MWU -*Z*		-1.589	-1.374	-1.460
P-Value		0.112	0.170	0.144
No of Observations	*FB*	43	90	67
	NFB	121	284	255

Comparison of Mean/Median Operating Performance Levels – STCFOA

Panel B – Non-Mining Observations

Variable: STCFOA

Comparison of Means/Medians

Panel B -Non-Mining observations

Part I – Levels

Levels		Year-1	Year 0	Year+1	Year+2
Mean	*FB*	0.041	-0.000	-0.048	-0.059
	NFB	0.016	-0.001	-0.021	-0.019
Median	*FB*	0.005	0.015	0.020	0.025
	NFB	0.010	0.010	0.010	0.030
t- Stat		0.511	0.038	-0.791	-0.837
P-Value		0.610	0.970	0.429	0.403
MWU -*Z*		-0.049	-0.165	-0.394	-0.469
P-Value		0.961	0.869	0.693	0.639
No of Observations	*FB*	46	90	91	70
	NFB	125	276	302	275

Part II - Changes in Levels

Changes in Levels		-1, 0	0, +1	+1, +2
Mean	*FB*	-0.377	-0.964	-1.436
	NFB	0.447	-0.137	0.091
Median	*FB*	-0.185	-0.290	-0.540
	NFB	0.000	-0.030	-0.110
t- Stat		[illegible]80	-1.096	-0.907
P-Value		0.170	0.274	0.368
MWU -*Z*		-1.599	-1.374	-2.136
P-Value		0.110	0.169	0.033
No of Observations	*FB*	36	75	53
	NFB	103	217	191

Appendix 9

Summary of Statistical Significance

Fractional Interest and Operating Performance

Ownership-Significance	SUPPORT					NON-SUPPORT			
	-1	0	1	2		-1	0	1	2
All Observations									
JKROA		√							
JKCFOA		√							
STROA		√							
STCFOA		√							
Family									
JKROA		√							
JKCFOA									
STROA		√	√						
STCFOA		√							
Non-Family									
JKROA		√						√	
JKCFOA		√		√				√	
STROA		√		√				√	
STCFOA									
Family-Non-mining									
JKROA							√		
JKCFOA									
STROA		√							
STCFOA									
Non-Family-Non-mining									
JKROA				√				√	
JKCFOA								√	
STROA								√	
STCFOA								√	

Appendix 10

Summary of Statistical Significance

Firm Age and Operating Performance

Age-Significance	Support				Non- Support			
	-1	0	+1	+2	-1	0	+1	+2
All Observations								
JKROA	√	√		√				
JKCFOA	√	√	√	√				
STROA	√	√		√				
STCFOA			√	√				
Family								
JKROA								
JKCFOA								
STROA		√						
STCFOA								
Non-Family								
JKROA	√	√		√				
JKCFOA		√		√				
STROA		√	√	√				
STCFOA			√	√				
Family-Non-mining								
JKROA		√						
JKCFOA								
STROA		√						
STCFOA								
Non-Family-Non-mining								
JKROA	√	√						
JKCFOA		√						
STROA	√			√				
STCFOA				√				

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