MONASH UNIVERSITY
THESIS ACCEPTED IN SATISFACTION OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
ON.....16 August 2005.....
[redacted]
.....
Sec. Research Graduate School Committee

Capital Structure Decisions of Australian Family Controlled Firms

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A THESIS SUBMITTED FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

DEPARTMENT OF ACCOUNTING AND FINANCE
FACULTY OF BUSINESS AND ECONOMICS
MONASH UNIVERSITY
MARCH 2005

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STATEMENT OF AUTHORSHIP

Except for any works and materials produced by other persons and organizations, which have been duly acknowledged and cited in this thesis, all the works and materials contained herein are the original works and materials of the author.

This thesis, including any works and materials in whole or in part, has not been previously submitted for the award of any other degree, diploma, or any other qualifications in any other academic institution.

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

Harijono

Date .....31/03/2005.....

ACKNOWLEDGEMENT

Over the period of the research study, numerous people have helped make the completion of the thesis is a reality. Therefore, I would like to take this opportunity to thank them. Starting with my supervisors, Dr. George Tanewski and Professor Mohammed Ariff, I would like to express my sincere appreciation and deepest thanks to them for excellent supervision, guidance, and motivation they provided in the preparation of this thesis. My interaction with them motivates me to undertake further research.

I would also like to express my gratitude to Dr Nicholas A. Mroczkowski for his invaluable assistance in making available a list of family and non-family controlled firms on the Australian Stock Exchange.

My study was supported by funding from Australian Development Scholarship (ADS). Therefore, I would like to thank them for financial support that enable the completion of this thesis. Also, assistance from Jim, Divina and Robin of Monash International Office are greatly appreciated.

Further thanks go to Petko Kalev, Pramuan Bunkanwanicha, Yilmaz Guney, Tom Aabo and participants of 2004 European Financial Management Association meeting for their comments and input, which significantly improve Chapter 7 of this thesis. Also, I am deeply indebted to Megan Selman for her help in proof reading of my thesis.

I wish to thank colleagues and friend (Lukas, Marwoto, Rubi. Mbak Hani, Mbak Titi, Mbak Rita, Ayu, Nui, Sheng, Catherine, David) for their continuing support and encouragement since the beginning of my candidature.

Last but not least, this thesis would never have been done without incredible love, support and understanding of my wonderful, lovely family. To my wife Henny and daughter, Fiona, special thanks for you.

ABSTRACT

Ownership structure influences the incentives of managers and shareholders, and has an impact on capital structure decisions. One important aspect of ownership structure is family control. Families represent a special class of large shareholders that potentially have unique incentive structure and power in the firm (Anderson *et al.*, 2003). From agency and incomplete contract perspectives, there are two characteristics of families that make them different from other types of large shareholders or managers of widely-held firms. First, the combination of highly valuable private benefits of control and significant firm-specific human capital motivate families to maintain control of their company. Second, with substantial wealth and human capital at risk, family owners tend to be more risk averse than their non-family counterparts. These unique characteristics provide reasoning why capital structure decisions of family firms differ from those of non-family firms.

Panel data from publicly listed firms in Australia from 1998 to 2002 were used to investigate the impact of family control on capital structure decisions. Employing various panel data regression techniques, this study found several important findings. First, family firms in Australia have higher levels of leverage compared to non-family firms. The result is consistent with the argument that families use debt to concentrate voting power. The objective is to protect the families' highly valued private benefits of control and firm-specific human capital. Since debt has no voting power, the issuance of debt instead of new equity protects the dominance of families. Additional analyses on the data based on industry (i.e., mining versus industrial sectors) and firm size (i.e., small versus large firms), provides evidence that the desire to use debt to maintain

control is stronger for family firms operating in the mining sector (where private benefits of control is higher) and among smaller family firms (where the families' financial constraint is not a crucial issue).

Second, with regard to debt structure decisions (i.e., type of debt used), family controlled firms use debt maturity and leasing decisions more frequently to reduce the probability of financial distress. Financial distress can be very costly for family shareholders because it adversely affects their significant financial and human capital. More importantly, financial distress generally leads to a shift in control from family to lenders and therefore, families lose benefits from controlling their firms. A combination of these factors motivates families to reduce firm risk by avoiding shorter-term debt and using higher proportions of lease contracts. By its nature, short-term debt must be negotiated frequently. Although short-term debt is used by firms to avoid locking their financing costs with long-term debt, it nonetheless has liquidity risk. At negotiation date, bad news might become available and borrowers are forced into inefficient liquidation because refinancing is not available or the costs of borrowing are high. Similar to short-term debt, leasing is used to reduce financial distress risk. That is, by using lease contracts, firms (i.e., lessees) effectively transfer the risk associated with the use of assets to leasing companies (i.e., lessors).

Third, further analyses using simultaneous equations modeling technique support the argument that family firms in Australia use leverage, debt maturity and leasing jointly to reduce the agency costs of debt. The family's interest in the firm's long-term survival and its concern with reputation motivates them to limit underinvestment and asset substitution problems for the sake of enhancing firm value.

The findings of this study provide several important implications. First, this study finds that capital structure decisions of family firms from non-family firms are different as a result of their unique incentive structure and provides support to extant literature showing that family controlled firms differ. Second, the results of this study provide evidence that capital structure decisions are not only affected by ownership concentration but also by ownership composition. Third, this study suggests that a positive impact of family control on firm value found in previous studies (e.g., McConaughy *et al.*, 1998; Anderson and Reeb, 2003a) is likely to be mediated by capital structure decisions.

CHAPTER 1
INTRODUCTION

1.1 Research Background and Contribution

In recent years there has been an increasing tendency to study the impact of ownership structure on capital structure in the broader context of agency theory. Under the agency perspective, capital structure decisions are not only determined by internal and external factors such as tax, financial distress costs, and macroeconomics conditions, but also by the values, goals, preferences and desires of managers and shareholders (Brailsford *et al.*, 2002). Since ownership structure influences the incentives of managers and shareholders, it can be argued that ownership structure has an impact on capital structure decisions.

Two key aspects of corporate ownership structure are concentration and composition (Capulong *et al.*, 2000). The degree of ownership concentration in a company determines the distribution of power between its managers and shareholders. When ownership is dispersed, shareholder control tends to be weaker. In contrast, shareholders can play an important role in monitoring management when ownership is concentrated. A second key aspect of corporate ownership structure is its composition, namely the make-up of the controlling shareholders. As noted by Holderness and Sheehan (1988) and Gugler (2001), each type of large shareholder might have different incentives and motivations. Unfortunately, "academic studies and public debates have generally ignored the identity of large-block shareholders" (Holderness and Sheehan, 1988, p. 323).

Most studies on the impact of ownership on capital structure (e.g., Kim and Sorensen, 1986; Agrawal and Mandelker, 1987; Friend and Lang, 1988; Mehran, 1992; Jensen *et al.*, 1992, for U.S. firms and Brailsford *et al.*, 2002 for Australian firms) have only focused on ownership concentration, but do not incorporate ownership composition. Recently La Porta *et al.* (1999) documented that most firms in the world are controlled by families. Such family ownership is not only nearly universal among privately held firms, but is also prevalent among publicly traded firms. In Western Europe, South and East Asia, Middle East, Latin America, and Africa, the vast majority of publicly traded firms are family controlled (La Porta *et al.*, 1999; Claessens *et al.*, 2002; Faccio and Lang, 2002). Claessens *et al.* (2002) reported that more than 50 percent of publicly traded corporations in East Asian countries are controlled by a family, while Faccio and Lang (2002) documented that nearly 50 percent of public firms in Western Europe are under family control.

Even in the United States where it is believed that firms are dominated and controlled by professional managers (Morck and Yeung, 2003), the role of family firms is not insignificant. While examining the Standard & Poor's top 500 firms in the U.S. from 1992 through 1999, Anderson and Reeb (2003a) observe that founding families are a prevalent and important class of investors in most industry groups. Family firms comprise over 32 percent of the S&P 500 Industrials and on average families own nearly 18 percent of their firms' outstanding equity.

Family controlled firms are also prevalent in Australia. Lamba and Stapledon (2001) showed that in terms of blockholder identities, families are by far the most prevalent controlling shareholders in Australia. In addition, Mroczkowski and Tanewski (2005) found that around 17 percent of public firms in Australia are under family control.

Due to its economic significance, family firms deserve special attention from researchers. However, very little is known about how these businesses differ from those owned by other types of shareholders, for it is only in the last decade that serious academic research on family firms has been undertaken (Chami, 1999). This study is part of a growing interest in family business research. Specifically, the study focuses on another yet-studied topic on how family control of public listed firms affects capital structure decision-making in Australia. Thus this study addresses four main research questions:

1. Is the leverage of family controlled firms different from that of non-family controlled firms?
2. Is the debt maturity of family controlled firms different from that of non-family controlled firms?
3. Are leasing decisions of family controlled firms different from that of non-family controlled firms?
4. Is joint determination of capital structure decisions (i.e., leverage, debt maturity and leasing) in family controlled firms different from that of non-family controlled firms?

Families represent a special class of large shareholders that potentially have a unique incentive structure and power in the firm (Anderson *et al.*, 2003) to determine important financial decision. There are two main characteristics of families that make them different from other types of large shareholders or managers of widely-held firms. First, families have a strong desire to maintain control of their company in order to protect their highly valuable private benefits of control and firm-specific human capital. Second, with substantial wealth and human capital at risk, family owners tend to be

more risk averse than their non-family counterparts. These unique characteristics of family firms suggest that their capital structure decisions might differ from non-family firms.

Thus this study aims to make several important contributions to the literature on capital structure and family business. First, extant research on the impact of family control on leverage focus on countries that have high private benefits of control but weak investor protection (see Wiwattanakantang's 1999 study of Thai firms) or on countries that have strong legal protection, but low private benefits of control (Mishra and McConaughy, 1999; Anderson and Reeb, 2003b, who focus on U.S. firms). Australia is a country that has good investor protection (La Porta *et al.*, 1999), but at the same time also has high private benefits of control (Nenova, 2003). These factors make this study unique as it is possible to test whether the behaviour of family firms is more consistent with "*law matters*" or "*private benefits of control*" argument.

In addition, Morck and Yeung (2003) classify Australia as an *in-between* country in terms of its description of the role families play in corporate control. That is, Australia is different to the U.S. and to Thailand as it has a large mixture of firms that are widely-held as well as a significant number of firms that are controlled by families. Extant research provides mixed results on the impact of family control on leverage, possibly because of the focus of these studies, that is, examination of firms in environments where there is a prevalence of family domination and control (i.e., Thailand) or where there is a prevalence of widely-held and professional manager control (i.e., U.S.). This study addresses the gap by examining firms in an *in-between* or mixed environment.

Second, this study extends empirical analyses of capital structure of family and non-family controlled firms beyond only an examination of leverage, and also investigates debt maturity and leasing decisions of Australian listed companies. Mishra and McConaughy (1999) and Anderson *et al.* (2003) studied the capital structure of family and non-family controlled firms in the U.S. whereas Wiwattanakantang (1999) examined family controlled firms in Thailand. However, these studies only focused on leverage. As such, there is no existing study that compares the debt maturity and leasing decisions of family and non-family controlled firms.

Third, this study contributes to the capital structure literature by explicitly acknowledging that financing decisions concerning the level and composition of debt are made simultaneously. Existing research typically focuses on one specific aspect of capital structure, such as leverage, debt mix, debt maturity structure or leasing decisions. However, firms may use more than one of these components simultaneously to reduce information and incentive problems. Barclay *et al.* (2003), for instance, show that leverage and debt maturity are jointly determined. They argue that if aspects of capital structure are jointly determined, treating them as exogenous variables might lead to biased and inconsistent parameter estimates. To avoid these conceptual and econometric problems, this study examines leverage, debt maturity and leasing decisions by using simultaneous equation procedure. Specifically, the study focuses on how interactions among capital structure variables are moderated by the uniqueness of family control.

Fourth, this study employs panel data methodology to test hypotheses. By using panel data, unobserved variables are taken into account and therefore any omitted variable bias is minimised. In addition, panel data provide more informative statistics, more

variability, less collinearity among variables, more degrees of freedom and more efficiency in the estimation procedure (Baltagi, 2002). Overall, panel data methodology increases the internal validity of the study. To date, Anderson and Reeb (2003b) are the only researchers who use panel data methodology in the context of family business and leverage.

1.2 Main Findings

The econometric analysis in this study produces several important findings. First, family controlled firms in Australia have higher levels of leverage than their non-family counterparts, suggesting that the families' incentive to use debt as a means of concentrating voting power outweighs their incentive to use debt as a means of reducing bankruptcy risk. The result is consistent with the view that comparatively large firm-specific human capital and private benefits of control are likely to exist in family controlled firms. Additional analyses show that the desire to use debt to concentrate control is stronger for smaller family firms and family firms operating in the mining sector, a sector hypothesised to have large private benefits of control. The results are insensitive to alternative estimation techniques, alternative measures of leverage, and are robust to concerns of nonspherical disturbances and outliers.

The impact of family control among Australian firms is similar to that experienced by firms in Thailand (Wiwattanakantang, 1999). Due to weaker investor protection, family firms in Thailand have a stronger desire to consolidate control and therefore use more debt (Claessens and Fan, 2002). Similarly, the results of this study indicate that Australian family firms use more debt than non-family firms. This result is contrary to Claessens and Fan's property rights argument. Claessens and Fan argue that in

countries with stronger investor protection, such as Australia, the desire to control should be lower, and therefore, Australian family controlled firms should employ lower leverage.

However, the leverage decisions of family firms in Australia are more consistent with the argument propounded by Bebchuk (1999), who provides the private benefits of control hypothesis. Bebchuk suggests that comparatively large private benefits of control are likely to exist in family controlled firms, and therefore, families have a stronger desire to control. As debt can be used to concentrate voting power, family firms employ more debt.

Second, family controlled firms use debt structure to reduce the probability of financial distress. Financial distress can be very costly for family shareholders because it adversely affects their financial and human capital. More importantly, financial distress generally leads to a shift in control from family to lenders. If this happens, families lose private benefits of control of their firms. This fear of losing control motivates families to reduce firm risk by using longer term debt and higher proportions of lease contract. The results are again insensitive to alternative estimation techniques, alternative measures of debt maturity or leasing, and are robust to concerns of non-spherical disturbances and outliers.

Third, results from the simultaneous equations analyses demonstrate that the bi-directional relationships among leverage, debt maturity and leasing decisions are generally statistically significant. This suggests that various components of capital structure are chosen simultaneously to reduce incentives and information problems. In particular, the study finds that family firms use leverage, debt maturity and leasing

interchangeably to reduce the agency costs of debt. The family's interest in the firm's long-term survival and concern for their reputation motivates family firms to limit any actions that destroys firm value. As indicated by agency theory, risk shifting and underinvestment are actions intended to expropriate value from debtholders. However, sophisticated debtholders anticipate these actions and adjust the interest rate accordingly. As a result, costs associated with the shifting of risk and underinvestment is borne by shareholders. This motivates shareholders to control the problem and one way to reduce this problem is through capital structure choices (i.e., leverage, debt maturity and leasing decisions).

Overall, the study supports existing theory that incentive structures of family firms differ from that of non-family firms. However, this unique incentive structure affects capital structure decisions in different ways. When choosing the level of debt, the family's desire to maintain control is stronger. In contrast, the incentive to reduce bankruptcy risk is more prevalent when families decide the type of debt (i.e., the maturity of debt and the priority of debt). Finally, families are motivated to reduce the agency cost of debt when the decisions related to interactions among capital structure variable are made.

1.3 Organisation of the Study

The remainder of this study comprises eight chapters. Chapter 2 is a review of theories and evidence related to family business and capital structure. A discussion of the theory of the firms precedes the discussion of family business and capital structure. In particular, the theory of the firm is reviewed through the prism of agency and

incomplete contract framework. Implications for family business and capital structure theories are also examined.

The literature review in Chapter 2 is further developed to become testable hypotheses in Chapter 3. In particular, the chapter identifies the uniqueness of family firms. Subsequent discussions examine how differences in incentive structures between family and non-family firms affect leverage (Hypothesis 1), debt maturity (Hypothesis 2), leasing decisions (Hypothesis 3) and interactions among capital structure decisions (Hypothesis 4).

The research design, methodology and procedures employed in this study are described in Chapter 4. This chapter identifies the internal validity threats to the non-experimental design procedures used in this study and the concomitant solutions employed to increase internal validity. The chapter also discusses sample, data and validation procedures, empirical model and panel data methodology used in the study.

Chapter 5 documents the descriptive and univariate analysis related to the data set. In particular, parametric and nonparametric tests are employed to examine whether capital structure and financial characteristics of family firms differ from non-family firms.

Chapter 6 discusses the association between family control and leverage. Specifically, various regression techniques are utilised and conducted to examine the hypotheses. The objective is to observe whether the impact of family control on leverage remains robust after controlling for problems associated with heteroskedasticity, autocorrelation, measurement error, omitted variable bias, outliers and survivorship bias.

The impact of family control on debt structure is analysed in chapter 7. The methodology used in this chapter is similar to that employed in the leverage analysis. The chapter is divided into two main sections: the first section reports the results of the relationship between family control and debt maturity while the second section discusses the impact of family control on leasing.

Chapter 8 presents the empirical testing of the impact of family control on the interactions among capital structure decisions. As firms might use leverage, debt maturity, and leasing decisions simultaneously to reduce information, incentive and financial distress problems, a three stage least square (3SLS) estimator is used to estimate the simultaneous equation.

Chapter 9 summaries the entire study. It also explains the implication and limitation of the study. The avenues for future research, particularly in the family business and capital structure literature are explored and the chapter ends with the conclusion of this research.

CHAPTER 2
FAMILY FIRMS AND CAPITAL STRUCTURE: THEORIES AND EVIDENCE

2.1 Introduction

As this study is primarily concerned with the impact of family control on capital structure decision making, the literature review is divided into two sections: family firm theory (section 2.3) and capital structure theory (section 2.4). Zingales (2000) argues that the foundation of corporate governance (also an important branch related to family business theory) and capital structure is the theory of the firm. Accordingly, a discussion of why the firm exists (section 2.2) precedes the discussion on theories of family business and capital structure. In particular, the theory of the firm is reviewed through the prism of agency and incomplete contract perspectives. Their implications for family business and capital structure theories are also discussed. Section 2.5 provides a summary of the literature review.

2.2 Theory of the Firm

A pure analysis of the neoclassical price theory leaves almost no room for the firm (Foss *et al.*, 2000). The theory describes how markets may produce efficient outcomes. The question how organisations should be structured does not arise, because market-contracting perfectly solves all incentive and coordination issues. By assumption, firm behaviour (profit maximisation) is invariant to institutional form (for example, ownership structure).

Coase (1937) raised a very important question for neoclassical price theory: if price system is the ideal structure for carrying out economic coordination, why does so much economic activity take place outside the price system (i.e., within firms in which market transactions are replaced by centralised direction)? He then reasoned that there must be costs associated with using the market that can be eliminated by using the firm. These costs are known as *transaction costs*.

From Coase's initial insight, economists took the theory of the firm in two different directions. The first approach, *incomplete contracting/property rights model*, focuses on circumstances in which it might be *less* costly to organize production within a firm. A central question here is what factors might increase the transaction costs of organising activities through market transactions? One answer is opportunism in the presence of investments in specialised assets. The second approach, *the agency model*, stresses the importance of agency problems and how firms provide a mechanism to control this issue.

Foss *et al.* (2000) argue that each division of the theory of the firm concentrates on different kinds of transaction costs that Coase (1937) identified. They also maintain that these perspectives are complementary and should be integrated.

2.2.1 Incomplete contract/property rights model

If firms exist to reduce transaction costs, how does control of firm become a key factor? Williamson (1975) identified several characteristics of transactions that make it costly to organise through markets. Where these features apply, transacting parties might choose to administer such transactions within the firm. The most important feature is

what he called *the asset-specificity of investments*[1], which refers to the degree of difficulty in redeploying assets for other uses.

A relationship-specific asset is an investment made to support a given transaction. These assets are often essential for the efficiency of a particular transaction. However, a relationship-specific asset cannot be redeployed to another transaction without some sacrifice in the productivity of the asset or some cost in adapting the asset to the new transaction. The need to create relationship-specific assets transforms the relationship as the transaction unfolds. Before the relationship-specific investments are made, a party may have many alternative trading partners, which allows competitive bidding. But after the relationship-specific investments have been sunk, competitive bidding is no longer possible. That is, when a transaction involves relationship-specific assets, parties to the transaction cannot costlessly switch trading partners. This implies that investments in relationship-specific assets lock the parties into the relationship (Besanko *et al.*, 2004). Williamson (1985) has referred to this change as the *fundamental transformation.*

Asset specificity can take several forms (Williamson, 1985): site specificity (assets that are located in a particular area and cannot be moved easily); physical asset specificity (assets whose physical or engineering properties are specifically tailored to a particular transaction); dedicated assets (an investment in plant and equipment made to satisfy particular buyer) and human asset specificity (skills, know-how, and information acquired by people that are more valuable inside a particular relationship than outside it).

[1] Other terminologies normally used for *asset specificity* include *firm-specific investments* and *relationship-specific assets*. All these terminologies are used interchangeable in this study.

When a firm invests in a relationship-specific asset, *the quasi-rent* must be positive. The quasi-rent of relationship-specific assets equals the extra profit a firm gets when it deploys its assets for their intended use, as opposed to deploying those assets for their best alternative use. If quasi-rent is large, a firm loses a lot of its rent and it turns to its second-best alternative. In contrast, the profit the firm could get from using the generic asset in its best alternative and its next best alternative would be the same, and therefore, the associated quasi-rent would be zero (Besanko *et al.*, 2004).

The large quasi-rent opens the possibility for *hold-up problems* (Klein *et al.*, 1978) or *opportunistic behaviours* (Williamson, 1985). A trading partner holds up one particular firm by attempting to renegotiate the terms of a deal. Knowing that the asset cannot be used elsewhere without significant loss, the trading partner might force a firm to reduce the transaction price. In doing so, the trading partner grabs some of the returns of the investment that the firm hopes to earn.

The following simple example provided by Barney (2002) explains the hold-up and quasi-rent concepts. If Firm A invests in a special technology that can be used only in an exchange with Firm B, Firm A has made a transaction-specific investment. Firm B can, however, exploit the specific investment made by Firm A. The economic value of this exploitation can be as much as the difference between the value of this investment for its first best use and the value for its second best use. If the value of this investment is its highest use value (i.e., in the exchange between Firm A and Firm B) and is $10,000, and its next-highest value (i.e., in the exchange not between Firm A and Firm B) is only $500, then Firm B can appropriate economic value from Firm A up to $9,500 (project quasi-rent). As long as the value of the appropriation is less than $9,500,

it is still better for Firm A, which made the specific investment to continue in this exchange rather than cancel the exchange and thereby gain only $500.

Hold-up problems (or opportunistic behaviours) do not exist in a world of *complete contracts* (Klein *et al.*, 1978; Williamson, 1985). A complete contract stipulates each party's responsibilities and rights for each and every contingency that can conceivably arise during the transaction. Neither party can exploit weaknesses in the other's position while the transaction is in progress. However, boundedly rational[2] people cannot enumerate every contingency that might arise during the period a transaction is in effect. As a result, they write *incomplete contracts*. An incomplete contract does not fully specify the "mapping" for every possible contingency of rights, responsibilities, and actions. Virtually all real-world contracts are incomplete and therefore, there always exists a possibility of hold-up.

The possibility of hold-up can reduce incentives to invest in specific assets. The tendency to underinvest in relationship-specific assets causes problems because relationship-specific assets usually allow firms to achieve efficiency that cannot be achieved with general-purpose investments. When holdup problems lead to underinvestment in relationship-specific assets, the result is likely to be lower productivity and higher production costs (Besanko *et al.*, 2004).

The potential hold-up problems would encourage the contracting parties to integrate their operations into a single corporation (Blair, 1995). Blair provides a simple example to illustrate the relation between hold-up problems and the existence of firms. Suppose

[2] *Bounded rationality* refers to limits on the capacity of individuals to process information, deal with complexity, and pursue rational aims.

one party owns a coal mine and the other party owns a power plant built at the mouth of the coal mine designed to use coal from the mine. The two parties would probably find themselves in frequent disputes about the price and terms on which the coal is to be sold to the power plant. But if a single party owns both the mine and the power plant, the owner would maximise the joint return and not waste resources haggling over the terms of trade between the two units. In short, integration of activities into a single corporation occurs when renegotiation costs are high and when important relationship-specific investments exist.

While these theories are clear on the costs of transacting in the market place with incomplete contracts (i.e., hold-up problem), they are somewhat ambiguous about the benefits of integrating activities into a single firm. Grossman and Hart (1986) and Hart and Moore (1990) provide a more formal framework, referred to as a *property rights approach* to the theory of the firm. They view ownership of a firm as giving the owner *residual control rights* over the use of the firm's assets; that is, the right to use assets in whatever way the owner likes unless otherwise prohibited in a contract. In particular, the owner of an asset has the right to exclude others from its use (Bolton and Scharftstein, 1998). With this power, owners of particular assets have stronger bargaining positions in the distribution of quasi-rents from relationship-specific assets. Therefore, the benefit of ownership is to encourage parties to make investments in productive specific assets.

2.2.2 Agency model

Grossman and Hart (1986) define ownership as a residual control right, that is, the right to make decisions when not specified in a contract. With this right, owners have the

power to determine how assets are deployed. In short, in a property rights paradigm, ownership is synonymous with control. The property rights theory perspective also demonstrates how the distribution of control affects the division of surplus and hence economic decision-making.

Berle and Means (1932) add another important perspective on the theory of the firm by introducing the concept of *the separation of ownership from control*. Unlike the property rights paradigm, Berle and Means implicitly define ownership as claims made on the firm's residual cash flow (i.e., the cash flow that is available after paying other stakeholders). They observed that most U.S. corporations are owned by widely dispersed shareholders. Dispersed shareholders have a low incentive to monitor managers due to the free rider problem (i.e., a dispersed shareholder is not interested in monitoring because he/she bears all the monitoring costs and only shares a small proportion of the benefit). As a result, the effective control of corporations ends up in the hands of management.

The concept of the separation of ownership and control is the starting point for *agency theory*. In its paradigmatic version, the theory deals with the relationship between a principal (e.g., the shareholder) and an agent (e.g., the manager) who works on a well-defined task.

An analysis of the agency problem is based on two fundamental behavioural assumptions (Barnea *et al.*, 1980). First, all individuals are assumed to choose actions that maximise their own personal welfare. As a consequence, as decision-making authority is delegated by the principal to an agent, agents use this power to promote

their own well being. Actions chosen by agents to achieve this goal may or may not be in the best interest of the principal. Second, individuals are assumed to be rational and capable of forming unbiased expectations regarding the impact of the agency problem and its associated effect on the future value of their wealth. Rationality implies that every individual recognises the self-interest motivations of others. In other words, future decisions by agents are based on their own self-interest and these decisions are anticipated and taken into account by the principal.

Another basic assumption in agency theory is that some information asymmetry exists between the principal and the agent, so that the principal cannot directly observe the activities of the agent or that the agent knows some other aspect of the situation which is unknown to the principal. As the interest of principals and agents are sometimes misaligned, agents might maximise their self interest even at the expense of principals. The problems due to this divergence of interest are referred to as the agency problem.

From its roots in information economics, agency theory has developed along two lines: positivist and principal-agent (Jensen, 1983). The two streams share a common unit of analysis: the contract between principal and agents. They also share common assumptions about people, organisations and information. However, they differ in their mathematical rigor, dependent variable, and style (Eisenhart, 1989).

The focus of the principal agent literature is on determining the optimal contract between the principal and the agent (Eisenhart, 1989). In the case of unobservable behaviour (due to moral hazard or adverse selection), the principal has two options. One is to discover the agent's behaviour by investing in information systems such as budgeting systems, reporting procedures, board of directors, and additional layers of

management. Such investments reveal the agent's behaviour to the principal and the situation reverts to the complete information case. The other option is to contract the outcomes of the agent's behaviour. Such outcome-based contracts motivate compliance of behaviour by coalignment of the agent's preferences with those of the principal, but at the price of transferring risks to the agent.

Positivist researchers, pioneered by Alchian and Demsetz (1972) and Jensen and Meckling (1976), have focused on identifying situations in which the principal and agent are likely to have conflicting goals and then describing governance mechanisms that limit the agent's self-serving behaviour. Positivist researchers have focused almost exclusively on the special case of the principal-agent relationship between owners and managers at large, specifically in public corporations.

Alchian and Demsetz (1972) explain that firms exist because of team production. Team production is a situation in which two (or more) people can produce more when they are working together than when they are working separately. The problem is that people working in teams and sharing the proceeds of their work will put in lower levels of effort than persons who are self-employed. This phenomenon is called *shirking*. Every team member will be tempted to engage in shirking and therefore, the total output of the team will be much lower than if there was no shirking.

According to Alchian and Demsetz (1972), a solution to the shirking problem is to appoint a monitor. If the monitor is to be effective, he/she must have the power to revise the terms the contract of individual team members. The monitor must have the right to terminate contracts with team members, to attract new team members and to adjust wage rates of every team member. Finally, the monitor also must have the right to sell

his/her rights as monitor. In other words, the monitor is the owner of the firm; he/she receives the residual, has the right to sell his/her firm, has the right to hire and fire team members, and to adjust their wages individually (Douma and Schreuder, 2003). In short, Alchian and Demsetz argue that the firm primarily exists as a solution to moral hazard behaviour in team productions.

Jensen and Meckling (1976) developed a theory on how ownership structure of the firm affects the behaviour of managers of firms. They argue that firms are simply legal fictions, which serve as a nexus for a set of contracting relationships among individuals. In particular, firms should be viewed as contracting mechanisms between the providers of capital (the principals) and managers (the agents) designed to minimise the agency costs of this relationship.

Jensen and Meckling break down agency costs into three components: first, by monitoring the principal's expenditure; second, bonding expenditure of the agent, and third, the residual loss. Monitoring expenditures are paid by the principal to regulate the agent's conduct. Bonding expenditures are created by the agent to ensure that he/she will not take actions which damages the principal. The residual loss is the value of the loss by the principal from decisions by the agent, which deviate from decisions made by the principal if he had the same information and talents as the agent.

It is important to recognise that the contracting parties bear the agency costs associated with their interaction and therefore have the incentive to structure contracts to reduce agency costs wherever possible (Smith, 1990). Contracting parties gain from forecasting accurately the action to be undertaken and structuring the contracts to facilitate the expected actions. For example, with competitive and informationally efficient financial

markets, unbiased estimates of agency costs should be included in the price of securities when they are initially offered (as well as at any future date). This mechanism provides incentives to structure contracts and institutions to lower agency costs.

Jensen and Meckling (1976) particularly concentrated on models which analysed the impact of conflict between managers and shareholders and conflict between shareholders and debtholders on issues related to optimal capital structure. In essence, Jensen and Meckling argue that optimal capital structure is determined at the point where the marginal benefit of using debt to control manager-shareholder conflict intersects with the marginal cost of shareholder-debtholder conflict. This is explored in more detail in Section 2.4 (Capital Structure Theory).

In the mid-1980s researchers in the U.S. began to uncover that a significant proportion of large corporations were not widely-held firms (Holderness, 2003). In other words, concentrated stock ownership is quite prevalent among large corporations. These findings led to the concept of ownership structure, which is the most important factor that determines the nature of the agency problem (Capulong *et al.*, 2000). That is, ownership structure affects whether dominant conflict is between managers and shareholders, or between controlling and minority shareholders.

The first aspect of ownership structure that emerges in the finance literature is ownership concentration. The degree of ownership concentration in a company determines the distribution of power between its managers and shareholders. When ownership is dispersed, shareholder control tends to be weaker because of poor shareholder monitoring. The primary agency problem in this type of firm is conflict between shareholders and managers. When ownership is concentrated, on the other

hand, large shareholders play an important role in monitoring management. However, a fundamental problem in corporate governance under concentrated ownership is how to protect minority shareholders from expropriation by controlling shareholders. Controlling shareholders might act in their own interests at the expense of minority shareholders and other investors (Capulong *et al.*, 2000).

A second key aspect of corporate ownership structure is its composition, namely, the make up of its shareholders. A shareholder can be an individual, a family or family group, a holding company, a bank, an institutional investor such as a finance company, an insurance company, an investment company, a pension fund, or a mutual fund, or a non-financial corporation. Capulong *et al.* (2000) argue that a family would more likely be interested in the control benefits as well as profits, whereas an institutional investor is more likely to be interested only in profits. In short, each type of large shareholder has different incentives and motives (Holderness and Sheehan, 1988; Gugler, 2001), which provides a fundamental argument used in the context of this study.

2.3 Family Business Theory

The previous section reviewed literature related to theory of the firm from two points of view: the incomplete contract and the agency perspectives. In this section, these perspectives are applied to family business and capital structure theories. In particular, the opposing views on advantages to family business are discussed through the prism of agency and incomplete contract theories.

2.3.1 Incomplete contract/property rights perspective

Zingales (1998) outlines a theory of corporate governance based on the incomplete contract paradigm discussed in Section 2.2.1. He argues that any governance mechanism such as family control, allocation of ownership, capital structure, managerial incentive schemes, takeovers, boards of directors, pressure from institutional investors, product market competition, labour market competition, organisational structure, etc., can all be thought of as institutions that affect the process through which quasi-rents are distributed.

In a perfect market it is assumed that agents can costlessly write all state-contingent contracts. As a result, all decisions are made *ex-ante* and all quasi-rents are allocated *ex-ante*. Thus, there is no room for governance. However, due to bounded rationality all contracts are most likely to be incomplete. That is, the contract does not fully specify the division of surplus in every possible contingency. As a result, there is a need for a complex set of constraints that shape the *ex-post* bargaining over the quasi-rents generated in the course of a relationship (i.e., governance system).

In short, Zingales (1998) proposes two necessary conditions for a governance system. First, the relationship must generate some quasi-rents. In the absence of quasi-rents, the competitive nature of the market will eliminate any scope for bargaining. Second, the quasi-rents are not perfectly allocated *ex-ante*. If they were, then there would be no scope for bargaining either.

Another important concept in the incomplete contract model is the residual rights of control introduced by Grossman and Hart (1986). In a world of incomplete contracts, it

is necessary to allocate the right to make *ex-post* decisions in unspecified contingencies. This residual right is both meaningful and valuable. It is meaningful because it confers the discretion to make decisions *ex-post*. It is valuable because this discretion can be used strategically in bargaining over the surplus.

The residual rights of control provide justification why shareholders should be in control (Zingales, 1998). The owner of a firm will generally be the party with the most expropriable investment (i.e., the owners quasi-rents are appropriable due to the hold-up problem). By contrast, productive assets (plant and equipment; human capital) of suppliers normally remain in the suppliers' possession. Thus, other stakeholders have a better outside option during the *ex-post* bargaining and they do not need the protection ensured through the residual rights of control. Therefore, control should be allocated to shareholders so as to maximise the incentives to make firm-specific investments.

Accordingly, it can be argued that family control is meaningful and valuable in the world of incomplete contracts for two reasons. First, families have two important types of investments in the firm, financial capital (which carries both a right to vote as a residual claimant and a right to the firm's cash flows) and human capital (which carries neither voting nor cash flow rights). It is the human capital portion which is appropriable (Cheung and Gaa, 1989). In order to protect this valuable firm-specific investment, families have to retain control.

Becker's (1964) classification of human capital suggests that the management function consists of three types of skills: generic skills, industry-specific skills and firm-specific skills. Generic skills form the basis of management function; all managers should have these skills, which can be transferred across all businesses and firms. A manager can

transfer industry-specific skills only to firms that operate in the same industry. In contrast, managers are unable to transfer firm-specific skills outside the firm (Harris and Helfat, 1997).

Firm-specific skills include an in-depth understanding of factors such as the company's history, culture, important personal business contacts and networks, the ability to garner the cooperation of the firm's workforce, and knowledge about local conditions and internal operations of the family business. It is firm-specific human capital that usually allows firms to achieve efficiency that cannot be achieved with general-purpose skills. Indeed, firm-specific skills may be the key success factor to firm competitiveness and performance. From the incomplete contract perspective, firm-specific investments generate so-called quasi-rents (i.e., the difference in an asset's value from the first to the second highest valuing user). Unfortunately, quasi-rents are potentially appropriable by others through hold-up or opportunistic behaviour (Klein *et al.*, 1978; Williamson, 1985).

The strongest threat to quasi-rents of firm-specific human capital comes from rent-seeking outsiders desiring control of the firm (Castanias and Helfat, 1992). If an outsider is able to takeover the company and dismiss the incumbent management, the incumbent management loses the rent that they expected to generate from investing in firm-specific human capital. Thus, firm-specific human capital is less valuable in other firms. Therefore, quasi-rents of firm-specific skills and decisions are at risk of appropriation by takeover raiders.

DeAngelo and DeAngelo (1985) argue that families hold majority votes in order to more firmly define their property rights and to maximise returns on their investments in

organisation-specific human capital. The benefit from managerial vote ownership in this case is substantially identical to that revealed by the standard economic analysis of the patent problem. As returns from innovation are potentially appropriable through future competition, the patent analysis indicates that reduced exposure to such competition yields benefits by encouraging investment in innovation. In a public corporation, vote ownership can shield incumbent managers from competition affected through vote accumulation by outsiders. Majority vote ownership can thus encourage managers to invest in organisation-specific capital, whose returns are potentially appropriable if outside stockholders can transfer control to another management group.

Another reason why family control is valuable is it is impossible to divide quasi-rents *ex-ante* in incomplete contract world. That is, incomplete contracts provide room for *ex-post* bargaining. By maintaining control, family shareholders have a strong bargaining position in dividing quasi-rents, which are closely related to the concept of *private benefits of control*.

Voting power that gives shareholders the capacity to influence management is used to consume corporate resources and to enjoy corporate benefits that are not shared with minority shareholders. Since the benefits only accrue to blockholders, they are called the private benefits of control (Barclay and Holderness, 1992).

Dyck and Zingales (2003) provide two good examples of how a controlling shareholder can simply transfer resources from the firm for his/her own benefit through self-dealing transactions. The "fair" transfer price of a certain asset or product may be subjective. As a result, small deviations from the "fair" transfer price might be difficult or impossible to verify in court. If these small deviations are applied to large trade volumes, however,

they can easily generate sizeable private benefits. Similarly, it is easy to disagree over who is the best provider of an asset or product when the relationship might involve considerations of quality and price.

The second example relates to the ability to get inside information from the firm and exploit business opportunities through other companies. Controlling shareholders usually have access to inside information. Some of this information may reflect potential opportunities in other more or less related areas. It is easier for a controlling shareholder to choose to exploit these opportunities through another company he/she is associated with, with no advantage for the remaining shareholders. The net present value of these opportunities represents a private benefit of control.

Other examples of private benefits of control are empire building, expense accounts and extravagance, inter-corporate loans at non-market rates, use of the firm's money and name to lobby politicians to promote controlling shareholders social and political agendas (Mayer, 2001). Many examples of private benefits of control are unique to family firms. For example, family control provides flexibility to hire family and relatives, to transfer firms to heirs and to enhance the family name (DeAngelo and DeAngelo, 1985; Anderson *et al.*, 2003). A common feature of these examples is that value is not shared among all the shareholders in the same proportion to the shares owned, but is enjoyed exclusively by the party in control. Hence, it is called private benefits of control (Dyck and Zingales, 2003).

Whether private benefits of control are socially beneficial or not is debatable. Ehrhardt and Nowak (2003) argue that any benefits of control not shared with minority shareholders gives controlling shareholders an incentive to deviate from the

maximisation of total firm value. Private benefits of control are cited as a source of the negative impact of family control on firm performance in East Asia (Faccio *et al.*, 2001; Claessens *et al.*, 2002). Due to poorly developed corporate governance systems in East Asia, private benefits of control in this region can be seen in the form of empires, cronyism, corruption and crime through mechanism such as zaibatsu firms in pre-war Japan, chaebols in Korea, excessive conglomeration in Indonesia etc. (Mayer, 2001).

Holderness (2003) argues that private benefits do not necessarily reduce the wealth of minority shareholders. For example, neither nonpecuniary benefits nor synergies in production that result if a corporation is the blockholder (a common situation) reduce the wealth of minority shareholders. Indeed, both of these private benefits could provide benefits to minority shareholders; both types of private benefits of control could, in other words, produce shared benefits of control. In addition, Grossman and Hart (1980) suggest that even if the extraction of private benefits generate some inefficiencies, its existence might be socially beneficial because its presence makes value-enhancing takeovers possible.

In the case of family firms, Mayer (2001) argues that the promotion and protection of the family name does not involve investor expenditure. They do not directly benefit investors, but they might encourage actions and activities that indirectly do so. Dennis and Dennis (1994) also argue that the desire to enhance the family name and to pass on enterprises to heirs can provide an important constraint on managerial self-dealing, enabling owners of these types of firms to realise large private benefits of control of their corporation without sacrificing the performance of a firm.

In short, from an incomplete contract perspective, family control exists because it protects valuable firm-specific human capital and it enables families to enjoy the private benefits of control. Whether family control is socially beneficial is still debatable because it has both advantages and disadvantages.

2.3.2 Agency perspective

Agency theory provides a mixed view on family firms. Jensen and Meckling (1976) theorise that agency costs are much lower in firms where the owners and managers are effectively the same party. This is because less monitoring of the owners' agents is needed. Therefore, family firms would be particularly efficient due to reduced agency costs. This assumption is so strongly held that the owner-managed firm is used as the zero agency cost base by finance researchers (Ang *et al.*, 2000). However, recent research suggests that agency issues in family firms are more complex than previously believed (Gomez-Mejia *et al.*, 2003; Steier, 2003). Specifically, entrenched ownership and asymmetric altruism within family firms create their own unique agency problems (Gomez-Mejia *et al.*, 2001; Schulze *et al.*, 2001).

The dispersion of ownership in larger corporations separates ownership from control, that is, shareholders delegate decision-making authority to managers. The separation of ownership from control leads to potential agency conflicts stemming from divergence of interest between managers and shareholders. Unfortunately, when ownership is dispersed, shareholder control of managers tends to be weaker. The inadequacy of shareholder monitoring is due to the so-called *free-rider problem* (Grossman and Hart, 1980). That is, small shareholders are not interested in monitoring managers because they bear all the monitoring costs and share only a small proportion of the benefits. As a

result, managers in widely-held corporations find it easier to pursue their interests even at the expense of shareholders.

The presence of large shareholders with greater controlling interest potentially solves the free rider problem. Since large shareholders have significant investments in the firm, they have an incentive to collect information and monitor management (Shleifer and Vishny, 1986). Large shareholders also have enough voting power to put pressure on management to act in the interest of shareholders (La Porta *et al.*, 1999). Therefore, large shareholders have both the power and incentive to monitor managers.

Large shareholders can be families, government(s), institutional investors or banks. Given the significant investment in firms, all types of large shareholders should have the power and incentive to monitor managers. However, as noted by Tufano (1996) and Gugler (2001), each type of large shareholder may have different incentives and motivations (i.e., the identity of investors matters). The theoretical work of Gorton and Kahl (1999) shows that families are better monitors than other types of large shareholders. There are at least three reasons for this.

First, families deal with their own money in the firms they control. In his classic book *The Wealth of Nations,* Adam Smith (1776[3]) argues that:

> *" The directors of such [joint-stock] companies however, being the* ***managers of other people's money rather than of their own,*** *it cannot well be expected that they should watch over it with the same anxious vigilance with which partners in a private copartnery frequently watch over their own "*

[3] Quoted from Canan, E. (ed), 1961, An inquiry into the nature and causes of The Wealth of Nations, University Paperbacks : London

Smith maintains that a necessary and sufficient condition for good monitoring is whether "monitors" watch "their own money" or not. Families certainly meet this condition as their wealth is strongly linked to the continuation of their companies, and therefore, they have a stronger incentive to monitor managers than dispersed shareholders.

Second, families are interested in the firm's survival as they often hold undiversified portfolios and because they seek to pass the firm to their heirs. Anderson and Reeb (2003a) argue that families view their firms as an asset to bequeath to family members or their descendents rather than wealth to be consumed during their lifetime. Specifically, family interests lie in passing the firm as a going concern to their heirs rather than merely passing their wealth. A firm's survival is thus a very important concern for families, suggesting that relative to other large shareholders, they potentially have longer time horizons and are more likely to ensure that managers maximise firm value.

Third, families usually control agency conflicts by placing their members in top management positions (Fama and Jensen, 1983; DeAngelo and DeAngelo, 1985; Denis and Denis, 1994). With family involvement in top management, there is greater alignment between the interest of shareholders and managers. The implicit contract among family members discourages managers from abusing their power and transferring corporate funds to themselves (Fama and Jensen, 1983). Severe misconduct leads to risk of dismissal from the job but also the risk of expulsion from the family. These penalties are drastic and form an effective deterrent to serious malfeasance (Pollak, 1985). Moreover, monitoring and disciplining managers in family controlled firms is potentially efficient because family members have excellent information about

the firm (Dennis and Dennis, 1994; Smith and Amoako-Adu, 1999). The uniqueness of these family rewards and sanctions are not open to other institutions (Pollak, 1985).

In short, the nature of agency relationships in family firms is characterized by *altruism*. Altruism is a trait that positively links the welfare of an individual to the welfare of others (Becker, 1981). Altruism enables families to sacrifice their current consumption for the welfare of their own children or grandchildren. This dynastic consideration gives family firms direct, long-term interest for the benefit of the family's well being (Pollak, 1985). Altruism also increases communication and cooperation within the family firm, thereby potentially reducing information asymmetries among family agents and increases their use of informal agreements (Daily & Dollinger, 1992).

Gorton and Kale (1999) argue that institutional investors are basically synthetic large investors created by small investors in order to mimic the advantages of family control. Since institutional investors are run by professional managers, they are also agents with their own sources of agency conflict (Black, 1992). In certain types of institutional investors, such as public pension funds, this problem can be severe. Because public pension funds are often managed by officials with their own personal agendas, such as public office campaigners, their goals often do not maximise shareholder value (Romano, 1993). Therefore, institutional investors might encounter the "who monitors monitor problem" (Alchian and Demsetz, 1972) or "agents watching agents problem" (Black, 1992). A similar argument can be applied to governments.

Empirical evidence in the U.S. tends to support the argument that families are better monitors than other types of large shareholders. For example, Anderson and Reeb (2003a) and McConaughy *et al.* (1998) compared the performance of large family and

non-family controlled firms and found that family controlled firms outperformed their non-family counterparts. Both McConaughy *et al.* and Anderson and Reeb argue that the results are consistent with the argument that founding-family firms have incentive structures that result in low agency costs.

While the argument that family firms reduce agency costs appears to be well reasoned, findings from recent empirical research question this view. Studies by Schulze *et al.* (2001) and by Gomez-Mejia *et al.* (2001) suggest that family businesses actually incur higher agency costs compared to non-family enterprises, since families are unwilling to fire incompetent family members.

Gomez-Mejia *et al.* (2001) compared the performance of Spanish media firms from 1966 to 1993. They discovered significant costs were incurred by family-owned firms as these firms were more reluctant to fire family CEOs. However, when such action was taken, the family firm's performance improved significantly. Gomez-Mejia *et al.* conclude that families are reluctant to strictly monitor, discipline, or fire family CEOs because they are family members.

Schultze *et al.* (2001) argue that the agency problem in private family firm is more difficult to manage because of self-control and other problems engendered by altruism. They argue that private ownership insulates the firm from the disciplining role of external markets (i.e., market for corporate control and labour market). In addition, altruism negatively affects family firms. The parents' increased generosity causes their children to free-ride (i.e., squander their parent's money). This agency threat is likely to be more pronounced in family firms, because control over the firm's resources makes it

possible for owner managers to be unusually generous to their children and relatives. Schultze *et al.*'s (2001) empirical results support this hypothesis.

Morck and Yeung (2004) explain other characteristics of family firms that might destroy firm value. They argue that family blockholders improve corporate governance in the United States and United Kingdom because they have large fortunes tied up in the firm, thus decreasing the likelihood of mismanagement. Legal protection in the U.S. and the U.K. is strong and prevents family firms from expropriating minority shareholders. Many family firms, especially in East Asia, employ control pyramid structures[4] which allow families to control numerous firms without investing too much of their own wealth in each firm – conglomeration phenomenon. These structures create the same incentive problems which occur in widely-held firms. Insiders (such as the family) rather than professional managers spend outside shareholders' money on things they desire rather than on things that build firm value. This is a result of weak investor protection in East Asia.

Several empirical studies support Morck and Yeung's (2004) argument. Claessens *et al.* (2002) investigate the role of pyramid structures in East Asian corporations. They find that firm value falls when the control rights of family shareholders exceed cash-flow ownership. Lins (2003) reproduced Claessens *et al.*'s research in emerging economies and found that the effect of pyramid structures was weaker in countries with better legal protection.

[4]The concept of pyramid structure can be easily understood by using Fan and Wong's (2002) example. An entrepreneur owns 25% of the stock in publicly traded Firm A, which in turn owns 32% of the stock in Firm B. In this case, the entrepreneur controls 25% of Firm B—the weakest link in the chain of voting rights. However, the entrepreneur owns only 8% of the cash flow rights of Firm B, the product of the two ownership stakes along the chain. Given this ownership structure, it costs the entrepreneur only $8 for every $100 expropriated from Firm B.

In short, the literature suggests that agency costs might be a two-edged sword for family businesses. Family firms that have some objective standards for monitoring the performance of family managers and are willing to enforce discipline, might realise the advantage of lower monitoring costs since the goals of owners and managers are aligned. However, those firms that allow nepotism without providing adequate monitoring might be at a competitive disadvantage (Dyer, 2003).

2.4 Capital Structure Theory

In their seminal paper published in 1958, Modigliani and Miller (M&M) laid the foundations for modern capital structure theory, which is now famously referred to as the capital structure "irrelevance" proposition. Under a restricted set of conditions, such as no taxes, no financial distress costs, no agency problems and no information asymmetry, M&M show that the value of the firm is determined solely by investment decisions and is not affected by financing policy.

When deciding how to finance its operation, the firm must decide the composition of debt and equity, which is called a leverage decision. If the firm chooses debt, it must also decide whether the debt should be secured or unsecured (i.e., debt priority structure), short-term or long-term (i.e., debt maturity structure), privately placed or held by widely-dispersed public investors (i.e., debt mix), and other types of debt contracts. In short, capital structure decisions not only deal with how much debt to use (leverage decision), but also deal with what types of debt to use, including debt maturity decisions, debt mix decisions and priority structure decisions (Peirson *et al.*, 2002; Barclay *et al.*, 2003).

M&M's irrelevance propositions can be generalised to any mix of securities issued by firms. For example, it doesn't matter whether the firm is financed by debt or equity or whether debt is short- or long-term, private or publicly-held, callable or call-protected, straight or convertible, in dollars or euros, or some mixture of all of these or other types (Myers, 2001).

However, M&M's irrelevance propositions do not adequately explain the "real world". The continuous innovation in design of securities and in new financing schemes demonstrates that financing policy does matter (Myers, 2001). In addition, studies on the determinants of capital structure show that systematic factors influence the debt-equity ratio of firms (see Harris and Raviv, 1991).

Although M&M's irrelevance propositions do not adequately explain the real world, their propositions have considerable practical value by directing the search for factors that are likely to be important in selecting an optimal corporate capital structure. As Miller (1988, p.7) notes " ..... showing what doesn't matter can also show, by implication, what does." In other words, Miller argues that leverage, debt maturity, debt priority structure, debt mix and other types of capital structure decisions do not affect firm value ***except*** for specifically identified costs or imperfections such as taxes, financial distress costs, agency problems and information costs. The impact of these factors on each capital structure decision is discussed in the following sections. Due to Australian data availability constraints, this study focuses on three capital structure decisions: leverage, debt maturity and leasing decisions (which represent the priority structure of debt)[5].

[5] For example, it would be interesting to study debt mix (i.e., the proportion of public debt to private debt) and security issue decisions. Unfortunately, not many public companies in Australia issue public debt.

2.4.1 Leverage

Leverage decisions refer to the firm's choice for the composition of debt and equity. Relaxing different subsets of M&M's assumptions leads to two important theories of leverage: the trade-off theory and the pecking order theory. The trade-off theory emphasises taxes, financial distress costs, and agency problems, whereas the pecking order theory emphasises information asymmetry problems.

The trade-off theory maintains that when leverage increases there are several opposing forces at work. On the one hand, there is an increase in the tax advantage and a reduction in the agency cost of equity. On the other hand, there is an increase in the present value of expected financial distress and agency costs of debt. Consequently, there might be an optimal amount of debt where the marginal benefit of debt is exactly equal to the marginal cost of debt.

Unlike the trade-off theory that believes in the existence of an optimal capital structure, the pecking order theory does not rely on the concept of a target debt-equity ratio. Myers (1984) argues that information costs associated with issuing securities are so large that they dominate all other forces that determine optimal leverage in the trade-off model. The pecking order theory recognises that firm managers follow a distinct order in their preferences for financing sources and therefore, a company's observed capital structure simply reflects its past pecking order preferences for capital requirements.

Taxes and Leverage - Under a classical tax system, interest is a tax-deductible expense while dividends and retained earnings are not. A taxpaying firm that pays an extra dollar of interest receives a partially offsetting interest tax shield in the form of lower taxes

paid. Financing with debt instead of equity, therefore, increases the total after-tax dollar return to debt and equity investors, and should increase firm value (Myers, 2001). This suggests that companies with higher tax rates should employ higher leverage.

The imputation tax system, which was introduced in Australia in 1987, eliminates the double taxation of dividends (Peirson *et al.*, 2002). This system provides shareholders with a credit for the income tax paid by a company and therefore the company's profits distributed as dividends are effectively taxed only at the personal level. In the context of capital structure, the imputation tax system tends to remove any tax-related bias towards the use of debt finance by companies.

A theoretical framework developed by Howard and Brown (1992) shows that the dividend imputation system could be neutral or even biased against debt financing, depending upon personal and corporate taxes. Twite (2001) argues that after July 1988, individual investors prefer equity to debt financing. Since only realised capital gains and losses are taxed, the effective capital gains tax rate is less than the statutory tax rate on dividend payments. The implication is that an individual investor prefers unfranked dividends to be retained producing capital gains for investor. Assuming firms adopt an optimal dividend policy, Twite shows that the value of $1 of equity income distributed via franked dividends and capital gains has a higher value than $1 of debt income.

Financial Distress Costs and Leverage - When leverage increases, the value of a company increases as a result of the tax advantages of debt. Gradually, however, the prospect of financial distress and bankruptcy become increasingly important (Ogden *et al.*, 2003). A firm incurs several deadweight costs when its financial position weakens,

even if the firm does not declare bankruptcy. These are called costs of financial distress. Bankruptcy involves additional deadweight costs.

Ogden *et al.* (2003) argue that any loss of value that can be attributed to a firm's deteriorating financial strength is a cost of financial distress. They provide several examples of financial distress costs. The greatest cost of financial distress for a firm is loss of competitiveness, which occurs for several reasons. First, the firm is forced to pass up valuable projects because it lacks internal financing and has little or no access to external capital markets. Second, distressed firms are forced to sell valuable assets, subsidiaries, or divisions to shore up their liquidity. Third, its competitors push new products or lower prices in an effort to financially squeeze the distressed firm out of business.

A distressed firm is forced to renegotiate contracts with its suppliers, employees, customers, and creditors. Suppliers want prompt payment and continued business. They generally are willing to provide trade credit, but only to financially secure buyers. In an industry with few suppliers, a distressed firm is forced to pay higher prices to its suppliers to compensate for higher risk, and is denied trade credit. Employees demand higher wages or salaries to compensate for the heightened risk of losing their jobs. If the distressed firm is unable to comply, it loses many good employees, and thereby incurs additional losses in terms of lost workforce talent and experience. Customers generally demand warranties and after sales service. Their long-term availability is in question for a distressed firm. Therefore, buyers either demand compensation in the form of lower prices, or buy the product elsewhere. A distressed firm also loses valuable relationships with its creditors. For instance, a bank that has provided a line of credit to the firm

might cancel the line in the face of the firm's financial distress. Alternatively, the firm is forced to accept unfavorable terms in debt renegotiations.

Empirical studies indicate that the cost of financial distress is likely to be significant (see Altman, 1984 for U.S. evidence; and Pham and Chow, 1987 for Australian evidence). More recently, Andrade and Kaplan (1998) studied a sample of highly leveraged companies that fell into financial distress. They estimated that the costs of financial distress averaged 10 percent to 20 percent of firm value. They also found that most of the costs of financial distress occurred before bankruptcy was declared.

Direct costs of financial distress (or bankruptcy) represent the costs incurred in terms of cash outflows at the time of bankruptcy. Additional costs include legal costs, administrative costs, and the value of managerial time spent in administering bankruptcy. Empirical studies indicate that the direct cost of bankruptcy is likely to be small (see Warner, 1977 for U.S. evidence; Robertson and Tress, 1985 and Pham and Chow, 1987 for Australian evidence).

Agency Costs and Leverage - Jensen and Meckling (1976) argue that the value of the firm is not fixed, as M&M assume; rather it depends on the conflict of interest between various parties in the firm. Managers might consume perks that reduce firm value and therefore negatively affect shareholders. In this case debt can be used to discipline managers. However, borrowing becomes costly when debt levels increase as managers (on behalf of shareholders) have an incentive to engage in excessively risky investments. If this excessively risky project succeeds, most benefits go to shareholders; whereas if the project fails, the losers are the firm's creditors. Accordingly, debtholders increase borrowing costs to anticipate this action. In short, Jensen and Meckling argue

that the optimal debt-equity ratio or the firm's capital structure is determined at the point where the marginal benefit of controlling managers' perks is offset by the marginal cost of anticipated risky behaviour.

Jensen and Meckling (1976) argue that a firm is a nexus of contracting relationships among individuals (i.e., factors of production). Since individuals tend to maximise their own utility, their objectives are not automatically aligned with the firm. In practice, conflict occurs between various parties in the firm including managers, shareholders, and debtholders. Two main agency problems potentially affect financing decisions: conflict between managers and shareholders and conflict between shareholders and debtholders.

Conflict Between Managers and Shareholders - When one person both owns and controls the company, there should be no divergence of interest between shareholders and managers. When firm size increases to the point where no individual or family has sufficient wealth to own a controlling interest, shareholders must delegate decision-making authority to managers. This separation of ownership from control provides an opportunity for managers to pursue their own objectives at the costs of shareholders. Managers in widely-held companies make investment, operating and financial decisions that are not aligned with shareholders' interest. Any small inefficiencies in these important areas can result in a significant loss in value for shareholders. This value reduction is referred to as the agency cost of equity financing. Table 2.2 summarises several possible actions that managers might take which leads to a reduction in firm value.

Table 2.1 Types of Manager-Shareholder Conflict

Problem	Description
Effort	Managers have less incentive to exert effort compared to the expectations of shareholders.
Horizon	Managers tend to have shorter horizons for achieving investment results than stockholders.
Differential risk preference	Managers typically have so much of their wealth tied to ongoing viability of the firm that they tend to be more risk averse than stockholders.
Asset use	Managers have greater incentives to misuse corporate assets or to consume excessive perks because they do not bear the full costs of such actions.
Overinvestment	Managers have both the incentives and the opportunities (i.e., excess cash flow) to undertake wasteful investment projects, even if it is detrimental to shareholders' interest.

Source: Modified from Byrd *et al.* (1998), p. 15.

It should be noted that managers can only pay their "excessive perks" if the firm has the cash flow to cover it. Similarly, entrenched managers may undertake wasteful investment projects if the firm has what Jensen (1986) refers to as "free cash flow" (i.e., cash flow from operations over which managers have discretionary spending power). In such circumstances, debt can add significant value because it reduces the managers' opportunity to waste the company's resources.

By issuing debt, managers are committed to using corporate cash flows for principal and interest payments. If these fixed claims are not paid as required, the firm is forced into bankruptcy, in which case managers are likely to lose their jobs. In addition, debt sometimes can force managers to divest unprofitable lines of business and cut wasteful costs.

Conflict Between Shareholders and Debtholders - The main source of agency conflict between shareholders and debtholders is the fact that shareholders are residual claimants on the assets of the firm and have limited liability, while debtholders hold a fixed claim.

This condition results in differences in the potential gains and losses available to both parties. Debtholders can lose an entire investment in the firm, but their maximum available return is limited to the full payments of interest and principal as scheduled. In contrast, the maximum loss for shareholders is limited to the amount they paid to the firm as equity capital, while their maximum return is unlimited. In other words, when there is debt in the firm's capital structure, its ordinary shares take on the economic characteristics of a call option written on the firm's assets (Black and Scholes, 1973).

Smith and Warner (1979) identify four major conflicts of interest between shareholders and debtholders, namely, the asset substitution problem, the underinvestment problem, claim dilution, and dividend payment. All four conflicts are closely related to financial distress (Myers, 2001) and hence, are usually included as indirect costs of financial distress. These conflicts are summarised in Table 2.3 below.

Table 2.2 Types of Shareholder-Debtholder Conflict

Problem	Description
Asset substitution	The value of the stockholder's equity rises while the value of the bondholder's claim is reduced by substituting projects which increase the firm's risk.
Underinvestment	A firm with outstanding bonds can have incentives to reject projects which have a positive NPV if the benefit from accepting the project accrues to the bondholders.
Claim dilution	The claim value of existing bond is reduced when the firm issues additional debt of the same or higher priority.
Dividend payout	Paying out a large cash dividend dilutes the existing bondholders' claim.

Source: Smith and Warner. (1979), pp. 118-119.

An interesting question regarding the agency cost of debt is who bears these costs? Prior literature is divided on whether stockholders or bondholders bear the agency costs of debt. Jensen and Meckling (1976) suggest that equity holders bear this cost, while

Barnea *et al.* (1980) suggest that bondholders bear the cost. Anderson *et al.* (2003) found evidence that these costs are born by shareholders through higher debt financing costs. This evidence is intuitively appealing because lenders realise that their wealth may be eroded by managers' decisions made in the interest of shareholders. Anticipating the losses they suffer, lenders require a higher interest rate. This means that the agency cost of debt is ultimately borne largely by shareholders. Therefore, it is in the shareholder's interest to control the agency cost of debt.

Asymmetric Information/Information Costs and Leverage - In corporate finance, asymmetric information refers to the notion that firm insiders, typically managers, have better information than do market participants with regard to the value of their firm's assets and investment opportunities. This asymmetry creates the possibility that the market will not price the firm's claims correctly, thus providing a positive role for corporate financing decisions (Klein *et al.*, 2002).

Ross (1977) applies Akerlof's (1970) argument through an illustration of the lemons market for used cars in relation to capital structure. Ross explains that managers with an informational advantage have an incentive to signal their private information through their choice of debt level. Firms with lower expected cash flows find it more costly to incur higher levels of debt (because bankruptcy is more likely) than firms with higher expected cash flows. Just as sellers of lemons find a large warranty too costly, managers of firms with lower expected cash flows find a relatively higher level of debt too costly because it imposes a higher probability of bankruptcy. Thus, higher-valued firms signal this information to the market by issuing a sufficiently higher amount of debt (Klein *et al.*, 2002).

Myers and Majluf (1984) and Myers (1984) develop a pecking order theory of capital structure based on the problem of adverse selection. Two main assumptions underpin this theory. First, managers are assumed to know more about the prospects of a company than do investors as they intimately know the day-to-day operations of the firm. Second, managers are assumed to act in the interest of existing shareholders. These assumptions imply that managers will prefer to issue securities if they are overvalued. Although outside investors are not as well informed as managers, they understand the managers' motives and thus will not buy securities until the price has fallen to a marginal level. This price reduction is interpreted as the information cost of issuing securities.

The information cost of debt is generally higher than that of equity. Debt has a higher priority claim on corporate cash flows, while equity represents the residual claim. Therefore, the value of debt is generally less sensitive to changes in a company's prospect than is the value of common stock. In general, riskier security issues result in larger price decreases because risk exacerbates the effects of asymmetric information. The empirical findings summarised by Smith (1986) are consistent with this prediction. The market's response to common stock issues is more negative than its response to hybrid securities or debt offerings.

Myers (1984) argues that information costs associated with issuing securities are so large that they dominate all other forces that determine optimal leverage in the tradeoff model. He argues managers will follow a distinct order in their preferences for financing sources that they fail to maintain an optimal capital structure. That is, managers always prefer internal to external financing. If external financing is required, managers will first prefer to issue the safest securities. Therefore, a company's observed capital structure

will simply be a reflection of its past pecking order preferences for capital requirements. This theory is known as the pecking order theory.

2.4.2 Debt Maturity

When companies choose to issue debt, they must decide on the maturity of the debt, that is, whether debt is to be short- or long-term. Stiglitz (1974) extended Modigliani-Miller's leverage irrelevance policy to debt maturity. Using similar assumptions, Stiglitz shows that debt maturity does not affect firm value in a perfect market. Subsequent literature identifies at least four debt maturity factors that affect firm value: taxes, financial distress, agency problems and asymmetric information. Each explanation is considered in turn.

Taxes and Debt Maturity - Brick and Ravid (1985) analysed the tax implications of debt maturity choice. They argue that the choice in debt maturity matters if the term structure of interest rates is upward or downward sloping. If the yield curve is upward sloping, the tax hypothesis implies that in the early years interest expense from issuing longer-term debt is greater than the expected interest expense from rolling shorter-term debt. In this case, Brick and Ravid (1985) argue that issuing longer-term debt reduces the firm's expected tax liability and consequently increases the firm's current market value. Conversely, if the term structure is downward sloping, issuing shorter-term debt increases firm value. Thus, the tax hypothesis implies that firms employ more longer-term debt when the term structure has a positive slope.

It seems that any tax advantages associated with the choice of debt maturity comes from deferral of the company's income tax. Peirson *et al.* (2002) and Bishop *et al.* (2004) argue that under the Australian imputation tax system, any tax advantage gained by deferring the company's tax payments will be insignificant because company tax is only a withholding tax from the viewpoint of resident shareholders. Consequently, any tax advantage gained from the choice of debt maturity must also be insignificant under the Australian imputation tax system.

Financial Distress and Debt Maturity - A common prescription in the literature is that a firm should match the maturity of its liabilities to that of its assets (Stohs and Mauer, 1996). If debt has a shorter maturity than assets, there is not enough cash on hand to repay the principal when it is due. Alternatively, if debt has a longer maturity, then cash flows from assets cease while debt payments remain due. Therefore, both alternatives expose the firm to default risk. Maturity matching can reduce these risks and is thus a form of corporate hedging that reduces the expected costs of financial distress. This argument suggests that debt maturity varies directly with asset maturity.

Similarly, Myers (1977) argues that maturity matching can control agency conflict between equityholders and debtholders by ensuring that debt repayments are scheduled to correspond with a decline in the value of assets in place. Chang (1989) demonstrates that maturity matching can minimise the agency costs of debt financing.

Agency Costs and Debt Maturity – Myers (1977) notes that short-term debt reduces the potential underinvestment problem because lenders and borrowers rewrite contracts before growth options are exercised. In addition, Barnea *et al.* (1980) argue that short-

term debt can also help alleviate the asset substitution problem. This idea follows the view that equity is an option on firm value. Barnea *et al.* argue that since shorter term options are less sensitive to changes in the variances of projects, short-term debt will diminish the shareholders' incentive to engage in low-value high–variance projects. In addition, short-term debt is less likely to be affected by changes in the value of assets as shorter-term options are less likely to be affected by the underlying asset.

Asymmetric Information/Information Costs and Debt Maturity - Flannery (1986) developed a theoretical model showing that firms use debt maturity decisions to signal value in an asymmetric information setting. In his model, Flannery assumes that two types of firms exist, that is, good firms and bad firms. The projects of "good firms" are highly profitable, and the projects of "bad firms" are less profitable. The managers of each firm are aware of the type of firm they operate, however, markets are unable to distinguish these firms until the end of the first reporting period.

If management of both firms would voluntarily reveal the type of firm they operate, markets would be able to correctly price the debt issues of each firm. However, moral hazard problems exist as managers do not voluntarily identify their firms as bad. Instead, they mimic the efforts of "good firms" and if they are successful, a pooling equilibrium is obtained in which the debt of all firms have the same maturity and price. The price reflects the average quality of these two types of firms. In this case, "good firms" sustain a net loss from the market's underpricing of their debt, whereas "bad firms" would enjoy a net benefit from the market's overpricing of their debt (Ogden *et al.*, 2003).

To avoid losses in the pooling equilibrium, "good firms" have an incentive to provide costly signals that "bad firms" are unable to mimic. In Flannery's model, "good firms" signal their quality by issuing shorter term debt. The cost of this signal comprises refinancing costs that firms otherwise avoid by issuing longer-term debt. If the cost of this signal exceeds the benefits from mimicking, "bad firms" opt out from the short-term debt market and instead issue long-term debt. A separating equilibrium for debt maturity results in "good firms" issuing shorter term debt while "bad firms" issue "longer term debt" (Ogden *et al.*, 2003).

In short, Flannery (1986) argues firms use short-term debt to signal managements' anticipated change in firm quality. Borrowers with favorable insider information avoid locking in their financing costs with longer-term debt, since they expect to be able to borrow under more favorable terms later.

2.4.3 Leasing

A lease is an agreement between a lessor and a lessee where the lessee makes periodic payments to the lessor in exchange for the use of the asset. Firms use leasing as an alternative to borrowing and buying capital equipment. Barclay and Smith (1995b) argue that leasing decisions are one of the decisions made on the priority structure of debt. They argue that lease liabilities generally have the highest priority in bankruptcy. That is, default on a promised lease payment typically gives the lessor the right to repossess the leased asset. More importantly, if the lessee files for bankruptcy, the court requires the lessee to continue to make specified lease payments to the lessor throughout the bankruptcy process while other debtholders, typically, are not paid until the bankruptcy process is resolved (Barclay and Smith, 1995b).

There are a variety of leases. The most common types are operating and financial leases. Operating leases are usually short-term and cancelable during the contract period at the option of the lessee. Financial leases extend over most of the estimated economic life of the asset and usually cannot be cancelled unless the lessor is reimbursed for any losses.

As in the case of other types of capital structure decisions, lease decisions have no impact on the firm's value under perfect capital market conditions. However, the literature shows that lease financing reduce agency problems and the premium on external funds that arises from severe asymmetric information. Leasing is also used to reduce the riskiness of the firm and to transfer tax shields. Therefore, leasing decisions add value to the firm.

Taxes and Leasing - Leasing contracts provide opportunities for lower tax-paying firms to transfer tax shields to higher tax-paying firms where the value of the tax shield is higher. That is, lower tax-paying firms or lessees benefit by paying lower lease payments. In this case, both the lessee and the lessor receive benefits from the leasing contract at the expense of government tax revenues. This tax based theory of leasing implies that companies with low effective marginal tax rates are likely to prefer leasing because it effectively allows the benefits of the tax shields to be shifted from the lessee to the lessor (Smith and Wakeman, 1985).

Peirson *et al.* (2002) and Bishop *et al.* (2004) argue that tax advantages of leasing come from the present value of delaying corporate taxes. Under the Australian imputation tax system, the company's income tax from the viewpoint of resident shareholders, is only a withholding tax on dividend payments. Thus, tax benefits from leasing under the

imputation system are small because of timing differences between unfranked dividend and the personal tax payments by shareholders.

Financial Distress and Leasing - Relative to other debt, leasing contracts have higher priority in bankruptcy (Krishnan and Moyer, 1994; Barclay and Smith, 1995b). In case of bankruptcy, the lessee is required to continue to make scheduled lease payments to the lessor, giving the lease priority on par with administrative expenses. In contrast, most debtholders, including those of secured debtholders, must await payment until the bankruptcy is resolved. Consequently, a firm with a high probability of financial distress is more likely to be able to arrange lease financing with more favorable terms than other forms of financing (Graham *et al.*, 1998). This theory implies that firms with higher probability of financial distress are more likely to lease.

Agency Problem and Leasing - More recent literature has focused on the relative ability of leasing to control agency costs. Smith and Warner (1979) showed that the issuance of secured debt limits the transfer of wealth from bondholders to stockholders. The security provision prevents firms from selling the collateral to pay a dividend or from exchanging the collateral for a more risky asset. This feature of secured debt protects secured creditors against the asset substitution problem.

In addition, Stultz and Johnson (1985) show that higher-priority claims assist in mitigating the underinvestment problem. An underinvestment problem occurs when the existing unsecured debt holders are the major beneficiaries of new investments, thereby discouraging stockholders from supporting the undertaking. Because the issuance of secured debt allows the firm to acquire new projects and segregates the claim on the

project's cash flow, it limits the extent to which debtholders can benefit from positive NPV projects. This, in turn, makes it more likely that shareholders will accept such projects, thereby mitigating the underinvestment problem (Masulis, 1988).

As mentioned before, the lessor continues to receive full compensation even after the lessee files for bankruptcy, while other creditors claims, including those of secured creditors, has no assurance of being met. Therefore, Sharpe and Nguyen (1995) and Barclay and Smith (1995b) argue that the financial contracting advantages of leasing to control for agency problems is even stronger than for secured debt.

Asymmetric Information/Information Costs and Lease Decision - Myers and Majluf (1984) suggest that when managers have more information than investors about the value of the firm, they tend to issue stock when they know it is overvalued and repurchase stock when it is undervalued. Knowing this, investors take managers' decisions to issue stock as a signal that the stock is overvalued and adjust its value downward. This high information cost of equity leads managers to reject some positive NPV projects that are accepted in a world with no informational asymmetries. Myers and Majluf demonstrate that if managers are able to issue safe debt, the adverse selection problem is largely mitigated. Therefore, a pecking order of financial securities arises in their model, where internal financing is the most preferred method of financing, followed by debt, then equity (Ezzell and Vora, 2001).

Sharpe and Nguyen (1995) argue that financing through leasing arrangements, firms effectively put financial obligations on par with other administrative expenses such as employees and management compensation, which have a higher priority than normal debt. This aspect of leasing makes it a highly desirable financial contract in the presence

of high asymmetric information, and therefore places leasing at the top of the peckin order of external financing. In short, firms that face higher costs of external capit should use leasing to reduce information costs.

2.5 Chapter Summary

This chapter is a review of literature related to theory of the firm from two points o view: the incomplete contract and the agency perspectives. These perspectives ar applied to family business and capital structure theories. In particular, the opposin views on advantages to family business are discussed through the prism of agency an incomplete contract theories. With respect to capital structure theories, four importan factors are identified that justify why leverage, debt maturity, and leasing decisio create value. These factors are taxes, agency costs, financial distress costs an asymmetric information. The theories explained in this chapter are used as the basis fo developing hypotheses in the following chapter.

CHAPTER 3
DEVELOPMENT OF HYPOTHESES

3.1 Introduction

The principal objective of this study is to empirically examine how differences in incentive structures between family and non-family firms affect capital structure decisions. In particular, this study seeks to address the following four research questions:

1. Is the leverage of family controlled firms different from that of non-family controlled firms?
2. Is the debt maturity of family controlled firms different from that of non-family controlled firms?
3. Are leasing decisions of family controlled firms different from that of non-family controlled firms?
4. Is joint determination of capital structure decisions (i.e., leverage, debt maturity and leasing) in family controlled firms different from that of non-family controlled firms?

The purpose of this chapter is to derive hypotheses to test these four research questions. Hypotheses for each research question are presented in separate sections: section 3.3 is concerned with leverage, section 3.4 debt maturity, section 3.5 leasing decisions and section 3.6 joint capital structure decisions. Before developing the hypotheses, differences in incentive structure between family and non-family firms are discussed in Section 3.2.

3.2 Uniqueness of Family Firms and Its Influence on Capital Structure Decisions

Families represent a special class of large shareholders that potentially have a unique incentive structure and power in the firm (Anderson *et al.*, 2003). There are two main characteristics that distinguish families from other types of large shareholders or managers of widely-held firms. First, families have a stronger desire to maintain control to protect their highly valuable private benefits of control and firm-specific human capital. Second, with substantial wealth and human capital at risk, family owners tend to be more risk averse than non-family owners. These unique characteristics of family firms potentially make their capital structure decisions different from those of non-family firms.

Families' Incentive to Control - Families usually have more personal wealth tied to the firm. Using *Forbes' Wealthiest Americans* database to examine family ownership and firm performance, Anderson and Reeb (2003a) found that on average, families have more than 69 percent of their wealth invested in the firm, which suggests that families both value and have an incentive to maintain control.

Modern finance theory emphasises the benefits of portfolio diversification. By holding several shares in a portfolio, investment risk can be reduced. Some of the risks simply cancel out when one company does poorly and another does well, bringing the portfolio into equilibrium. From the perspective of financial returns, there is no benefit to concentrated shareholdings (Mayer, 2001). The fundamental question is, what motivates families to forgo the benefits of diversification by concentrating their wealth into the stock of a single firm?

The literature review in Chapter 2 suggests that families concentrate their shareholdings and maintain control because of their desire to transfer business to heirs, to hire relatives, and to enhance the family name through the success of the firm. All these private benefits are enjoyed by families as long as they maintain the majority vote. Another reason is to protect firm-specific human capital from hold-up action initiated by outsiders.

Empirical evidence supports the argument that family owners have a greater desire to maintain control. Denis and Denis (1994) studied majority-owned firms in the US and found that owner-specific attributes (e.g., the identity of owners and their desire to control) is more important than firm-specific attributes (e.g., size and firm risk) in determining the choice of majority ownership. They conclude that majority ownership appears to be associated with individual owners and their desire to retain control, rather than with firm characteristics such as size or type of assets that makes majority ownership optimal. By maintaining majority control of the firm, family members protect their private benefits of control.

Empirical studies on dual class shares also support the conjecture that families have a stronger desire to control. In dual class recapitalisation, firms create second class common stocks that have limited voting rights and generally have a preferential claim to the firm's cash flows (Ogden *et al.*, 2003). DeAngelo and DeAngelo (1985) studied the characteristics of firms that adopt dual class shares in the U.S., whereas Taylor and Whittered (1997) investigated those in Australia. Both studies found that the majority of

dual class share firms were family controlled, indicating that families value control and issue non-voting stock to raise capital or provide liquidity without reducing control.

Differences in Risk Preferences of Family and Non-family Owners/Managers - One of the main sources of agency cost of equity in diffusely held corporations are differences in risk preferences between shareholders and managers. Treynor and Black (1976) show that managers and shareholders potentially bear different levels of risk. The typical shareholder in widely-held corporations generally holds a well-diversified financial portfolio. Thus, investment in one particular firm represents a relatively small portion of the individual's overall wealth. The advantage of this type of investment is that project failure in any one firm has a relatively small negative effect on the individual's wealth. Using portfolio theory terminology, diversification eliminates industry and firm-specific risk and therefore, a well-diversified investor is primarily concerned with systematic risk, not total risk.

Monsen and Downes (1965) argue that managers of widely-held firms face asymmetry in their reward structure. Managers' incomes are not identical with the firm's profits and do not vary in any strict manner to the firm's profits. In contrast, a firm's failure to achieve predetermined performance targets, or in the extreme case of bankruptcy, seriously harms managers' current and future employment (and therefore their future income).

Successful managers are able to move from firm to firm, commanding a salary on the basis of past performance. Good reputation has positive market value which is part of the manager's human capital (Milgrom and Roberts, 1992). For many managers, their

human capital is by far the most valuable asset they own because it affects future earning potential. Sutton and Callahan (1987) show that managers of bankrupted firms suffer substantial losses in reputation and self-esteem, indicating that financial distress is costly for managers. Gilson (1989) provides some evidence of the costs of financial distress for managers and reports that there is a higher probability that top executives lose their jobs. Moreover, he documents that none of the departing managers in his sample are placed in top positions at other publicly traded firms for three years.

The evidence provided by Sutton and Callahan (1987) and Gilson (1989) suggests that the costs of financial distress for managers are significantly high. Unfortunately, such risk cannot be effectively diversified by managers in their personal portfolios, since human capital is essentially nontransferable (Amihud and Lev, 1981; Milgrom and Roberts, 1992). Accordingly, managers tend to be more risk averse than shareholders of diffusely held firms.

Risk-averse managers have an incentive to diversify their employment risk by using a firm's investment and financial policies to reduce total risk of the firm. It should be noted that such actions may not necessarily be in the best interest of shareholders. Evidence tends to support the conjecture that managers tend to choose firm risk reduction strategies at the expense of shareholders. For instance, Amihud and Lev (1981) found that conglomerate mergers are more numerous when shareholdings are widely dispersed. In addition, recent evidence in the U.S. indicates that returns to shareholders from diversified corporations are significantly lower than those of undiversified firms in the same industry, and that shareholder returns decrease as firms become increasingly diversified (Lang and Stultz, 1994; Comment and Jarrell, 1994; Berger and Ofek, 1994).

The self-serving decisions by managers are relatively freely exercised in widely-held corporations due to the free rider problem. When ownership is concentrated, the controlling stockholders are generally able to exert a tighter control on managers' decisions and to assess whether the decisions are in the interest of shareholders. Thus, large shareholders are able to prevent managers' risk reduction strategies that are against the interest of shareholders. However, the actual control and action by controlling shareholders also depends on their degree of diversification.

Large shareholders such as institutional investors and the state are generally well-diversified and primarily concerned with systematic risk. Therefore, if they have an incentive to use their power, it is likely that they can minimise self-serving decisions driven by the risk preferences of managers. Friend and Lang's (1988) analysis suggests that the presence of large external shareholders limits management's discretion in seeking sub-optimal risk reducing strategies (i.e., lower debt levels).

In contrast, families have disproportionate amounts of their wealth invested in the firm, in the form of financial and firm-specific human capital and are therefore relatively undiversified (Short, 1994). Palia and Ravid (2002) argue that founders of family firms are characterised as persons with the 'best idea', whose value added is based on the match between the firm and the founder's special skill. This special skill attached to a certain firm is referred to as firm-specific human capital. The important attribute of this firm-specific human capital is its irreversibility, that is, a fraction of the value cannot be recovered by reselling. In addition, firm-specific human capital is less productive when used outside a particular firm. As a result, firm financial distress will put this human capital at risk.

Families usually not only have significant firm-specific human capital invested in the firm, but also have great personal wealth tied to the firm. Unfortunately, families cannot effectively diversify the risk of this investment due to financial constraints and therefore they often hold undiversified portfolios (Agrawal and Nagarajan, 1990). The combination of undiversified financial and firm-specific human capital suggests that family shareholders are more likely to be more risk averse than other types of large shareholders or managers of widely-held corporations.

3.3 The Impact of Family Control on Leverage

Debt financing is used to concentrate voting power as it avoids the dilution effect. Debt is also used to reduce firm risk as lower debt reduces the probability of bankruptcy. Therefore, it is argued that the families' desire to retain control and reduce risk will have an impact on their leverage decisions.

Leverage and Concentration of Control - Extant literature (e.g., Mayer, 2001; Burkart *et al.*, 2003) suggests that families have a stronger desire to control firms because of their desire to transfer the business to heirs, to be able to hire relatives, and to enhance the family name. All these private benefits are enjoyed by families as long as they maintain majority voting power. In addition, family control is also important to protect firm-specific human capital from hold-up action initiated by outsiders.

Following the prominence of takeover activities in the 1980's, the finance literature began to examine the linkage between the market for corporate control and capital structure (e.g., Harris and Raviv, 1988; Stultz, 1988). This stream of research argues that capital structure affects the outcome of takeover contests through its effect on the

distribution of votes. This research reveals the fact that while common stock carries votes and debt does not, debt is nonetheless used as a device that allows current owners to retain control of their firm. New equity reduces the percentage of the firm's equity capital controlled by the original owners, but debt financing avoids this dilution effect.

Harris and Raviv (1988) focus on the ability of incumbent managers to manipulate the methods and probability of success of a takeover attempt by changing the fraction of the equity they own. Since a manager's share ownership is determined indirectly by the firm's capital structure it affects the probability of takeover. In particular, incumbent managers increase their stake by repurchasing equity from passive investors and by financing the repurchase by issuing debt. Stultz (1988) argues that as the incumbent's share increases, the premium offered in a tender offer increases, but the probability of takeover is reduced. Both Harris and Raviv and Stultz conclude that the takeover targets increase their debt levels on average and that leverage is negatively related to the success of the tender offer.

Takeovers lead to a loss of any personal benefits derived from being in control. Also, takeovers might expropriate quasi-rents from firm-specific investments. Families try to insulate themselves from takeovers because of the relatively high value of private benefits of control they received from the family firms and their significant investment in firm-specific human capital. This strong desire to retain control dictates whether family firms to choose debt over new equity, which leads to the hypothesis that family controlled firms will experience higher levels of leverage than non-family controlled firms. Both Wiwattanakantang (1999) and Poutziouris *et al.* (2002) provide some support for this hypothesis. Wiwattanakantang (1999) found that family controlled firms in Thailand have significantly higher levels of debt than non-family controlled firms.

She attributes this finding to owners' desire to protect their voting power. In addition, a recent survey into the financial affairs of U.K. family companies (Poutziouris *et al.*, 2002) shows that the most important factor that deters family firms from raising external equity capital is the dilution/loss of ownership and management control.

Leverage and Risk Reduction - The corporate finance literature (Agrawal and Nagarajan, 1990; Muller, 2004) demonstrates that family shareholders tend to be more risk averse and are more concerned with the firm's total risk. The families' large economic stake in the firm is generally not well diversified due to financial constraints. In addition, families have significant firm-specific human capital invested in the firms they control. Since human capital cannot be traded in a competitive market, it cannot be effectively diversified (Amihud and Lev, 1981).

The incomplete contract approach pioneered by Grossman and Hart (1986) and Hart and Moore (1990) proposes a useful understanding of control issues related to the choice of capital structure. They argue that, in reality, it is impossible to write a comprehensive contract that anticipates and deals with all future eventualities. In this incomplete contact world, control matters as it affects what happens in events not covered by the contract.

Recent financial contracting literature (see Hart, 2001) takes the view that, although the contracting parties cannot specify what decisions should be made in unspecified future contingencies, they can choose a decision-making process in advance. One way they do this is through their choice of capital structure. Equity, for example, generally comes with votes. With these votes equity-holders have the right to choose the board of

directors, which in turn has the right to make key decisions in unspecified future contingencies. In contrast, debtholders do not have a right to choose the board of directors or to make decisions in the firm directly. However, they have other rights. If creditors are not repaid, they can force the firm into bankruptcy. Moreover, if the firm enters bankruptcy, then creditors often acquire some of the owners' powers (Hart, 2001).

Aghion and Bolton (1992) adopted this incomplete contract approach to explain control rights in capital structure choice. They show that shareholders or managers retain control of the firm in normal conditions while creditors take control in default states. In other words, debt is an instrument that facilitates a shift in control.

This perspective has a different focus compared with the previous literature. In Modigliani-Miller's world, the firm's cash flows are fixed and equity and debt are characterised by the nature of their claims on these cash flows: debt has a fixed claim while equity receives the residual. In Jensen and Meckling (1976), the same is true except that now the allocation of cash flow claims can affect firm value through managerial incentives. In neither case do votes or decision rights matter. In contrast, in the financial contracting literature, decision rights or votes are key (Hart, 2001).

Similarly, Kester and Luehrman (1995) argue that debt and equity are not only different types of financial claims, but are alternative approaches to governance. They argue that equity is more flexible and forgiving. That is, the firm's decision not to pay dividend does not lead to liquidation. On the other hand, debt constitutes a fairly rigid, rules-based approach to governance. Borrowers contract with lenders to make regular cash

payments of interest and principal as well as to meet strict covenants. The failure of firms to follow these rules can lead to the liquidation of the company's assets.

Extant studies on financially distressed firms are generally consistent with the argument of Aghion and Bolton (1992) and Kester and Luehrman (1995). That is, financial distress is frequently associated with a change in control. Gilson (1990) found that corporate default leads to a significant change in ownership of the firm's residual claims and in the allocation of control to manage corporate resources. In approximately three out of four firms in Gilson's sample, lenders receive significant blocks of voting stock under the firms' debt restructure. In addition, he demonstrates that the majority of CEOs are removed from their firms at the conclusion of the bankruptcy or debt restructuring. When families lose control of the firm, they are unable to enjoy private benefits of control. That is, they are unable to transfer the business to heirs or employ family members. The family's reputation and pride is adversely affected and thus financial distress is very costly for family firms.

The impact of financial distress on family wealth is also substantial. Loderer and Sheehan (1989) demonstrate that shareholders experience losses of more than ninety percent in the first five years preceding bankruptcy. In addition to these losses, shareholders suffer additional losses when bankruptcy is announced. For example, Altman (1969) found that an average capital loss during the announcement of bankruptcy was approximately 26 percent.

The impact of bankruptcy on family firm-specific human capital is similar to that of a takeover. That is, families are motivated to invest in firm-specific know-how and skills with an expectation to generate quasi-rents in the future. When bankruptcy occurs, the

firm's control shifts to outsiders which places in doubt the firm's existence. As a result, families are unable to receive appropriate returns from their investment in human capital.

In summary, financial distress is costly for family shareholders because it adversely affects their financial and human capital, and more importantly, financial distress leads to a shift in control. Families lose control of their firms in the event of bankruptcy and hence, they lose private benefits of control. From a risk reduction perspective, family controlled firms will use less debt to reduce bankruptcy risk. Mishra and McConaughy (1999) provide evidence that is consistent with this view. They reveal that founding family controlled firms in the U.S. use less debt than their non-family counterparts, while Agrawal and Nagarajan (1990) show firms that have no debt are more likely to be family controlled.

Leverage Decisions of Family Controlled Firms in Australia - The families' desire to retain control and reduce firm risk has opposing effects on leverage decisions. On the one hand, the desire to concentrate voting power motivates families to use more debt. On the other hand, the desire to reduce bankruptcy risk motivates families to use less debt. The actual leverage decision depends on which effect is more dominant. Thus the property rights literature provides the prediction for this proposition.

Based on La Porta *et al*'s. (1998, 1999) *law matters* hypothesis, Claessens and Fan (2002) argue that in economies where government does not effectively enforce investor protection, enforcement by individual owners will be of primary importance. Without relying on the government, controlling owners have an incentive to obtain control to negotiate and enforce corporate contracts with various stakeholders, including minority

shareholders, managers, labour, suppliers, debt-holders and government. In short, Claessens and Fan (2002) argue that in a weak property rights environment, the desire to control will be strong. Since debt can be used to protect voting power, family controlled firms in countries with weaker investor protection will employ higher levels of leverage. Empirical evidence in Thailand (Wiwattanakantang, 1999) supports this argument.

Australia has strong legal protection for shareholders and creditors (see La Porta *et al.*, 1998, 1999). Claessens and Fan's (2002) property rights argument implies that owners of family firms in Australia have a strong desire for effective control due to a robust property rights environment. Therefore, the desire to reduce firm risk might be more dominant, which leads to the hypothesis that family controlled firms in Australia will employ lower levels of leverage.

Lamba and Stapledon (2001) argue that La Porta *et al.*'s (1998, 1999) *law matters* hypothesis does not adequately explain corporate ownership structure in Australia. While studying the determinants of corporate ownership structure in Australia, the researchers found that although there is strong investor protection in Australia, large block holdings are fairly commonplace in publicly listed firms. They found that Bebchuk's (1999) *private benefit of control theory* has more explanatory power than La Porta *et al.*'s (1998, 1999) *law matters* hypothesis in explaining corporate ownership structure in Australia.

According to Bebchuk's hypothesis, the extent of ownership concentration depends on the size of the private benefit of control. When the private benefit of control is larger, control becomes more valuable and the founder is unlikely to relinquish authority after

the IPO. Therefore, in countries where private benefits of control are significant, larger block holdings will be relatively prevalent in publicly listed companies. Nenova (2003) found that the estimated value of private benefits of control in Australia is quite high (around 23 percent of firm value), similar to the value demonstrated in Brazil, Chile, France, and Italy.

Bebchuk (1999) suggests that comparatively large private benefits of control are likely to exist in companies whose controller founded the firm, or where families have controlled the firm for many years. Here there might also be some non-pecuniary benefits from controlling the firm. Examples of non-pecuniary benefits for family firms include the ability to hire relatives, the ability to transfer control to heirs, and the opportunity to enhance the family name (DeAngelo and DeAngelo, 1985; Mayer, 2001). Similarly, Denis and Denis (1994) maintain that family firms are more likely to place a sufficiently high value on the private benefits of control to compensate for the lack of diversification associated with large block ownership. Consistent with this argument, Heaney and Holmen (2004) found that control rights are more valuable to families than to other types of shareholders such as financial institutions, foundations, associations and governments.

Consistent with the private benefit of control theory, it is argued that although there is strong investor protection in Australia, the shareholder's desire to maintain control remains strong. Since private benefits of control in family firms is comparatively larger than that in non-family firms, families are more likely to have a stronger incentive to maintain control. As a result, family controlled firms in Australia will have higher levels of leverage. This leads to the following hypothesis:

H1: Family controlled firms will experience higher levels of leverage than non-family controlled firms.

3.4 The Impact of Family Control on Debt Maturity

Milgrom and Roberts (1990) argue that a series of short-term 'complete' contracts, renegotiated frequently, may approximate the role of long-term contracts. In such cases, a series of short-term contracts leads to efficiency over a period of time. However, they also argue that costs of negotiating short-term agreements represent a fundamental transactions cost.

There are several conditions that cause short-term contracts to underperform compared with longer term contracts (Milgrom and Roberts, 1990). Asymmetric information and opportunistic behaviour at the renegotiation of contracts prevent the parties from smoothly negotiating an efficient agreement. This logic can be applied to the model of debt maturity choice.

Flannery (1986) examines the signaling effect of the firm's debt maturity choice under asymmetric information. In this model, Flannery argues that asymmetric information induces a bias toward short-term debt. That is, firms with favorable private information about future profitability prefer to issue short-term debt since they expect to borrow under more favorable terms later.

Diamond (1991) improves on Flannery's model by incorporating liquidity risk into the debt maturity choice model. He finds a tradeoff in debt maturity choice, that is, although short-term debt is used by firms to avoid locking their financing costs in with long-term

debt, short-term debt maturity nonetheless has liquidity risk (i.e., the risk that borrowers are forced into inefficient liquidation because refinancing is not available).

Similar to other financial contracting literature which follows the incomplete contract paradigm (e.g., Aghion and Bolton, 1992; Bolton and Scharfstein, 1990; Hart and Moore, 1998), Diamond (1991) assumes that if the debt cannot be repaid in full, lenders have the right to liquidate or take control of the firm. In such cases, owners will lose their control rents (i.e., private benefits of control).

Sharpe (1991) also shows that when a firm is financed with short-term debt, the lender subsequently finds it unprofitable to rollover the loan and consequently, the lender forces the firm into liquidation. Even if this extreme outcome is not realised, short-term debt can also result in a loss of project rents if it has to be refinanced at an overly high interest rate (Titman, 1992; Froot *et al.*, 1993). Firms experience significant indirect costs of financial distress (e.g. loss of customers and distraction of management) when they lose access to attractively priced credit (Guedes and Opler, 1996). All these refinancing risks surrounding short-term debt motivate firms to lengthen the maturity of their debt.

Finnerty and Emery (2001) argue that the firm's attitude toward risk affects its philosophy about financing policy, including its choice of short-term versus long-term debt. Due to the liquidity risk of short-term debt, firms whose shareholders are not well diversified, as is often the case with family-controlled firms, frequently choose a relatively higher proportion of long–term debt financing. These arguments lead to the following hypothesis:

H2 : Family controlled firms will utilise longer term debt maturity more than non-family controlled firms.

3.5 The Impact of Family Control on Leasing Decision

Mukherjee (1991) conducted a survey on factors that managers consider when making leasing versus buying/borrowing decisions. He found that the risk of obsolescence is the dominant reason for leasing. Similarly, Sharpe and Nguyen (1995) demonstrate that leasing helps to reduce the cost of financial distress, particularly in companies that have fully utilised their debt-raising capacity.

Theoretical work by Smith and Wakeman (1985) show that closely-held shareholders reduce risk by leasing assets so that the lessor bears some of the risk associated with the use of the asset by the lessee. This view is shared by Flath (1980, p. 255): " .... shifting of risk can be a reason for leasing. Among lessees, this is most likely to be so for closely-held firms and least likely to be so for corporations with widely dispersed shareholders".

There are at least two ways lessees shift asset risk to the lessor. First, firms transfer fluctuations in the economic value of the asset to the lessor. The uncertainty in asset values results from many factors such as unpredictable technological obsolescence, competition of substitutes, and interest rate uncertainty. This risk associated with asset values can be transferred to the lessor, who is better able to manage the risk. By purchasing and leasing different items, the lessor benefits from diversification (i.e., loss in some items will be offset by other items that retain more value).

Second, leasing offers a hedge against business risk if lease payments are tied into the asset's use by way of a metering agreement. That is, when asset usage is high, lease payments are higher; when asset use is low, lease payments are lower.

Large shareholders other than family shareholders usually hold well-diversified portfolios. Therefore they are less likely to value the benefits of leasing in reducing obsolescence and other asset-specific risk. On the other hand, managers in widely-held firms tend to choose financing sources that reduce the firm's total risk, suggesting their preference for leasing. Families are even more risk averse than managers in widely-held corporations and thus, it is predicted that family controlled firms will value risk reduction benefits of leasing more than managers in widely-held firms. These arguments lead to the hypothesis:

H3 : Family controlled firms will have a higher proportion of leasing than non-family controlled firms.

3.6 The Impact of Family Control on Capital Structure Decisions

Several studies (e.g., Barclay *et al.*, 2003; Johnson, 2003) argue that capital structure decisions are jointly determined to control incentives and information problems. There are at least three theories that provide support for the joint determination of capital structure decisions and the predictions for these associations. These are the agency cost, information cost and financial distress cost hypotheses.

Agency cost hypothesis - There are two main types of agency costs of debt: asset substitution and underinvestment. The asset substitution problem occurs when riskier

assets are substituted for the firm's existing assets, thereby expropriating value from the firm's debtholders. Firms routinely make decisions that result in the substitution of assets. A common example is cash used to buy equipment or material. In fact, for every investment, some assets are substituted for others. With risky debt, stockholders are motivated to substitute riskier assets for the firm's existing assets. If an investment yields larger returns, well above the face value of debt, equityholders capture most of the gains. If however, the investment fails, because of limited liability of shareholders, debtholders bear the consequences (Emmery and Finnerty, 2001).

Myers (1977) argues that a firm employs two types of assets: tangible assets where returns are unaffected by further investments, and growth opportunities, where returns are substantially enhanced by subsequent discretionary investment. In certain circumstances (especially in states of financial distress), where shareholders control the investment decisions and bear the entire cost of the project, only a fraction of the increase in firm value is received. If this occurs the gain from investments in growth opportunities go primarily to bondholders, making these opportunities less attractive to firms that are reluctant to undertake projects, even though these project might yield a positive NPV (i.e., the firm tends to underinvest).

The asset substitution and underinvestment problem reduces firm value. The value lost as a result of these problems is referred to as the agency cost of debt. Jensen and Meckling (1976) argue that rational debtholders are aware of these conflicts and of the possible actions firms can take against bondholders. Thus, when debt is issued, lenders will charge a higher interest rate, or in the case of bond issues, the value of the bond is discounted immediately for the expected losses these anticipated actions will induce. An increase in interest rates (or discounting) means that, on average, stockholders do not

gain from these actions. Hence, incentives are created for firms to offer several ways to limit possible actions that benefits shareholders at the expense of debtholders (Masulis, 1988).

The conflict of interest between shareholders and managers can be controlled in a number of ways. Using lower debt, shorter-term debt maturity and leasing are postulated to be optimal financing decisions for reducing costs associated with underinvestment and or asset substitution problems.

Smith and Watts (1992) argue that one way to control agency problems between shareholders and debtholders and its associated value loss is to finance growth options with equity rather than debt (i.e., lowering leverage). Without any restrictions, companies whose value consists primarily of investment opportunities have more flexibility in their choice of future investments, and therefore, have a tendency to invest sub-optimally (i.e., either substitute projects which increase the firm's risk or underinvest) to expropriate wealth from bondholders. Therefore, this type of firm should borrow less.

In addition, debtholders face higher costs of monitoring stockholders in higher growth firms than they do in lower growth firms. As the assets of higher growth firms are largely intangible, debtholders have more difficulty observing how stockholders use assets in these firms. For example, debtholders and stockholders often experience conflict over the desirable amount of firm risk, with debtholders generally preferring less risk. It is easier for stockholders in higher growth firms with mostly intangible assets to increase firm risk and more costly for debtholders to detect increases in firm risk (Goyal *et al.*, 2002). In short, the costs of debt financing are higher in firms with

more growth opportunities. In such cases, a firm is expected to use lower debt levels in order to reduce the agency cost of debt.

Myers (1977) argues that firms mitigate the underinvestment problem by issuing short-term debt. According to this argument, using short-term debt that matures before a firm exercises its growth options allows stockholders to capture a larger proportion of the value created by positive net present value projects. Barnea *et al.* (1980) also argue that short-term debt assists in alleviating the asset substitution problem. This idea follows the option pricing model in which equity is viewed as an option on firm value. They argue that since shorter-term options are less sensitive to changes in project variances, short-term debt diminishes shareholders' incentive to engage in low-value high-variance projects.

Stultz and Johnson (1985) show that high-priority claims assist in mitigating the underinvestment problem. An underinvestment problem occurs when the existing unsecured debt holders are the major beneficiaries of new investments, thereby discouraging stockholders from supporting the undertaking. Because the issuance of secured debt allows the firm to acquire a new project and segregate the claim on the project's cash flow, it limits the extent to which debtholders can benefit from positive NPV projects. This, in turn, makes it more likely that shareholders will accept such projects, thereby mitigating the underinvestment problem (Masulis, 1988).

In addition, if debt is secured, the pledged assets cannot be disposed of without the permission of lenders and therefore, firms cannot easily reduce the value of bondholder's claim by substituting projects which increase the firm's risk (Smith and

Warner, 1979). Therefore, secured debt can be used to manage the asset substitution problem.

A lease contract can be viewed as a strong form of secured debt where the lender receives a legal claim to secured assets at the time of the loan (Masulis, 1988). The lessor continues to receive full compensation even after the lessee files for bankruptcy, while other creditor claims, including those of secured creditors, have no assurance of being met. Therefore, Sharpe and Nguyen (1995) and Barclay and Smith (1995b) argue that the financial contracting advantages of leasing to control the agency cost of debt (i.e., asset substitution and underinvestment) is even stronger than that for secured debt.

In summary, the agency cost hypothesis proposes that the conflict of interest between shareholders and debtholders (i.e., the underinvestment and asset substitution problem) can be reduced by employing less leverage, shorter-term debt and higher proportions of lease contracts. Table 3.1 summarises the relationship between the agency costs of debt and the choices between optimal capital structure decisions.

Table 3.1 Agency costs of debt and financial policy

Financial policy	**Agency costs of debt**	
	Low	**High**
Optimal leverage	High	Low
Optimal debt maturity	Longer	Shorter
Optimal lease share	Low	High

Barclay *et al.*, (2003) argue that capital structure decisions are substitutes for addressing incentive problems. They studied leverage and debt maturity jointly and found a

negative relationship between leverage and debt maturity, indicating that leverage and debt maturity are substitutes in controlling incentive problems. This suggests that the leverage-debt maturity relationship is negative, whereas the leverage-leasing and debt maturity-leasing relationships are positive. Lower levels of leverage and shorter-term debt are used to address the agency problem. If these two mechanisms are substitutes, the relationship between them is negative. That is, firms that already use *less* leverage to control the underinvestment and asset substitution problems will not use *short-term* debt to address a similar problem. On the other hand, the relationship between leverage and leasing should be positive if one element is being used instead of the other. That is, firms that already use *less* leverage to control the underinvestment and asset substitution problems will not use *higher* proportions of leasing to address similar problems. Similar logic can be applied in the case of debt maturity and leasing.

Relationships among capital structure decisions are not always interchangeable. For example, Johnson (2003) found a positive relation between leverage and debt maturity. That is, firms with higher leverage have longer debt maturity. This result seems to support the argument of strategic complementarities between debt maturity and leverage. If the relationship between leverage and debt maturity are complements, the leverage-debt maturity, leverage-leasing, and debt maturity-leasing relationships will have opposite signs to those if the capital structure decisions are substitutes. That is, the leverage-debt maturity relationship is positive, whereas the leverage-leasing and debt maturity-leasing relationships are negative. Table 3.2 presents a summary of the relationship among capital structure decisions and the agency cost of debt.

Table 3.2 Capital Structure Decisions and the Nature of its Relationship to the Agency Cost of Debt.

Relationship	Nature of relationship	
	Substitute	**Complement**
Leverage – debt maturity	-	+
Leverage – leasing	+	-
Debt maturity - leasing	+	-

Information asymmetry hypothesis - Smith and Watts (1992) argue that a substantial literature examines the impact of information asymmetries on financing policy, but most of it does not attempt to explain cross-sectional variation in capital structure. Following Ross (1977) and Myers and Majluf's (1984) arguments, Smith and Watts maintain that there is no incentive to signal when there is no information asymmetry. In other words, greater information disparity leads to greater demand for signaling. In addition, Smith and Watts assume that if the costs of signaling vary, they will be less sensitive to variation in the size of the information disparity than to the benefits of signaling. Based on these assumptions, the implication is that firms that face greater information disparities choose the least mispriced securities.

Barclay *et al.* (1995) argue that debt and equity claims differ because of sensitivity to changes in firm value. Since the promised payments to bondholders are fixed, stock prices are much more sensitive to changes in firm value than debt prices. When firms need to raise additional capital by selling additional debt or equity, they choose to sell the security that is least undervalued. In this case, firms issue debt because it is less sensitive to mispricing than equity. In general, Barclay *et al.* (1995) argue that

asymmetric information models imply that firms with higher asymmetric information tend to issue debt over equity since debt is less undervalued than equity.

Under the Myers and Majluf model, short-term debt is preferred to longer term debt because the price of short-term debt is less sensitive to that of longer term debt. The pricing of long-term debt is more sensitive to changes in firm value than the pricing of short-term debt. Although mispricing of the firm results in both long-term and short-term debt being mispriced, the mispricing of long-term debt is greater. Because the information cost of short-term debt is lower than that of long-term debt, the asymmetric information model suggests that short-term debt reduces costs related to the adverse selection problem (Barclay *et al.*, 1995).

Sharpe and Nguyen (1995) argue that through lease financing, the firm effectively puts its financial obligation on par with other administrative expenses such as employee and management compensation, which have a higher priority than normal debt. This aspect of lease contracting makes it highly desirable in the presence of high asymmetric information, and places leasing on top of the pecking order of external financing. In short, firms that face higher costs of external capital use leasing to reduce information costs.

In conclusion, the theory predicts that firms with higher asymmetric information use higher levels of debt, shorter-term debt maturity and higher proportions of leasing. Table 3.3 summarises the impact that information costs have on capital structure decisions.

Table 3.3 Information costs and financial policy

Financial policy	Information costs	
	Low	**High**
Optimal leverage	Low	High
Optimal debt maturity	Longer	Shorter
Optimal lease share	Low	High

Similar to the agency perspective, leverage, debt maturity, and leasing decisions are either substitutes or complements of reducing information asymmetry. The prediction for each argument is outlined in Table 3.4.

Table 3.4 Capital Structure Decisions and the Nature of its Relationship to the Information Cost Perspective

Relationship	Nature of relationship	
	Substitute	**Complement**
Leverage – debt maturity	+	-
Leverage – leasing	-	+
Debt maturity - leasing	+	-

Financial distress cost hypothesis - Aghion and Bolton (1992) adopt an incomplete contract approach to explain the control rights in capital structure choices. They show that shareholders or managers retain control of the firm under normal operating conditions, whereas creditors take control of the firm under default conditions. That is, debt is an instrument that facilitates a shift in control. Financial distress leads to a shift in control from shareholders to debt-holders. If this occurs, the shareholders lose all

benefits of control. In short, the costs of financial distress yield a clear economic rationale for firms to choose a conservative financing policy.

Peirson *et al.* (2002) argue that the probability of financial distress depends on the company's business risk and on its financial leverage. Business risk is related to the variability of future net cash flows, attributed to the nature of the company's operations. If a company is financed entirely by equity, variations in the returns to shareholders are attributable only to business risk. Once a firm uses debt finance, shareholders are also exposed to financial risk. This results in payments to debt-holders being fixed obligations. When firms are unable to meet these fixed contractual obligations, these defaults lead to financial distress. The financial risk faced by shareholders is directly related to the proportion of debt in the company's capital structure. Therefore, risk averse firms will choose lower leverage levels to reduce the probability of financial distress.

Diamond (1991) incorporates liquidity risk into the debt maturity choice model and finds a tradeoff in debt maturity choice. He argues that although short-term debt is used by firms to avoid locking their financing costs with long-term debt[6], short-term debt also has liquidity risk. That is, a firm's failure to obtain refinancing forces it to liquidate despite continuation being the optimal strategy. This sub-optimal liquidation represents the cost of short-term debt and can be viewed as part of the expected bankruptcy costs (Johnson, 2003). By choosing longer-term debt, firms can decrease the probability of being liquidated inefficiently.

[6] Short-term debt allows a reduction in borrowing costs when a firm receives good news and debt is refinanced.

Firms use leasing to reduce financial distress risk in several ways (Schallheim, 1994; Brigham and Gapensi, 1993). First, firms can transfer fluctuations in the economic value of the asset to the lessor. Uncertainty in asset values can result from many factors such as unpredictable technological obsolescence, competition of substitutes and interest rate uncertainty. For example, some technological obsolescence makes one particular asset almost worthless in the short-term, and this large economic depreciation could make the entire project unprofitable. The risk associated with asset values can be transferred to the lessor, who is better able to manage the risk. By purchasing and then leasing many different items, the lessor benefits from diversification (i.e., loss in some items will be offset by other items that retain more value). In addition, lessors are generally familiar with market conditions for the asset and therefore are able to obtain a better price in the resale market. Second, leasing offers a hedge against business risk due to its payment schedule flexibility. For example, if lease payments are tied into the assets use by way of a metering agreement, it offers a hedge against business risk. That is, when asset usage is high, lease payments are higher; when asset use is low, lease payments are lower.

In summary, the financial distress cost hypothesis argues that less debt, longer-term debt maturity, and a higher proportion of lease arrangements are employed interchangeably to reduce bankruptcy risk. Table 3.5 shows whether the probability of financial distress is high or low in relation to the optimal capital structure decision, whereas Table 3.6 presents the interactions and predictions among capital structure variables when testing the financial distress costs hypothesis.

Table 3.5 Financial distress costs and financial policy

Financial policy	Probability of financial distress	
	Low	High
Optimal leverage	High	Low
Optimal debt maturity	Shorter	Longer
Optimal lease share	Low	High

Table 3.6 Capital Structure Decisions and the Nature of its Relationship to Financial Distress Cost

Relationship	Nature of relationship	
	Substitute	Complement
Leverage – debt maturity	+	-
Leverage – leasing	+	-
Debt maturity - leasing	-	+

Family Control and Capital Structure Decisions - Agency, information and financial distress costs provide different predictions to the relationships among capital structure decision variables (i.e., leverage, debt maturity and leasing). One of the primary research questions is which hypothesis better explains the simultaneous capital structure decisions of family firms.

Gugler (2003) argues that large asymmetries of information between management and owners are not present in family-controlled firms. This depends upon whether managers and large family shareholders are often the same person. Therefore, the needs of family firms to reduce information asymmetry are not significant. In addition, the agency

literature (e.g., Fama and Jensen, 1983) argues that conflicts of interest between managers and shareholders are lower in family firms. In other words, family firms are more likely to reduce agency cost of equity rather than the agency cost of debt. Taken together, these arguments suggest that the relationship among capital structure variables in family firms is unlikely to be consistent with the agency or information cost explanations.

However, the relationship among leverage, debt maturity and leasing decisions in family controlled firms is likely to be consistent with predictions provided by the financial distress costs hypothesis. The reasoning for this intuition is that family firms are more risk averse to financial distress than their non-family counterparts. Financial distress is costly for family shareholders as it adversely affects their financial and human capital and more importantly, it leads to a shift in control. That is, families lose control and their private benefits of control. Therefore, it is predicted that family controlled firms will use capital structure decisions jointly to reduce bankruptcy risk. The above arguments lead to the following hypothesis:

H4: The relationship among capital structure decisions for family controlled firms will follow the financial distress cost argument.

3.7 Chapter Summary

This chapter identifies two unique characteristics of family firms that distinguish their capital structure decisions from those of non-family firms: families have a stronger desire to control and to reduce bankruptcy risk. These unique characteristics lead to different leverage, debt maturity, and leasing decisions. In particular, it is predicted that

family controlled firms in Australia will use higher level of leverage, longer term debt maturity and higher proportions of leasing. In addition, interactions among capital structure variables for family firms are hypothesised to be consistent with the financial distress explanation.

CHAPTER 4
Research Design, Methodology and Procedures

4.1 Introduction

This chapter describes issues related to research design, data, sample, empirical models, and procedures used in the study. The main objective is to choose the research design that maximises internal validity. By ensuring sufficient controls in the research design, the likelihood of drawing valid conclusions from the study is enhanced.

Section 4.2 describes an outline of research design used in this study while Section 4.3 identifies internal validity threats as well as procedures to address some of these issues. The sample and data (including data validation procedures) are discussed in section 4.4. Subsequent sections (Section 4.5 to 4.8) illustrate the empirical models and measures to test the hypotheses. Section 4.9 describes data screening and transformations used in this study and finally, Section 4.10 explains the techniques used to estimate empirical models.

4.2 Research Design

In disciplines such as psychology and medicine, causal effects are commonly estimated using experiments. An experiment is a scientific investigation in which an investigator manipulates one or more independent variables while holding all other variables constant, and the dependent variable is observed for concomitant variation to the

manipulation of the independent variables. In short, the essence of an experiment is control within the research project (Kerlinger, 1986).

Control is relatively easily achieved in the natural sciences. However, research in the finance discipline is fundamentally non-experimental in design. In non-experimental research, direct manipulation of independent variables by the researcher is generally not possible (Ryan *et al.*, 1992). That is, the levels of control potentially achieved in non-experimental design are generally lower than that in experimental design. As a result, experimental design is generally more powerful than non-experimental design.

The level of control is a key determinant of internal validity. A study has high internal validity if it provides confidence that changes in the dependent variable are a result of changes in the independent variable and not by confounding factors. Internal validity determines whether valid conclusions can be drawn from a study. Thus, in designing the research project, the objective is to maximise the internal validity of the study. By ensuring that sufficient controls are in place in the research design, the likelihood of drawing valid conclusions from the study is enhanced.

Observational data, including financial data, are not derived from experiments and therefore pose major challenges when estimating causal effects. In the real world, levels of treatment are not randomly assigned, thus it is difficult to differentiate "treatment effects" from other relevant factors (Stock and Watson, 2003). Accordingly, a discussion of internal validity as well as how this research addresses some of these issues, particularly from an empirical modeling perspective, follows.

4.3 Internal Validity

Multiple regression permits estimation of the effect of one particular independent variable on the dependent variable, while holding other regressors constant. However, multiple regression also suffers from its own internal validity threats. Stock and Watson (2003, pp. 245-254) discuss several validity threats for multiple regression. They argue that studies based on regression analyses are internally valid only if the estimated regression coefficients are unbiased and consistent, and if their standard errors yield confidence intervals within the desired specified range.

It is assumed in regression analysis that all explanatory variables are uncorrelated with the error term. If an explanatory variable and the error term are correlated, the OLS mistakenly attributes variation in the dependent (y) variable caused by the error term (ε). If, for example, the error term (ε) and x are positively correlated, the estimated coefficient will be probably higher. Stock and Watson argue that there are at least five reasons why the OLS estimator might be biased: omitted variables; misspecification of functional form; measurement error of the independent variable; sample selection; and simultaneous causality. All five sources of bias arise because the regressor is correlated with the error term in the population regression.

Omitted variable bias - In multiple regression, the coefficient β_k represents a change in the dependent variable y caused by one-unit change in the independent variable x_k, holding constant all other independent variables in the equation. If one or more variables are omitted, the variables in the equations are not held constant for the calculation and interpretation of β_k. In other words, the expected value of the estimated coefficient deviates away from the true value of the population coefficient.

Capital structure theory explains that four factors either decrease or increase firm value: the firm's tax position, agency costs, financial distress costs, and information costs. The theory also suggests that several firm characteristics such as growth opportunity, firm size, profitability, firm age, business risk and asset tangibility affect these factors. Independent variables are selected on the basis of previous capital structure studies and all important variables have been considered to avoid omitted variable bias. Sections 4.5 to 4.8 discuss in more detail the variable selection processes.

This study also uses financial data of publicly listed firms in Australia from 1998-2002. Panel data are used to control unobserved variables and to increase the internal validity of the study. In addition, panel data provides more informative data, more variability, less collinearity among variables, more degrees of freedom and greater efficiency (Baltagi, 2002). Panel data methodology is discussed in more detail in Section 4.10.

Misspecification of functional form - If the true population regression function is non linear but the estimated regression is linear, this functional form misspecification creates bias in the OLS estimator. This is similar to omitted variable bias, in which omitted variables are terms that reflect the missing nonlinear aspect of the regression function.

Diamond (1991) predicts that low credit quality and high credit quality firms tend to borrow short-term, whereas intermediate quality firms borrow long-term. Diamond's proposition leads to a non-linear relationship between debt maturity and firm quality. Johnson (2003) uses both firm size and the square of firm size in the debt maturity equation to avoid problems of misspecification of functional form. Indeed, this study avoids misspecification of functional form by following Johnson's (2003) procedures.

Measurement error – Measurement error in variables occurs because of limitations in the availability of data. Operating lease assets, for instance, are not available directly from the balance sheet and therefore must be estimated. The estimation process is not perfect and might lead to measurement error.

Sometimes measurement error in both the dependent and independent variables exists because of conflicting theories. For example, several researchers (e.g. Smith and Watts, 1992) argue that total debt in the calculation of the leverage ratio should be measured using interest bearing debt, whereas other researchers propose the use liabilities (e.g. Huang and Song, 2002).

Variable selection strongly influences estimation results. If different measures reflect different distributions, estimated coefficients will depend on the model chosen. Borsch-Supan and Koke (2002) propose that researchers choose one measure and use alternative measures for sensitivity analyses. This study adopts Borsch-Supan and Koke's suggestion and wherever possible, several measures of the dependent variable and independent variables are used to ensure the robustness of results.

Another procedure used to reduce measurement error was data validation. Financial data were collected mainly from *FinAnalysis*, a database which contains pertinent annual report information. To reduce human input error, the data from *FinAnalysis* were validated by conducting cross checks with *Company Analysis*, another database which contains annual report information. The data validation procedure is explained in Section 4.4.

In addition, the between estimator for panel data was used to address some of the measurement error problems. The between estimator averages the variable observations and thus reduces bias by averaging out measurement error. Averaging also alleviates bias caused by correlations between the error term and the explanatory variables (Kennedy, 2003).

Sample selection - Sample selection bias occurs when availability of data are influenced by a selection process that is related to the value of the dependent variable. This selection process introduces correlations among the error terms and regressors, which leads to bias in the OLS estimator. A familiar example of sample selectivity bias are empirical studies on corporate governance. Most corporate governance studies focus on the largest listed companies. These companies are likely to be the most profitable firms in the market and performance is typically the focus. Hence, these samples suffer from an endogeneity problem (Borsch-Supan and Koke, 2002).

In order to obviate sample selection problem, this study includes all firms listed on the Australian Stock Exchange (ASX). It focuses on both the largest and smallest firms and therefore sample selection bias is minimised. The study also includes delisted firms to control for survivorship bias. In particular, for each research question, models are estimated using two groups: the full sample that *includes* delisted firms and a subset of firms that *excludes* delisted firms, and results from both groups are compared. The comparison provides an indication of survivorship bias.

Reverse causality – Reverse causality leads to simultaneous bias. For example, in analysing the relationship among capital structure variables, one variable is used as the dependent variable in one model and an independent variable in other models. That is,

there are feedback relationships among capital structure decisions (i.e., leverage, debt maturity and leasing). Since these endogenous variables are jointly determined, changes in the disturbance term affect the endogenous variables. As a result, all endogenous variables used as regressors are contemporaneously correlated with the disturbance term and hence a three stage least square estimator is used to address the two-way causal relationship. The nature of this method is examined in Section 4.10.

Stock and Watson (2003) argue that inconsistent standard errors pose a different threat to internal validity. Even if the OLS estimator is consistent and the sample large, inconsistent standard errors produce hypothesis tests with sizes that differ from the desired significance level. There are two reasons for inconsistent standard errors: heteroskedasticity and autocorrelation of the error term across observations. Heteroskedasticity occurs when different observations for the error term have different variances while autocorrelation represents correlations among the error terms. Both heteroskedasticity and autocorrelation violate the regression assumptions of equal variances and no correlation among the error terms.

Econometricians (e.g., Huber, 1967; White, 1980) have developed the Huber-White robust standard errors adjustment that is asymptotically valid in the presence of heteroskedasticity. Panel data usually not only encounter heteroskedasticity, but also serial correlation across time periods. Therefore, it is important to use standard errors that are fully robust to arbitrary heteroskedasticity and serial correlation. The Huber-White Sandwich variance estimator (clustered) is explained in Section 4.10.

Another threat to internal validity in multiple regression is the presence of outliers. Outliers represent observations that have a strong influence on the estimates produced

by the OLS. In the presence of outliers, the line of best fit moves towards the influential observation and therefore the OLS performs poorly in estimating the coefficients. Kennedy (2003) proposes a method of detecting influential observation by comparing OLS coefficient (and standard error) estimates using data with and without outliers.

4.4 Sample and Data

This study compares the capital structure decisions of family and non-family controlled firms listed on the Australian Stock Exchange (ASX). It uses the definition of family business proposed by Mroczkowski and Tanewski (2005), which is "an entity controlled by a private individual in conjunction with close family members" (p. 15), while control is defined as "the capacity to dominate decision-making" (p. 16).

Mroczkowski and Tanewski's analysis began with a cross-sectional qualitative examination of the population of companies registered with the Australian Stock Exchange (ASX) for the period ending 30 June 1998. The listed companies were categorised into active and delisted. For active companies (N=1,214), the data and specific criteria to differentiate family from non-family controlled firms (described in Table 4.1) were collected and examined.

Table 4.1 Data and Specific Criteria for Differentiating Family and Non-Family Control

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's share ownership (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)
Management Team	Determine the number and names of key management personnel (quantitative and qualitative measures)
Substantial Shareholdings	Determine the names and shareholdings of substantial shareholders (ASIC)
Related Parties	Determine the names of related parties and links between substantial shareholders (Notes to the Accounts)
Control Continuity	Examine the annual financial statements of each company for a period of two years after the initial year ending 30 June 1998

* ASIC Form 316 = Australian companies are required to disclose annually to the Australian Securities and Investment Commission their ownership interests

Source: Mroczkowski and Tanewski (2005)

Initially, the data were downloaded from ASX data disc. Where company information was not available from the ASX data disc, a complementary database such as Bloomberg's was used to complement the initial data source. In addition, Australian Securities and Investments Commission (ASIC) annual financial statement files were also used to validate initial data sources, to examine related party disclosures, to assess continuity of control for a period of two years after the initial year ending 30 June 1998. Since many public companies are owned by private companies or trusts via trustee companies, it was access to the ASIC databases that allowed Mroczkowski and

Tanewski to establish links between family members, directors, and their related entities.

In the final step, the data illustrated in Table 4.1 were examined and used to differentiate family from non-family controlled firms. In particular, Mroczkowski and Tanewski identify firms as family controlled if the founding family member has a key board position such as chairman and CEO and if the member owns more than 20 percent of the voting shares. In addition, firms are classified into the family category if the original shareholders and related parties hold more than 30 percent of the voting shares, and at least one of the related party members is on the board of directors.

As Mroczkowski and Tanewski's list of family and non-family firms was valid only for the period ending 30 June 1998, it was necessary to further validate the control status of company's for the entire period of analysis (i.e., 1998 to 2002). The main criteria used to differentiate family and non-family controlled firms were both family share ownership and family involvement in management. Therefore the 1998 list was validated by referring to data on director's interests and substantial shareholders. The company's annual reports were used to obtain these data, followed by cross checks with the Business Review Weekly (BRW) Rich 200 list. This list is published annually by Australia's premier weekly business magazine and provides rich background and insights into the top 200 wealthiest individuals or families who control Australia's public companies.

The sampling frame comprised the population (N=1,214) of companies listed on the Australian Stock Exchange (ASX) in 1998. Of the total number of companies, 218 were financial firms. These firms were excluded from the sample as they are subject to

government regulations, which restrict their discretion in capital structure decisions (Titman and Wessels, 1988). The sample was then further reduced to companies which had annual reports available over the five-year period (1998-2002).

Delisted firms were included in the sample to avoid survivorship bias. These were restricted to firms which had data available one year before delisting. The final sample of 856 companies comprised 697 active companies and 159 delisted companies. Family firms constitute around 18 percent (154) of the total sample. Table 4.2 presents the distribution of firms in the final sample.

Table 4.2 Sample Distribution

Description	Family Firms	Non-family Firms	Total
Sampling frame	207	1007	1214
Excluded			
Financial companies	35	183	218
Observation with incomplete data	18	122	140
Total excluded	53	305	358
Final sample	154	702	856
Delisted companies	24	127	151
Active companies	130	575	705

Most financial data were collected from *FinAnalysis*, a database which contains pertinent annual report information. As short-term debt, long-term debt, and equity are key variables, all data collected were validated by conducting cross checks with *Company Analysis*, another database which contains annual report information. If any differences were found, the company's actual annual reports (downloaded from *DatAnalysis*) were used to validate the correct figure. Financial and operating lease data were not available from either *FinAnalysis* or *Company Analysis*, and therefore were

collected manually from annual reports. Table 4.3 describes all variables used in this study with their corresponding data sources.

Table 4.3 List of Data Sources

Variable	Data sought	Source
Leverage	Short-term debt, long-term debt, current liabilities, non-current liabilities, market value of equity, total assets	FinAnalysis
Debt maturity	Short-term debt, long-term debt, current liabilities, non-current liabilities, market value of equity, total assets	FinAnalysis
Leasing	Leased assets, operating lease, interest expense, short-term debt, long-term debt, market value of equity, total assets	FinAnalysis Annual reports
Family control	Dummy variable (1 if family firm, 0 otherwise)	Mroczkowski and Tanewski (2005)
Effective tax rate	Tax expense, pretax income, total assets	FinAnalysis
Term structure of interest	Yield on 10-year government bond, treasury notes yield	Australian Bureau of Statistics
Profitability	EBIT, EAT, total assets, operating revenue, book value of equity	FinAnalysis
Business risk	EBIT, pretax profit, total assets, operating revenue, retained profits, current asset, current liabilities	FinAnalysis
Growth opportunity	Market value of equity, book value of equity, total assets, capital expenditure	FinAnalysis
Firm size	Total assets, operating revenue, market value of equity, short-term debt, long-term debt	FinAnalysis
Firm age	Year of firm incorporation	DatAnalysis
Asset tangibility	Net PPE, total assets	FinAnalysis
Liquidity	Current assets, current liabilities, cash, debtor, total assets	FinAnalysis
Asset maturity	Current asset, operating revenue, net PPE, depreciation	FinAnalysis
Industry variables	ASX industry classification	DatAnalysis

4.5 Empirical Model and Measures for Leverage

Empirical Model – Chapter 3 explained that family controlled firms in Australia will have higher level of debts than non-family controlled firms because of the family firms' desire to maintain control and to accrue private benefits. Thus the following pooled regression model outlined below tests the following hypothesis:

H1: Family controlled firms will experience higher levels of leverage than non-family controlled firms.

$$Leverage_{it} = \beta_0 + \beta_1\ Family\ Control_i + \beta_2\ Effective\ Tax\ Rate_{it} + \beta_3\ Profitability_{it} + \beta_4\ Firm\ Size_{it} + \beta_5\ Growth\ Opportunity_{it} + \beta_6\ Business\ Risk_{it} + \beta_7\ Asset\ Tangibility_{it} + \beta_8\ Firm\ Age_{it} + \beta_9\ Industry\ dummies_{it} + \beta_{10}\ Year\ dummies + \varepsilon_{it} \quad (1)$$

The subscripts i and t represent firm and year respectively. The model is similar to that employed by Anderson and Reeb (2003b). The measurement of the variables in Equation (1) is presented in Table 4.4.

Table 4.4 Variable Measurement: Leverage Regression

Variable	Measure	Note
Leverage	Total interest bearing debt / total capital[7]	Primary measure in Equation (1)
	Total interest bearing debt / total assets	Used in checks on robustness
	Total liabilities / total capital	Used in checks on robustness
	Total liabilities / total assets	Used in checks on robustness
Family control	Dummy variable (1 if family firm, 0 otherwise)	Primary measure in Equation (1)
Effective tax rate	Total tax / total taxable income	Primary measure in Equation (1)
	Total tax / total assets	Used in checks on robustness
Profitability	EBIT / total assets	Primary measure in Equation (1)
	EBIT / total operating revenue	Used in checks on robustness
	EAT / equity	Used in checks on robustness
Business Risk	Standard deviation of the past five years EBIT	Primary measure in Equation (1)
	Modified Z score (3.3 x pretax profit / assets + operating revenue/ assets + 1.4 x retained profits / assets + 1.2 x (current asset – current liabilities) / assets)*	Used in checks on robustness
Growth opportunity	Market to book value ratio	Primary measure in Equation (1)
	Capital expenditure / total assets	Used in checks on robustness
Firm size	Log (total assets)	Primary measure in Equation (1)
	Log (total operating revenue)	Used in checks on robustness
	Log (market capitalisation)	Used in checks on robustness
Firm age	Number of year since firm incorporation	Primary measure in Equation (1)
Asset tangibility	Net PPE / total assets	Primary measure in Equation (1)
Industry variables	Dummy variables (1 if mining companies, 0 otherwise – based on ASX industry classification)	Primary measure in Equation (1)
	Dummy variables (based on two digit ASX industry classification)	Used in checks on robustness

* This formula has been taken from Frank and Goyal (2003, p.35). Please note that 3.3, 1.4, 1 and 1.2 are constant terms.

[7] Total capital is calculated as a sum of total book value of debt plus market value of equity.

Measures - Two types of leverage are used in this study: book value and market value. Book value leverage is defined as the book value of total interest bearing debt divided by the book value of total assets. Market value leverage is defined as the book value of total interest bearing debt divided by total capital (i.e., the market value of equity plus the book value of total interest bearing debt). Huang and Song (2002) argue that liabilities are a steady part of company assets and are used extensively as a means of financing, and thus can be used to measure leverage. As a check on robustness of the leverage analysis, liabilities (instead of interest bearing debt) are used to measure both book value and market value leverage. Several measures of leverage are used to increase the internal validity of the study.

Family control is measured using binary values, that is, one if the firm is family controlled and zero otherwise. Hypothesis 1 is accepted if the coefficient on family control is positive and statistically significant. In other words, a positive coefficient on family control indicates that family controlled firms in Australia employ higher levels of debt than their non-family counterparts.

In addition to family control, the model includes standard control variables that are expected to affect leverage decisions such as the firm's effective tax rate, non debt tax shield, profitability, business risk, firm size, growth opportunity, asset tangibility, firm age, industry dummies and year dummies. It is expected that leverage will be negatively related to profitability, growth opportunity, business risk, and firm age, whereas it is predicted that leverage will be positively related to firm size and effective tax rate.

Twite (2001) provides evidence for a cross sectional relationship between effective tax rate and leverage under the Australian dividend imputation tax system. He shows that

the *effective* capital gains tax rate is less than that of both dividend and interest payments because only realised capital gains and losses are taxed. As a result, investors prefer unfranked dividends to be retained producing a capital gain for the investors. Assuming firms adopt optimal dividend policies, Twite argues that the value of $1 of equity income distributed via franked dividends and capital gains has a higher value than $1 of debt income.

The effective tax rate determines the level of unfranked dividends. That is, lower effective tax rates lead to higher proportions of income made available as unfranked dividends. Given that levels of unfranked dividends determine whether there is a preference for equity financing, firms with lower (higher) effective tax rates will have higher proportions of equity (debt), suggesting that a positive association exists between the effective tax rate and leverage. The effective tax rate is measured as tax expense divided by pretax income. Total asset is used as a deflator in checks for robustness.

The tradeoff theory predicts a positive association between profitability and leverage. As profitability rises, the firm has more taxable income to shield, and the expected financial distress cost declines. Therefore, higher profitability encourages higher leverage targets. In contrast, the pecking order theory maintains that profitability is negatively related to leverage. Profitable firms borrow less because these firms have more internal funds available, whereas less profitable firms require external financing and consequently accumulate debt. Extant research (see Myers, 2001) supports the prediction of the pecking order theory, that is, profitability is negatively associated with leverage. This study uses return on assets (i.e., EBIT divided by total assets) as a proxy for profitability. An alternate measure of profitability includes return on sales (i.e.,

EBIT divided by operating revenue) and return on equity (i.e., EAT divided by total equity).

The degree to which the agency problem affects leverage decisions depends on company characteristics such as growth opportunities. Myers (1977) argues that firm value consists of future investment opportunities and the assets that are in place. Myers proposes that companies whose value consists primarily of investment opportunities are likely to find that debt financing is very costly. Without any restrictions, such companies have more flexibility in their choice of future investments and therefore have a tendency to invest sub-optimally to expropriate wealth from bondholders. This argument suggests that growth opportunity will negatively affect leverage, and the market to book value ratio is used as a proxy for growth opportunity. For sensitivity analyses purposes, the ratio of capital expenditure to total assets is used to measure growth opportunity.

There are conflicting theoretical predictions on the effects of size on leverage (Rajan and Zingales, 1995). Larger firms tend to have lower levels of information asymmetry because capital market participants are more likely to have more information about larger firms, suggesting a negative association between firm size and leverage. However, larger firms tend to be more diversified and are less likely to face financial distress problems, indicating that firm size should positively affect leverage. Most capital structure studies have found evidence that is consistent with this financial distress explanation (see Harris and Raviv, 1991). The primary measure of firm size is the log of total assets, while a secondary measure includes the log of total market capitalisation and the log of total operating revenue.

Firm size is also used to proxy the agency problem. Pettit and Singer (1985) argue that smaller firms tend to have higher proportions of growth opportunities and are therefore more likely to face potential conflict of interest such as risk shifting and claim dilution between shareholders and bondholders. This agency perspective predicts a positive association between leverage and firm size.

Business risk exacerbates the probability of financial distress. Firms with uncertain operating income have a higher probability of experiencing financial distress, which suggests that the association between business risk and leverage should be negative. Bodie and Taggart (1978) similarly argue that firms with higher business risk are expected to have higher agency costs of debt. That is, firms with higher business risk are more likely to face financial distress, an event that exacerbates the underinvestment and asset substitution problem. This study uses the standard deviation of the annual percentage change in EBIT in the previous 5 years as a proxy for business risk. An alternate measure is the modified Altman's score (see Table 4.4 for calculation).

If a large fraction of a firm's assets are tangible, then assets should serve as collateral. In addition, assets should retain more value in liquidation. If most of a company's assets are tangible, there is less probability that wealth can be transferred from debtholders to shareholders through shifting to higher risk investments (i.e., the asset substitution problem). Therefore, when a firm has a greater proportion of tangible assets (measured as net property, plant and equipment to total assets) leverage should be higher (Rajan and Zingales, 1995).

Older firms produce more information about themselves and thus have lower levels of information asymmetry (Sharpe and Nguyen, 1995). Lower degrees of information

asymmetry increase the firm's preference for equity relative to debt and therefore the association between leverage and firm age should be negative. Firm age is proxied by using the number of years since firm incorporation.

To account for variation in leverage due to industry differences, an industry dummy variable is used and they take on the value of one if the firm is in the mining sector and zero otherwise. Alternative specifications of industry dummy variables using two digit ASX codes are also used as a check on robustness. Year dummies are included in the model to remove secular effects among the independent variables.

Table 4.5 presents a summary of predicted relationships between control variables and leverage. It should be noted that the predictions for agency theory are similar to those of the financial distress argument. This is not surprising as several capital structure researchers argue that the agency costs of debt are part of indirect financial distress cost (e.g., Myers, 2001).

Table 4.5 Summary of Relationships between the Firms' Characteristics and Leverage

Variable	References	Tax	Financial Distress	Agency Problem	Asymmetric Information
Effective tax rate	Twite (2001)	+			
Profitability	Myers (2001)	+			-
Growth opportunity	Myers (1977) Titman and Wessel (1988)			-	
Business risk	Grinblat and Titman (1998) Bodie and Taggart (1978)		-	-	
Firm size	Pettit and Singer (1985) Smith and Warner (1979) Rajan and Zingales (1995)		+	+	-
Asset tangibility	Rajan and Zingales (1995)		+	+	
Firm age	Sharpe and Nguyen (1995)				+

4.6 Empirical Model and Measures for Debt Maturity

Empirical Model - Hypothesis 2 proposed in section 3.4 states that *family controlled firms will utilise longer term debt maturity than non-family controlled firms.* The regression equation to test this hypothesis takes the following form:

$$Debt\ Maturity_{it} = \beta_0 + \beta_1\ Family\ Control_i + \beta_2\ Term\ Structure\ of\ Interest_{it} + \beta_3\ Growth\ Opportunity_{it} + \beta_4\ Firm\ Size_{it} + \beta_5\ Asset\ Maturity_{it} + \beta_6\ Firm\ Age_{it} + \beta_7\ Business\ Risk_{it} + \beta_8\ Industry\ Dummy_{it} + \beta_9\ Year\ Dummies + \varepsilon_{it} \quad (2)$$

The measurement of the variables in Equation (2) is reported in Table 4.6.

Table 4.6 Variable Measurement: Debt Maturity Regression

Variable	Measure	Note
Debt maturity	Long-term debt / total debt	Primary measure in Equation (2)
	Long-term liabilities / total liabilities	Used in checks on robustness
	Long-term debt / total capital	Used in checks on robustness
	Long-term debt / total asset	Used in checks on robustness
Family control	Dummy variable (1 if family firm, 0 otherwise)	Primary measure in Equation (2)
Term structure of interest	Yield on 10-year government bond – treasury notes yield	Primary measure in Equation (2)
Business Risk	Standard deviation of the past five years EBIT	Primary measure in Equation (2)
	Modified Z score (3.3 x pretax profit / assets + operating revenue / assets + 1.4 x retained profits / assets + 1.2 x (current asset – current liabilities) / assets) *	Used in checks on robustness
Growth opportunity	Market to book value ratio	Primary measure in Equation (2)
	Capital expenditure / total assets	Used in checks on robustness
Firm size	Log (total assets)	Primary measure in Equation (2)
	Log (total operating revenue)	Used in checks on robustness
	Log (market capitalisation)	Used in checks on robustness
Firm age	Number of year since firm incorporation	Primary measure in Equation (2)
Asset maturity	(Current asset/operating revenue) x (Current asset / (Current asset + net PPE)) + (Net PPE/depreciation) x (Net PPE/(Current asset + net PPE))	Primary measure in Equation (2)
Industry variables	Dummy variables (1 if mining companies, 0 otherwise – based on ASX industry classification)	Primary measure in Equation (2)
	Dummy variables (based on two digit ASX industry classification)	Used in checks on robustness

* This formula has been taken from Frank and Goyal (2003, p.35). Please note that 3.3, 1.4, 1 and 1.2 are constant terms.

Measures - The main proxy for debt maturity is the proportion of long-term debt to total capital (Titman and Wessel, 1988). Three additional measures of debt maturity are used for tests on robustness. First, total assets (instead of total capital) is used as a deflator for long-term debt. Second, the ratio of long-term debt to total debt, a measure used by Barclay and Smith (1995a)[8] and Scherr and Hulburt (2001). Third, debt maturity is measured using the proportion of long-term liabilities to total liabilities. Liabilities are routinely used by firms to finance investment in production and therefore, they can be viewed as a source of finance (Stohs and Mauer, 1996). Stohs and Mauer also developed a debt maturity structure measure by computing the book value weighted-average debt maturity, debt-like obligations outstanding and current liabilities. In order to calculate this measure, detailed information regarding the type and maturity of each debt instrument outstanding in a firm's fiscal year-end is required. However, given limited disclosure requirements of liabilities in Australian financial statements, Stohs and Mauer's (1996) weighted-average debt maturity method was not possible to compute. Various measures of debt maturity above are used to enhance the internal validity of the study.

Family control was measured using binary values, that is, one if the firm is family controlled and zero otherwise. An expected positive coefficient sign on family control indicates that family controlled firms in Australia have longer debt maturity than their non-family counterparts.

Similar to the variables used in the leverage equation, the debt maturity equation controls for growth opportunity, business risk, firm size and firm age. Two additional

[8] Barclay and Smith (1995a) use a three-year maturity model to divide long-term debt into short-term debt. This criterion cannot be used in the Australian context because of limited disclosure requirements governing debt-maturity.

variables specific to debt maturity are also controlled for, namely asset maturity and the term structure of interest rates. Following Stohs and Mauer (1996), asset maturity is proxied as the sum of current asset maturity (calculated as (Current asset/total revenue) x (Current asset/(Current asset + net PPE)) and long-term asset maturity (calculated as (Net PPE/depreciation) x (Net PPE/(Current asset + net PPE)). The term structure of interest rates is calculated as the yield on 10-year government bonds minus the treasury notes yield. Similar to the leverage equation, industry and year dummies are included in the equation to control for variation in debt maturity due to seasonal and industry differences.

Brick and Ravid (1985) analyse the tax implications of debt maturity decisions. They argue that if the yield curve is upward sloping, the interest expense from issuing long-term debt is greater than the expected interest expense from rolling short-term debt. Therefore, Brick and Ravid argue that issuing long-term debt reduces the firm's expected liabilities and consequently increases the firm's market value.

Peirson *et al.* (2002) argue that any tax advantage gained from the choice of debt maturity must be insignificant under the Australian imputation tax system. Since company tax is only a withholding tax from the viewpoint of resident shareholders under the Australian imputation tax system, any tax advantage gained by deferring the company's tax payments (as in the case of debt maturity choice) will have no impact on firm value. Therefore, the term structure of interest rates should have no impact on debt maturity decisions.

A common prescription in the literature is that firms should match the maturity of their liabilities to that of their assets (Stohs and Mauer, 1996). If debt has a shorter maturity

than assets, there is not enough cash on hand to repay the principal when it is due. Alternatively, if debt has a longer maturity, then cash flows from assets cease while debt payments remain due. Maturity matching can reduce these risks and is thus a form of corporate hedging that reduces the expected costs of financial distress. This argument suggests that debt maturity varies directly with asset maturity.

The agency perspective also predicts a positive association between asset maturity and debt maturity. Myers (1977) argues that maturity matching controls agency conflict between equityholders and debtholders by ensuring that debt repayments are scheduled to correspond with a decline in the value of assets in place.

Agency theory suggests that firms whose assets have a large proportion of growth options are likely to face greater agency problems (i.e., underinvestment and asset substitution problems). Since short-term debt is used to reduce these agency problems, such types of firms should use shorter-term debt, suggesting a negative relation between debt maturity and growth opportunity.

It has been argued in a number of studies (Smith and Warner, 1979; Grinblat and Titman, 1998) that smaller firms and firms with higher business risk are expected to have higher agency-related costs. Since these costly incentives can be reduced to some extent by issuing more short-term debt, smaller firms and firms with higher business risk potentially use shorter-term debt to curtail these problems. This argument suggests a positive relation between debt maturity and firm size and a negative relation between debt maturity and business risk.

Due to informational effects, younger and smaller firms will have shorter debt maturity. That is, younger and smaller firms tend to produce less information about themselves and thus have higher levels of information asymmetry. If markets misprice both long-term and short-term debt, the mispriced shorter term debt will be lower. In order to reduce information costs, younger and smaller firms issue shorter term debt. Therefore, age and size of firm will positively affect debt maturity. Table 4.7 summarises the theoretical relations between the firms' characteristics and debt maturity.

Table 4.7 Summary of Relationships between Firm Characteristics and Debt Maturity

Variable	References	Tax	Financial Distress	Agency Problem	Asymmetric Information
Term structure of interest	Brick and Ravid (1985) Barclay and Smith (1995a) Peirson *et al.* (2002)	Neutral			
Growth opportunity	Myer (1977) Barnea *et al.* (1980)			-	
Business risk	Grinblat and Titman (1998) Bodie and Taggart (1978)			-	
Firm size	Smith and Warner (1979) Titman and Wessel (1988)			+	+
Asset maturity	Stohs and Mauer (1996) Myers (1977)		+	+	
Firm age	Sharpe and Nguyen (1995) Barclay *et al.* (1995a)				+

4.7 Empirical Model and Measures for Leasing

Empirical Model - Hypothesis 3 proposed in section 3.5 states that *family controlled firms will employ higher proportions of leasing than non-family controlled firms*. The regression equation to test this hypothesis takes the form:

$$Lease\ Share_{it} = \beta_0 + \beta_1\ Family\ Control_i + \beta_2\ Effective\ Tax\ Rate_{it} + \beta_3\ Growth\ Opportunity_{it} + \beta_4\ Firm\ Size_{it} + \beta_5\ Asset\ Tangibility_{it} + \beta_6\ Firm\ Age_{it} + \beta_7\ Liquidity_{it} + \beta_8 Industry\ Dummy_{it} + \beta_9 Year\ Dummies + \varepsilon_{it} \quad (3)$$

The measurement of the variables in Equation (3) is reported in Table 4.8.

Table 4.8 Variable Measurement: Leasing Regression

Variable	Measure	Note
Leasing	Total lease (average) / total capital	Primary measure in Equation (3)
	Total lease (average) / total assets	Used in checks on robustness
	Total lease (10%) / total capital	Used in checks on robustness
	Total lease (10%) / total assets	Used in checks on robustness
Family control	Dummy variable (1 if family firm, 0 otherwise)	Primary measure in Equation (3)
Effective tax rate	Total tax / total taxable income	Primary measure in Equation (3)
	Total tax / total assets	Used in checks on robustness
Growth opportunity	Market to book value ratio	Primary measure in Equation (3)
	Capital expenditure / total assets	Used in checks on robustness
Firm size	Log (total assets)	Primary measure in Equation (3)
	Log (total operating revenue)	Used in checks on robustness
	Log (market capitalisation)	Used in checks on robustness
Firm age	Number of year since firm incorporation	Primary measure in Equation (3)
Asset tangibility	Net PPE / total assets	Primary measure in Equation (3)
Liquidity	Current assets / current liabilities	Primary measure in Equation (3)
	(Cash + Debtors) / current liabilities	Used in checks on robustness
Industry variables	Dummy variables (1 if mining companies, 0 otherwise – based on ASX industry classification)	Primary measure in Equation (3)
	Dummy variables (based on two digit ASX industry classification)	Used in checks on robustness

Measures - The main proxy for leasing is the proportion of total lease (i.e., financial lease assets plus present value of operating lease discounted using an average borrowing rate) to total capital. This measure has been used by previous leasing studies (e.g., Beattie *et al.*, 2000 in the U.K.; Graham *et al.*, 1998 in the U.S.). Alternative proxies for leasing are examined for robustness: total assets (instead of total capital) is used as a deflator for total lease.

Other alternative measures of leasing use the present value of the future operating lease variable discounted at **10 percent** for all companies. Two types of deflators for this alternative dependent variable are used. Firstly, values of the financial lease plus

operating lease (discounted using the firm's 10 percent rate) are expressed as a percentage of total capital, and secondly, it is expressed as a percentage of total assets. Several measures of leasing are used to increase the internal validity of the study.

Beattie *et al.* (2000) estimates that the value of operating leases are approximately thirteen times larger than for financial leases. However, companies are currently required to include only financial leases in their balance sheet and not assets that have been financed through an operating lease. Operating lease is reported in the footnotes of financial reports rather than in the balance sheet. Ignoring operating leases significantly understates the firm's use of leasing, and thus a lease capitalisation method to estimate the present value of operating leases is used (Beattie *et al.*, 2000; Bennett and Bradbury, 2003). The Association for Investment Management and Research (AIMR) and the G4+1 Group of standard setters similarly recommend use of the lease capitalisation method (Bennett and Bradbury, 2003).

This procedure has been developed by Imhoff *et al.* (1991, 1997) and is operationalised as follows: when single future lease obligations are reported (generally future lease obligation for year 1 and year 2), they are discounted directly to obtain the present value of the operating lease. However, if lump sum future rentals are reported, it is assumed that equal payments are made over the specified time period. For example, the number of lease rentals for "3-5 years" are divided equally over a three-year period (i.e., year 3, year 4 and year 5). The number for "over 5 years" is allocated based on an average lease obligation from year 1 to year 5.

There are two types of rates used to discount the amount of lease rentals: the 10 percent and the average interest rate (see Graham *et al.*, 1998; Beattie *et al.*, 2000). The discount

rate of 8 percent, 9 percent, 11 percent and 12 percent are used in this study to examine the robustness of results. Graham *et al.* (1998) argue that using a 10 percent discount rate has the potential of being biased if different firms have different costs of lease capital. They suggest using the firm's average borrowing rate as an alternative discount rate. The average borrowing rate is calculated over 5 years, from 1998 to 2002. The use of averages rather than single rates each year reduces seasonality in the interest and principal payments for each firm.

Hypothesis 3 is accepted if the coefficient on family control is positive and statistically significant. That is, a positive coefficient on family control indicates that family controlled firms in Australia employ higher proportions of leasing than their non-family counterparts.

Control variables in the leasing equation such as the effective tax rate, growth opportunity, asset tangibility, firm size and firm age have the same function as in the leverage and debt maturity equations. An additional control variable specific to the leasing equation, namely liquidity, was used in the equation. The primary measure of liquidity is current assets divided by current liabilities. Quick ratio (i.e., (cash + debtors) / current liabilities) is used as an alternate variable for liquidity. Similar to the leverage and debt maturity equations, industry and year dummies are included to control for variation in leasing decisions due to seasonal and industry differences.

Peirson *et al.* (2002) and Bishop *et al.* (2004) argue that under the Australian imputation tax system, shareholders view company income tax as a withholding tax (i.e., the effective rate of company income tax is low from the shareholders point of view).

Accordingly, any advantage by deferring company tax payments, as is often the case with leasing, is very small. The argument indicates that the effective tax rate will have an insignificant impact on leasing decisions.

Financial contracting theory implies that specific firm characteristics such as growth opportunity and size affect the magnitude of the benefits and costs of leasing. Underinvestment and asset substitution problems are more severe for smaller firms (Grinblat and Titman, 1998) and firms with higher growth opportunities (Barclay and Smith, 1995b). Therefore, these firms are expected to rely more on higher priority debt, such as leases, in order to reduce agency costs.

Smith and Wakeman (1985) argue that leases of firm-specific assets generate agency costs in the form of significant additional negotiation, administration, and enforcement costs due to conflicts between the lessor and the lessee. Therefore, firm-specific assets are less likely to be leased. In addition, a leasing contract, by definition, is tied to a specific asset. Therefore, firms that use more fixed assets in their production processes use more lease financing, which suggest that a positive association exists between asset tangibility and leasing (Graham *et al.*, 1998).

Drury and Braund (1990) and Beattie *et al.* (2000) argue that poor liquidity and cash flow problems are an important influence on the decision to lease. Lessors generally have the highest priority in bankruptcy situations because a default on a promised lease payment typically gives the lessor the right to repossess the leased asset (Barclay and Smith, 1995b). Therefore, leases have lower expected bankruptcy costs for the lessor (Krishnan and Moyer, 1994). This unique feature makes leasing a preferred financing alternative for firms with a higher potential for financial distress, as in the case of firms

which have liquidity/cash flow problems. In short, unsecured debt is too risky for firms experiencing liquidity/cash flow problems, and thus lease financing is the only form of finance available (Krishnan and Moyer, 1994; Beattie *et al.*, 2000). The argument implies that a negative association exists between leasing and liquidity.

Sharpe and Nguyen (1995) argue firms that face high costs of external capital are more inclined to lease. Older and larger firms tend to produce more information about themselves and thus have lower levels of information asymmetry. Therefore, it is expected that age and size of firm will be negatively associated with leasing. Table 4.9 summarises the theoretical relations between the firms' characteristics and its propensity to lease.

Table 4.9 Summary of Relationships between Firm Characteristics and Propensity to Lease

Variable	References	Tax	Financial Distress	Agency Problem	Asymmetric Information
Effective tax rate	Peirson *et al.* (2002) Bishop *et al.* (2004)	Neutral			
Growth opportunity	Barclay and Smith (1995b)			+	
Firm size	Grinblat and Titman (1998)			-	-
Asset tangibility	Smith and Wakeman (1985) Graham *et al.* (1998)			+	
Firm age	Sharpe and Nguyen (1995) Barclay *et al.* (1995b)				+
Liquidity	Drury and Braund (1990) Beattie *et al.*, 2000		-		

4.8 Empirical Model for Family Firms Capital Structure Decisions

Capital structure research typically focuses on one specific aspect or dimension, such as leverage, debt maturity, debt priority, debt mix, debt convertibility or leasing decisions.

However, firms use more than one of these components simultaneously to reduce information and incentive problems (Barclay *et al.*, 2003).

The corporate finance literature indicates that the agency cost of debt is controlled by using several mechanisms including lower levels of leverage, short-term debt, and leasing. In addition, these three mechanisms can be used to reduce the impact of information asymmetry. Thus, leverage, debt maturity and leasing decisions are substitutes in addressing information and incentive problems. Empirical evidence tends to support this argument. Barclay *et al.* (2003) found a negative relationship between leverage and debt maturity, indicating that they are substitutes for controlling information and incentive problems. This study takes into account Barclay *et al.*'s (2003) argument by studying leverage, debt maturity and leasing decisions simultaneously. In particular, Figure 4.1 illustrates the model employed to test Hypothesis 4:

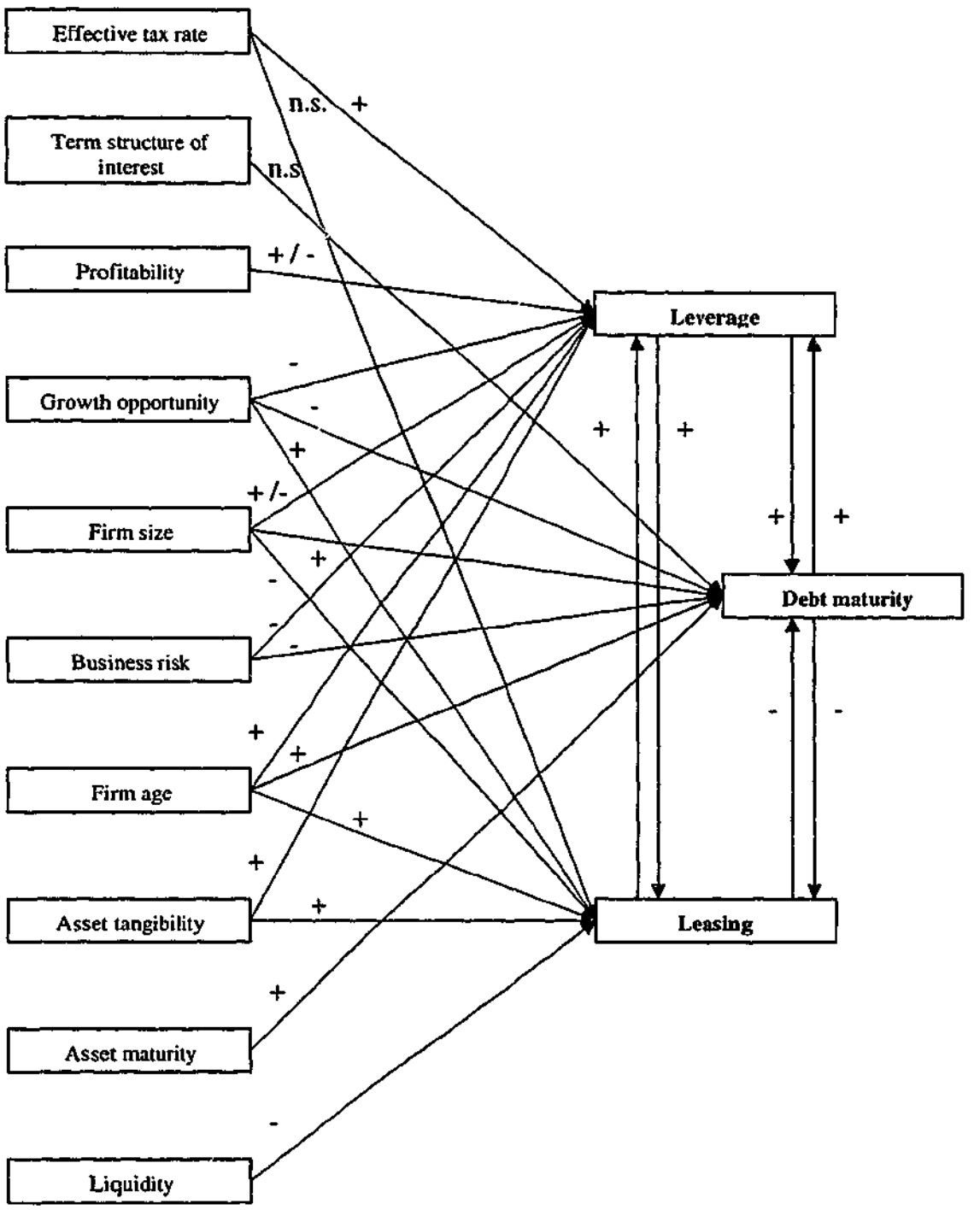

Figure 4.1 A Simultaneous Equations Model of Australian Family Controlled Firm's Capital Structure Decisions

*n.s.: not significant

This figure can be translated into a simultaneous equations system as follows:

$$Leverage_{it} = \beta_{10} + \beta_{12}\ Debt\ Maturity_{it} + \beta_{13}\ Lease\ Share_{it} + \beta_{14}\ Effective\ Tax\ Rate_{it} + \beta_{16}\ Profitability_{it} + \beta_{17}\ Growth\ Opportunity_{it} + \beta_{18}\ Firm\ Size_{it} + \beta_{19}\ Business\ Risk_{it} + \beta_{110}\ Firm\ Age_{it} + \beta_{111}\ Asset\ Tangibility_{it} + \beta_{115}\ Industry\ dummies_{it} + \beta_{116}\ Year\ dummies + \varepsilon_{it} \quad 4(a)$$

$$Debt\ Maturity_{it} = \beta_{20} + \beta_{21}\ Leverage_{it} + \beta_{23}\ Lease\ Share_{it} + \beta_{25}\ Term\ Structure\ of\ Interest_{it} + \beta_{27}\ Growth\ Opportunity_{it} + \beta_{28}\ Firm\ Size_{it} + \beta_{29}\ Business\ Risk_{it} + \beta_{210}\ Firm\ Age_{it} + \beta_{212}\ Asset\ Maturity_{it} + \beta_{215}\ Industry\ Dummy_{it} + \beta_{216}\ Year\ Dummies + \varepsilon_{it} \quad 4(b)$$

$$Lease\ Share_{it} = \beta_{30} + \beta_{31}\ Leverage_{it} + \beta_{32}\ Debt\ Maturity_{it} + \beta_{34}\ Effective\ Tax\ Rate_{it} + \beta_{37}\ Growth\ Opportunity_{it} + \beta_{38}\ Firm\ Size_{it} + \beta_{310}\ Firm\ Age_{it} + \beta_{311}\ Asset\ Tangibility_{it} + \beta_{314}\ Liquidity_{it} + \beta_{315}\ Industry\ Dummy_{it} + \beta_{316}\ Year\ Dummies + \varepsilon_{it} \quad 4(c)$$

The key coefficients of interest are the relationships among the capital structure variables: β_{12} (the impact of *debt maturity* on *leverage* decisions), β_{13} (the impact of *leasing* on *leverage* decisions), β_{21} (the impact of *leverage* on *debt maturity* decisions), β_{23} (the impact of *leasing* on *debt maturity* decisions), β_{31} (the impact of *leverage* on *leasing* decisions) and β_{32} (the impact of *debt maturity* on *leasing* decisions).

Table 4.10 summarises predictions of the relationships among capital structure variables provided by the three competing theories discussed in section 3.6: agency, asymmetric information, and financial distress theories. The relationships among capital structure decisions for family controlled firms are consistent with the financial distress argument (substitution version). It follows that directions for the coefficients β_{12}, β_{13}, β_{21}, and β_{23} are expected to be positive, whereas β_{31} and β_{32} are expected to be negative.

Table 4.10 Summary of Interactions Among Capital Structure Variables

Relationship	Agency costs hypothesis		Information costs hypothesis		Financial distress cost hypothesis	
	Substitute	**Complement**	**Substitute**	**Complement**	**Substitute**	**Complement**
Leverage → Debt maturity (β_{21})	-	+	+	-	+	-
Debt maturity → Leverage (β_{12})						
Leverage → Leasing (β_{31})	+	-	-	+	+	-
Leasing → Leverage (β_{13})						
Debt maturity → Leasing (β_{32})	+	-	+	-	-	+
Leasing →Debt maturity (β_{23})						

4.9 Data Screening and Transformation

Foster (1986) argues that recognising the empirical properties of financial ratios is important when using financial statement numbers in research. That is, failure to consider the reliability and distribution of financial data can result in using inappropriate statistical tools and drawing erroneous inferences. Therefore, data screening and transformations are needed as a preparation for data analysis.

Reliability of data – As discussed at Section 4.3, data validation was conducted to ensure the reliability of research data. Financial data in this study were collected mainly from *FinAnalysis*, a database which contains pertinent annual report information. To reduce human input error, the data from *FinAnalysis* were validated by conducting cross checks with *Company Analysis*, another database which contains annual report information.

Normality – Wherever necessary, the data were transformed to achieve normality. For example, firm age (i.e., number of years since firm incorporation) and firm size (i.e., total assets, total sales and total market capitalisation) were transformed using the natural logarithm to conform with normal distributions. However, several variables (e.g. total debt to total assets, long-term debt to total assets, profitability, business risk) were highly skewed and/or kurtosed and therefore it was not possible to transform these variables to achieve normality. Other techniques such as a tobit regression were used to overcome this problem. Foster (1986) argues that some financial ratios have technical limitation that prevent them from having normal distributions. For example, the total debt-to-total assets ratio, which has both a technical lower limit of zero and a technical

upper limit of one. In such cases, a tobit regression was used in check on the robustness of analysis.

Outliers – Descriptive statistics (i.e., mean, median, range, maximum, and minimum value), boxplots and scatterplot were used to check for significant outliers. If extreme values were found due to recording errors, the data were corrected. However, if extreme observations represent "true outliers" (i.e., extreme values which caused the denominator of the ratio to approach zero), deletion of the observation was considered. Another method used to deal with influential observations was comparing OLS coefficient (and standard error) estimates using data with and without outliers (see Kennedy, 2003).

Missing value – Although all attempts were made in order to reduce this problem, missing values are unavoidable. The missing value analysis (using the SPSS MVA) was undertaken to ensure that there were no patterns of missing data which could potentially threaten inferences derived from the study. Most of the results showed that missing data were randomly scattered.

4.10 Technique Used to Estimate Empirical Models

Panel Data Techniques - The method used to test Hypotheses 1 to 3 is the pooled data regressions procedure. Since research data contain annual information over a five-year period from 1998 to 2002 (i.e., panel data), pooled regression standard errors were calculated using the Huber-White Sandwich variance estimator (clustered). The names refer to techniques reported by Huber (1967) and White (1980) for producing this type of estimator (Gutierrez and Drukker, 2004). The name "sandwich" refers to the

mathematical form of the estimate, namely it is calculated as the product of three matrices: a matrix created by taking the outer product of the observation-level likelihood/pseudo-likelihood score vectors is used as the middle of these matrices (the meat of the sandwich), which in turn is pre- and post-multiplied by the usual model-based variance matrix (the bread of the sandwich). This estimator provides robust standard errors in the presence of violations of regression model assumptions (i.e., heteroskedasticity and serial correlation). The technique is suitable when panel data have a large number of subjects (i.e., firms), but a small number of observations per subject.

However, pooled data regressions do not address the possibility that a spurious relationship exists between family control (and other regressors) and capital structure variables because of the lack of inclusion of unmeasured explanatory variables that affect firm behaviour. Omitting these variables results in biased estimates. Panel data methodology addresses the unobserved omitted variable bias by modeling a different intercept for each cross-sectional unit. Two techniques have been suggested to incorporate different intercepts in the model (Kennedy, 2003). The first technique is to include n different intercepts, one for each cross-sectional unit (e.g., firm). These intercepts are represented by a set of binary variables, which absorb the influence of all omitted variables that differ from one entity to the next, but are constant over time. This type of model gives rise to a fixed effects estimator and the ordinary least squares procedure can be applied to such a model.

The fixed effects model, however, has two major drawbacks: first, by implicitly including n different intercepts across each cross-sectional unit, the degrees of freedom of the model are reduced significantly; second, the transformations required to estimate

this type of model eliminates explanatory variables that do not vary. In other words, any explanatory variables that are time-invariant such as industry sector, family control or board representation are unable to be incorporated into the fixed effects model.

Families are classified as long-term large shareholders as they maintain control of their companies for long periods. Thus the family control variable in this study is time-invariant over a five-year period and hence a fixed effect estimator was not used.

A second procedure that includes different intercepts is the random effect model. This procedure views different intercepts as having been drawn from a pool of possible intercepts and interpreted as random[9] and part of the error term. This composite error has two parts: one is the "random intercept" term, measuring the extent to which a firm's intercept differs from the overall intercept, whereas the other part is traditional random error, which indicates random deviation for a firm in a particular time period.

The random effects estimator assumes that observations on different firms have a zero correlation between their composite error terms. This creates a variance-covariance matrix which uses the generalised least square (GLS) procedure. The GLS calculation is performed by transforming the data, which creates a spherical covariance matrix, and an OLS is then performed on the transformed data.

The random effects model does not reduce the degrees of freedom and produces a more efficient estimator. Furthermore, the transformation used for the random effects estimation procedure does not eliminate explanatory variables that are time-invariant.

[9] Usually assumed to be normally distributed.

As family control is time invariant, the random effects modeling procedure is more appropriate and hence was used in this study.

To enhance the validity of the random effects model, the between estimator panel data technique was used. The between estimator uses time-series means for each variable by firm. By running the regression model in a single cross-section, the problem of serially correlated errors is eliminated. This regression model preserves the dispersion across firms, but exploits no time-series variation in the observation (Barclay and Smith, 1995b). Because the between estimator averages the variable's observations, it reduces bias caused by measurement error. Averaging also alleviates bias caused by correlations between error terms and explanatory variables (Kennedy, 2003).

To check the robustness of the panel data technique as well as the measures used in the empirical models, a censored (Tobit) regression analysis was employed. Tobit regression is particularly suited when models have a continuous dependent variable, but their range are constrained. This occurs when the dependent variable is zero for a substantial part of the population, but positive for the rest of the population (Verbeek, 2004).

The values of the dependent variables in this study are generally restricted to a range between zero and one. In addition, a significant proportion of companies in the sample have no debt (approximately 23 percent) or no long-term debt (approximately 36 percent) and no leasing (approximately 25 percent). Thus, a Tobit regression model was the appropriate procedure used for conducting robustness checks on the data.

Following Agrawal and Nagarajan (1990), this study also examined the probability of family firms using debt. As the dependent variable is a dummy variable; one if firms use interest bearing debt and 0 if firms have no debt, a logistic regression is employed. Two estimation methods were used: a pooled logistic regression with a Huber-White Sandwich variance estimator (clustered) adjustment and a random effects logistic regression.

Structural/Simultaneous Modelling Techniques - There are two available methods to estimate the structural equation 4(a) to 4(c): a single equation method and full information method (Kennedy, 2003). The first estimation method is called a "single equation" method, which estimates a system of simultaneous equations by estimating each equation separately. Single equations are sometimes called "limited information" methods because they only utilise knowledge of the restrictions in the particular equation being estimated. Included in this category are the ordinary least squares, indirect least squares, instrumental variables, two stage least squares (2SLS) and limited information maximum likelihood (LIML) methods.

The second method estimates all the identified structural equations simultaneously instead of each equation separately. This method is called the full information method because it utilises all the zero restrictions in the entire system when estimating structural parameters. The major advantages of this procedure are that it incorporates all available information into the estimates and it has smaller asymptotic variance-covariance matrices. The three-stage least squares (3SLS) is included in this full information procedure.

Thus a three-stage least squares (3SLS) technique procedure was used to test

Hypothesis 4. In the first stage of the procedure, each of the endogenous variables are regressed on all the exogenous variables. The fitted values from these (reduced-form) regressions are used as instruments for the corresponding endogenous variable, as they are independent of the error terms in all the structural equations. In the second stage, structural equations are estimated using the Instrumental Variable (IV) estimator, with fitted values used as the instruments. Although this stage of the procedure produces consistent estimates, they might still be inefficient (i.e., large variances of estimates) if there are cross-equation correlations among the error terms. The third and final stage corrects for this possibility by using residuals from the second stage to compute the cross-equation covariance matrix, which is then used to obtain asymptotically efficient Generalised Least Squares (GLS) estimates for all parameters in the systems.

In several analyses involving simultaneous equation models, the first two stages (i.e., two-staged least squares) are sometimes sufficient. However, the application of the third and final stage is very important in this study as it is highly likely that cross-equation correlations exist among the error terms. There are unobserved factors that influence both ownership and capital structure, and because these are omitted as regressors, they become part of the error terms in both equations. Thus, applying the GLS estimation in the final stage of the 3SLS assist in producing more efficient coefficient estimates (Pham, 2003).

4.11 Chapter Summary

This chapter provides details of research design, methodology and procedures used in this study. It began with an identification of validity threats and associated techniques to minimise it. In addition, various procedures are outlined in relation to data collection

and sample selection. Finally, a detailed description of empirical models, variable selection, variable measurement and statistical procedures is provided.

CHAPTER 5
PROFILE OF COMPANIES AND UNIVARIATE ANALYSIS

5.1 Introduction

This chapter provides descriptive and univariate analyses. The purpose is twofold: to outline initial description and univariate results that are explored in more detail in the multivariate context, and to outline distributional characteristics of the data. The remainder of the chapter is organised as follows: Section 5.2 describes the distribution of the sample across industries; section 5.3 reports descriptive statistics for panel data, and; correlations among variables and mean difference tests between family and non-family firms are analysed in section 5.4. Section 5.5 concentrates on capital structure variables, while section 5.6 focuses on the determinants of capital structure decisions.

5.2 Sample Distribution by Industry

Table 5.1 provides sample distribution statistics by industry and indicates that family controlled firms operate in a wide-range of industries. Family firms are present in all industries except diversified resources and chemicals. They are more common in the *Miscellaneous Industrials* (22.1%), *Media* (9.1%), *Retail* (8.4%) and *Developer and Contractor* (8.4%) industries.

Table 5.1 Sample Distribution by Industry

ASX IND.	INDUSTRY	Family Firms		Non-Family Firms		Total	
		No	%	No	%	No	%
1	Gold	21	13.64%	138	19.66%	159	18.57%
2	Other metals	10	6.49%	91	12.96%	101	11.80%
3	Diversified resources	0	0.00%	15	2.14%	15	1.75%
4	Energy	3	1.95%	53	7.55%	56	6.54%
	TOTAL MINING	34	22.08%	297	42.31%	331	38.67%
	Chi square test		***χ^2 = 25.06; p-value = 0.000***				
5	Infrastructure and utilities	1	0.65%	14	1.99%	15	1.75%
6	Developers and contractors	13	8.44%	29	4.13%	42	4.91%
7	Building materials	6	3.90%	16	2.28%	22	2.57%
8	Alcohol and tobacco	1	0.65%	15	2.14%	16	1.87%
9	Food and household	6	3.90%	21	2.99%	27	3.15%
10	Chemicals	0	0.00%	5	0.71%	5	0.58%
11	Engineering	5	3.25%	22	3.13%	27	3.15%
12	Paper and packaging	1	0.65%	7	1.00%	8	0.93%
13	Retail	13	8.44%	21	2.99%	34	3.97%
14	Transport	4	2.60%	9	1.28%	13	1.52%
15	Media	14	9.09%	18	2.56%	32	3.74%
18	Telecommunication	5	3.25%	24	3.42%	29	3.39%
21	Healthcare and biotechnology	9	5.84%	46	6.55%	55	6.43%
22	Miscellaneous industrials	34	22.08%	113	16.10%	147	17.17%
23	Diversified industrials	4	2.60%	19	2.71%	23	2.69%
24	Tourism and leisure	4	2.60%	26	3.70%	30	3.50%
	TOTAL INDUSTRIALS	120	77.92%	405	57.69%	525	61.33%
	Chi square test		***χ^2 = 127.22; p-value = 0.000***				
	TOTAL	154	100.00%	702	100.00%	856	100.00%
	Chi square test		***χ^2 = 287.86; p-value = 0.000***				

Chi square tests examine whether the industry distributions of family firms is different from non-family firms. The Chi square statistics of 287.86 (for entire sample), 25.06 (for mining) and 127.22 (for industrial) confirm that family firms predominate in industries such as *Miscellaneous Industrials*, *Retail* and *Developer Contractor*. In particular, the presence of family firms is strong in industries with high amenity potential such as *media*. Demsetz and Lehn (1985) argue that by participating in the media industry, families influence social and political affairs, and therefore enjoy valuable private benefits of control.

In contrast, not many family firms operate in industries such as *diversified resources*, *energy* and *infrastructure*. These industries require significant amounts of investment. Due to financial constraint, families are unable to finance projects without sharing control with other shareholders.

5.3 Descriptive Statistics

Table 5.2 presents descriptive information for the entire sample. In particular, it provides a list of variables used and their corresponding measures such as means, standard deviations, and maximum and minimum values. The table indicates the presence of outliers. For example, the maximum value of leverage (book value) is 3.66. This value indicates that a firm borrows nearly four times its asset value. This case is commonly found in financially distressed firms. Outliers are also present for variables such as debt maturity (book value), effective tax rate, business risk, and asset maturity.

Table 5.2 Descriptive Statistics

Variable	Definition	Mean	Std. Dev.	Min.	Max.
Leverage (book value)	Book value of total debt / total assets	0.2000	0.3397	0.0000	3.6600
Leverage (market value)	Book value of total debt / (market value of equity + book value of debt)	0.2135	0.2351	0.0000	0.9700
Debt maturity (book value)	Book value of total long-term debt / total assets	0.1277	0.2910	0.0000	2.7300
Debt maturity (market value)	Book value of total long-term debt / (market value of equity + book value of debt)	0.1313	0.1774	0.0000	0.9500
Leasing (Market value)	(Financial lease + Operating lease capitalisation) / total assets	0.0678	0.2429	0.0000	2.0414
Leasing (Book value)	(Financial lease + Operating lease capitalisation) / (market value of equity + book value of debt)	0.0806	0.2248	0.0000	2.6561
Effective tax rate	Tax paid / pretax income	0.1300	1.8512	-10.23	19.50
Growth opportunity	Market to book value ratio	1.4910	1.9543	0.0800	20.37
Firm size	Log (total assets)	17.53	2.1693	12.60	24.91
Business risk	Standard deviation of EBIT in the previous 5 years	18.12	158.94	0.0000	1927.42
Firm age	The number of year since firm incorporation	24.23	21.91	1.0000	161.00
Profitability	EBIT / total assets	-0.1108	2.3456	-11.23	10.44
Asset tangibility	Net PPE / total assets	0.2586	0.2518	0.0000	0.9700
Asset maturity	(Current asset/total revenue) x (Current asset / (Current asset + net PPE)) + (Net PPE/depreciation) x (Net PPE/(Current asset + net PPE))	27.60	217.72	0.0010	2630.24
Liquidity	Current assets / current liabilities	6.2651	20.78	0.0000	234.59

5.4 Correlation Analysis

Table 5.3 reports various correlations among variables used in this study. Panel A focuses on correlations among capital structure variables, while Panels B, C and D present associations among variables used in the leverage, debt maturity and lease analyses respectively.

Several important findings emerge from the correlation analysis. As reported in Panel A, correlations among capital structure variables are generally positive and statistically significant. The results indicate that leverage, debt maturity and leasing decisions are jointly determined to address agency, information, and financial distress problems. Associations will be examined in more detail in Chapter 8 within the simultaneous equation framework.

Correlations between family control and capital structure variables are generally positive and statistically significant, regardless of whether the variable was measured using book value or market value. Family control is positively associated with leverage (see Panel B), debt maturity (Panel C) and lease share (Panel D), suggesting that family firms in Australia use higher levels of debt, longer term debt maturity, and higher proportions of lease. The results seem to support Hypotheses 1, 2 and 3 respectively. However, the results need to be explored in more detail within the multivariate framework to ensure that they are not distorted by other factors.

In addition, correlations among independent variables such as effective tax rate, profitability, firm size, business risk, growth opportunity, firm age, asset maturity, asset

tangibility, and liquidity are generally low. The maximum correlation coefficient among the independent variables is around -0.41 (i.e., the correlation between profitability and growth opportunity – Panel B), suggesting that multicollinearity is not a potential threat to multiple regression analyses.

Table 5.3 Correlation Analysis

Panel A: Correlations Among Capital Structure Variables

	Leverage (MV)	Leverage (BV)	Debt maturity (MV)	Debt maturity (BV)	Leasing (MV)	Leasing (BV)
Leverage (MV)	1.000					
Leverage (BV)	0.519***	1.000				
Debt maturity (MV)	0.788***	0.422***	1.000			
Debt maturity (BV)	0.294***	0.762***	0.404***	1.000		
Leasing (MV)	0.229***	0.057***	0.201***	0.027*	1.000	
Leasing (BV)	0.100***	0.269***	0.269***	0.073***	0.548***	1.000

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel B: Correlations Between Leverage and Firms Characteristics

	Leverage (MV)	Leverage (BV)	Family control	Effective tax rate	Growth Opportunity	Firm size	Business risk	Firm age	Profit-ability	Asset tangibility
Leverage (MV)	1.000									
Leverage (BV)	0.519***	1.000								
Family control	0.111***	0.068***	1.000							
Effective tax rate	0.018	0.003	0.008	1.000						
Growth opportunity	-0.233***	0.148***	-0.021	-0.019	1.000					
Firm size	0.366***	0.116***	0.002	0.063***	-0.277***	1.000				
Business risk	0.019	0.018	-0.027	0.010	-0.002	0.216***	1.000			
Firm age	0.010	-0.010	0.074***	0.002	-0.034**	0.084***	0.013	1.000		
Profitability	0.124***	-0.070***	0.059***	0.023	-0.406***	0.262***	0.024	0.023	1.000	
Asset tangibility	0.373***	0.176***	0.008	-0.014	0.022	0.390***	0.028	0.009	0.114***	1.000

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel C: Correlations Between Debt Maturity and Firm Characteristics

	Debt maturity (MV)	Debt maturity (BV)	Family control	Effective tax rate	Growth opportunity	Firm size	Business risk	Firm age	Asset maturity
Debt maturity (MV)	1.000								
Debt maturity (BV)	0.404***	1.000							
Family control	0.100***	0.071***	1.000						
Effective tax rate	0.043***	0.010	0.008	1.000					
Growth opportunity	-0.189***	0.089***	-0.021	-0.019	1.000				
Firm size	0.435***	0.096***	0.002	0.063***	-0.277***	1.000			
Business risk	0.036**	0.017	-0.027	0.010	-0.002	0.216***	1.000		
Firm age	0.023	0.014	0.074***	0.002	-0.034**	0.084***	0.013	1.000	
Asset maturity	-0.008	-0.007	-0.006	-0.009	0.022	-0.069***	-0.009	-0.035	1.000

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel D: Correlations Between Leasing and Firm Characteristics

	Leasing (MV)	Leasing (BV)	Family control	Effective tax rate	Growth opportunity	Firm size	Business risk	Firm age	Liquidity	Asset tangibility
Leasing (MV)	1.000									
Leasing (BV)	0.548***	1.000								
Family control	0.131***	0.103***	1.000							
Effective tax rate	0.012	0.003	0.008	1.000						
Growth opportunity	0.110***	0.108***	-0.021	-0.019	1.000					
Firm size	0.106***	0.018	0.002	0.063***	-0.277***	1.000				
Business risk	-0.016	-0.010	-0.027	0.010	-0.002	0.216***	1.000			
Firm age	0.014	0.011	0.074***	0.002	-0.034**	0.084***	0.023	1.000		
Liquidity	-0.062***	-0.047***	-0.059***	-0.014	0.003	-0.157***	-0.016	0.016	1.000	
Asset tangibility	0.036**	0.017	0.057***	0.014	-0.017	0.154***	0.061***	-0.007	-0.077***	1.000

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

5.5 Capital Structure Characteristics

Table 5.4 provides the mean values for family and non-family controlled firms and the test statistics for mean differences. Two types of statistics are reported in Table 5.4: the parametric independent *t*-test for mean differences (assuming equal variances) and the nonparametric Mann-Whitney U test.

Table 5.4 Difference of Means Tests (Capital Structure Variables)

Panel A: All Firms

Category	Measure	Statistics	Family Firm	Non-Family Firms	Tests statistics
Leverage	Market Value	Mean[1]	0.2556	0.1907	6.972***
		Median[2]	0.2088	0.0950	-8.023***
	Book Value	Mean	0.2506	0.1860	4.233***
		Median	0.1688	0.1063	-6.321***
Debt maturity	Market Value	Mean	0.1591	0.1155	6.237***
		Median	0.0859	0.0132	-7.454***
	Book Value	Mean	0.1857	0.1135	4.443***
		Median	0.0818	0.0133	-6.811***
Leasing	Market Value	Mean	0.1337	0.0624	8.177***
		Median	0.0239	0.0104	-7.264***
	Book Value	Mean	0.1213	0.0535	6.463***
		Median	0.0234	0.0120	-6.744***

[1] *t* test

[2] Mann-Whitney U test

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel B: Mining Firms

Category	Measure	Statistics	Family Firm	Non-Family Firms	Tests statistics
Leverage	Market Value	Mean[1]	0.1362	0.1130	1.506
		Median[2]	0.0071	0.0082	-0.577
	Book Value	Mean	0.2413	0.1237	4.446***
		Median	0.0075	0.0104	-0.390
Debt maturity	Market Value	Mean	0.0696	0.0655	2.089**
		Median	0.0000	0.0000	-0.197
	Book Value	Mean	0.1928	0.0631	7.627***
		Median	0.0000	0.0000	-0.094
Leasing	Market Value	Mean	0.0167	0.0221	-0.648
		Median	0.0014	0.0023	-1.139
	Book Value	Mean	0.0131	0.0209	-0.976
		Median	0.0023	0.0026	-1.488

[1] *t* test

[2] Mann-Whitney U test

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel C: Industrial Firms

Category	Measure	Statistics	Family Firm	Non-Family Firms	Tests statistics
Leverage	Market Value	Mean[1]	0.2881	0.2494	3.400***
		Median[2]	0.2531	0.1954	-4.258***
	Book Value	Mean	0.2532	0.2330	1.051
		Median	0.1989	0.1990	-2.226**
Debt maturity	Market Value	Mean	0.1780	0.1533	2.844***
		Median	0.1227	0.0834	-4.182***
	Book Value	Mean	0.1838	0.1515	1.411
		Median	0.1133	0.0827	-3.224***
Leasing	Market Value	Mean	0.1655	0.0928	5.947***
		Median	0.0394	0.0268	-4.110***
	Book Value	Mean	0.1508	0.0780	4.823***
		Median	0.0390	0.0300	-3.677***

[1] *t* test

[2] Mann-Whitney U test

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel A reports differences in capital structure decision between family and non-family firms for the entire sample. In terms of book value (market value) of leverage, family controlled firms employ about 25 percent (26%) of debt in their capital structure versus 18 percent (19%) for non-family firms. These differences are supported by the independent-samples *t*-test and Mann-Whitney U test, suggesting that family firms use debt as a means of concentrating voting power. The findings support the correlation analysis, which indicates a positive association between leverage and family control.

The means difference test for debt maturity and leasing also support results from the correlation analysis. In terms of the market value measure, 16 percent of total capital of

family firms is long-term debt while for non-family firms it is 12 percent. In addition, Panel A demonstrates that family firms use leasing twice as much than their non-family counterparts (13% versus 6%). The finding that family firms use longer term debt maturity and higher proportion of debt are consistent with arguments that families use debt maturity and debt priority structure (i.e., leasing) to reduce the probability of financial distress, an event that adversely affects the families' financial investment, human capital, and private benefits of control.

Panels B and C present the results of mean difference tests for *Mining* and *Industrials* respectively. Most leverage, debt maturity, and leasing proxies for family firms in the industrials sectors are consistently higher than that for non-family firms. Interestingly, these differences disappear for mining firms.

The dynamics of capital structure over the period of analysis (from 1998 to 2002) are reported in Table 5.5. Panel A describes the behaviour of capital structure over time for the entire sample, while the other two panels present time-series figures for Mining (Panel B) and Industrial (Panel C).

To test whether changes in capital structure variables over time are significant, two tests were conducted: a parametric one-way analysis of variance (ANOVA) and a non-parametric Kruskal Wallis test. In general, the statistical tests show that the capital structure variables are stable over time. Both ANOVA and Kruskal-Wallis tests show no differences in leverage, debt maturity and leasing decisions over time. The results apply for both family and non-family firms and hold for mining and industrials sectors.

Table 5.5 Capital Structure Variables 1998 - 2002

Panel A: All firms

			1998	1999	2000	2001	2002	Anova	Kruskal Wallis
Leverage	Market value	Family firm	0.2336	0.2438	0.2688	0.2727	0.2623	0.749	1.682
		Non-family firms	0.1956	0.1946	0.1832	0.1951	0.1842	0.460	3.925
		All	0.2029	0.2042	0.2000	0.2106	0.1999	0.258	2.327
	Book value	Family firm	0.2163	0.2358	0.2448	0.2406	0.3242	1.111	2.435
		Non-family firms	0.1738	0.1957	0.1685	0.1890	0.2060	1.195	4.065
		All	0.1819	0.2034	0.1833	0.1991	0.2298	1.948	4.022
Debt maturity	Market value	Family firm	0.1478	0.1545	0.1668	0.1651	0.1627	0.283	0.230
		Non-family firms	0.1211	0.1194	0.1169	0.1146	0.1036	0.972	5.581
		All	0.1262	0.1263	0.1267	0.1247	0.1155	0.536	3.856
	Book value	Family firm	0.1450	0.2699	0.1601	0.1588	0.1934	0.841	0.977
		Non-family firms	0.1059	0.1174	0.1101	0.1177	0.1175	0.226	5.292
		All	0.1134	001476	0.1199	0.1259	0.1328	0.852	4.774
Leasing	Market value	Family firm	0.1353	0.1206	0.1290	0.1310	0.1549	0.208	1.351
		Non-family firms	0.0683	0.0585	0.0569	0.0643	0.0639	0.460	1.050
		All	0.0815	0.0710	0.0713	0.0779	0.0825	0.483	1.108
	Book value	Family firm	0.0988	0.1039	0.0979	0.1598	0.1523	0.552	1.132
		Non-family firms	0.0558	0.0570	0.0499	0.0520	0.0521	0.276	1.319
		All	0.0642	0.0663	0.0594	0.0740	0.0726	0.396	2.022

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel B: Mining firms

			1998	1999	2000	2001	2002	Anova	Kruskal Wallis
Leverage	Market value	Family firm	0.1083	0.1338	0.1353	0.1368	0.1727	0.350	1.578
		Non-family firms	0.1258	0.1274	0.1026	0.1079	0.0989	1.422	7.294
		All	0.1235	0.1277	0.1059	0.1107	0.1069	0.877	6.635
	Book value	Family firm	0.1372	0.1769	0.2695	0.2400	0.4062	1.138	2.127
		Non-family firms	0.1186	0.1305	0.1037	0.1164	0.1511	1.047	4.985
		All	0.1203	0.1353	0.1215	0.1295	0.1793	1.627	5.257
Debt maturity	Market value	Family firm	0.0728	0.0892	0.0900	0.0873	0.1125	0.167	0.130
		Non-family firms	0.0743	0.0738	0.0665	0.0609	0.0496	1.581	4.514
		All	0.0739	0.0753	0.0689	0.0636	0.0563	0.909	3.554
	Book value	Family firm	0.0995	0.1370	0.1942	0.1733	0.3826	1.476	0.134
		Non-family firms	0.0660	0.0704	0.0603	0.0613	0.0566	0.505	3.544
		All	0.0695	0.0776	0.0747	0.0734	0.0927	0.518	2.771
Leasing	Market value	Family firm	0.0129	0.0184	0.0151	0.0180	0.0197	0.128	1.938
		Non-family firms	0.0266	0.0192	0.0152	0.0263	0.0232	0.569	2.366
		All	0.0250	0.0191	0.0151	0.0253	0.0228	0.554	1.907
	Book value	Family firm	0.0100	0.0139	0.0152	0.0093	0.0176	0.348	3.408
		Non-family firms	0.0212	0.0278	0.0160	0.0191	0.0198	0.495	0.219
		All	0.0199	0.0261	0.0159	0.0179	0.0195	0.486	0.201

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel C: Industrial firms

			1998	1999	2000	2001	2002	Anova	Kruskal Wallis
Leverage	Market value	Family firm	0.2685	0.2738	0.3046	0.3092	0.2863	0.690	1.996
		Non-family firms	0.2475	0.2444	0.2431	0.2626	0.2512	0.357	0.783
		All	0.2528	0.2519	0.2588	0.2749	0.2604	0.677	1.310
	Book value	Family firm	0.2382	0.2520	0.2381	0.2408	0.3015	0.399	2.317
		Non-family firms	0.2145	0.2439	0.2164	0.2452	0.2490	0.674	0.882
		All	0.2204	0.2460	0.2219	0.2441	0.2627	0.896	1.532
Debt maturity	Market value	Family firm	0.1687	0.1724	0.1874	0.1860	0.1761	0.250	0.136
		Non-family firms	0.1558	0.1532	0.1543	0.1562	0.1460	0.163	0.954
		All	0.1590	0.1581	0.1628	0.1641	0.1539	0.212	0.727
	Book value	Family firm	0.1576	0.3062	0.1509	0.1549	0.1410	1.108	1.144
		Non-family firms	0.1352	0.1522	0.1471	0.1614	0.1652	0.384	1.834
		All	0.1408	0.1913	0.1480	0.1597	0.1589	0.789	2.249
Leasing	Market value	Family firm	0.1694	0.1485	0.1596	0.1614	0.1911	0.207	1.985
		Non-family firms	0.0991	0.0875	0.0880	0.0938	0.0957	0.219	2.470
		All	0.1168	0.1032	0.1064	0.1118	0.1210	0.485	4.253
	Book value	Family firm	0.1233	0.1284	0.1201	0.2003	0.1896	0.558	0.951
		Non-family firms	0.0812	0.0785	0.0749	0.0775	0.0774	0.074	1.568
		All	0.0917	0.0913	0.0864	0.1101	0.1069	1.729	2.470

5.6 Financial Characteristics

This section discusses univariate analyses for the independent variables (i.e., financial characteristics) and provides the mean values for family and non-family controlled firms. Similar to the capital structure variables, two types of statistical tests were conducted: parametric independent *t*-test for mean differences (assuming equal variances) and nonparametric Mann-Whitney U tests. Table 5.6 Panel A presents results for entire sample, while Panels B and C report the results for the mining and industrials sectors.

The average profitability (measured by return on assets (ROA)) is higher for family firms than for non-family firms (-3 % versus -15 %). The result is supported by both parametric and non-parametric tests. This suggests that family firms are better performers and is consistent with previous empirical studies (e.g., Anderson and Reeb, 2003a; McConaughy *et al.*, 1998). Interestingly, the profitability of family firms is higher among industrials firms compared with non-family firms (see Panel C), but is insignificant among mining firms (see Panel B).

Using the standard deviation of EBIT in the previous 5 years as a measure of business risk, family firms shows significantly lower business risk than non-family firms. When the sample is divided into two groups based on industry (i.e., mining and industrial) the results are the same. Overall, these results are consistent with the perspective that family controlled firms reduce the risk of their undiversified investments.

Table 5.6 Tests of Mean Differences (Financial Characteristics)
Panel A: All Firms

Measure	Statistics	Family Firm	Non-Family Firms	Statistic tests
Effective tax rate	Mean[1]	0.1521	0.1145	0.523
	Median[2]	0.0000	0.0000	-3.715***
Firm size	Mean	17.4061	17.3956	0.116
	Median	17.2590	17.0603	-1.765*
Growth opportunity	Mean	1.4919	1.6140	-1.334
	Median	0.8636	0.9786	-3.769***
Business risk	Mean	8.2634	26.7755	-3.177***
	Median	1.5572	1.9038	-2.512**
Firm age	Mean	36.0205	23.6081	4.650***
	Median	17.0000	15.0000	-4.962***
Profitability	Mean	-0.0295	-0.1470	3.676***
	Median	0.0374	-0.0151	-7.414***
Asset tangibility	Mean	0.2501	0.2453	0.475
	Median	0.1961	0.1462	-2.011**
Asset maturity	Mean	45.1863	50.5483	-0.346
	Median	4.2018	5.1504	-3.016***
Liquidity	Mean	3.9467	8.3216	-3.677***
	Median	1.4574	1.6100	-4.781***

[1] *t* test

[2] Mann-Whitney U test

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel B: Mining Firms

Measure	Statistics	Family Firm	Non-Family Firms	Statistic tests
Effective tax rate	Mean[1]	-0.0392	0.0856	-1.617
	Median[2]	0.0000	0.0000	-4.155***
Firm size	Mean	16.1919	16.7958	-3.480***
	Median	16.0280	16.3578	-2.783***
Growth opportunity	Mean	1.9750	1.6161	2.003**
	Median	0.9266	1.0553	-0.543
Business risk	Mean	2.6736	20.5217	-4.662***
	Median	0.8206	1.0894	-3.233***
Firm age	Mean	64.8204	21.1772	5.204***
	Median	14.0000	16.0000	-2.617***
Profitability	Mean	-0.2230	-0.2015	-0.428
	Median	-0.0733	-0.0724	-1.470
Asset tangibility	Mean	0.1577	0.2261	-3.091***
	Median	0.0231	0.0639	-3.787***
Asset maturity	Mean	117.0205	89.9547	0.523
	Median	9.9971	8.9225	-0.008
Liquidity	Mean	6.7603	12.6080	-1.698*
	Median	2.4213	2.2845	-1.305

[1] *t* test

[2] Mann-Whitney U test

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel C: Industrial Firms

Measure	Statistics	Family Firm	Non-Family Firms	Statistic tests
Effective tax rate	Mean[1]	0.2043	0.1363	0.671
	Median[2]	0.1987	0.0338	-2.973***
Firm size	Mean	17.7374	17.8479	-1.064
	Median	17.5566	17.6429	-0.227
Growth opportunity	Mean	1.3599	1.6123	-2.302**
	Median	0.8389	0.9381	-3.301
Business risk	Mean	9.7078	31.6462	-2.244**
	Median	1.8271	2.5912	-4.486***
Firm age	Mean	28.1618	25.4370	2.394**
	Median	19.0000	15.0000	-6.157***
Profitability	Mean	0.0235	-0.1059	3.098***
	Median	0.0610	0.0379	-6.010***
Asset tangibility	Mean	0.2754	0.2598	1.391
	Median	0.2253	0.1981	-2.660***
Asset maturity	Mean	33.7781	29.4395	0.308
	Median	4.0470	4.0558	-0.011
Liquidity	Mean	3.1777	5.0948	-2.325
	Median	1.4089	1.3923	-1.997**

[1] *t* test

[2] Mann-Whitney U test

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

In case of industrial firms, there are no size differences between family and non-family firms. However, family firms operating in the mining industry are significantly smaller than non-family firms. Also, mining family firms invest less in property, plant and equipment. These figures indicate the financial constraints experienced by family firms. In terms of firm size, families face a tradeoff. On the one hand, they do not want to

share control with other shareholders. On the other hand, they have limited wealth. As a result, families with a strong desire to maintain dominance over a firm, smaller firms are preferable especially in capital intensive industries such as mining.

Australian family firms operating in both the mining and industrials sectors are older than non-family firms. The result is contrary to Anderson and Reeb (2003a). They found that family firms in the US are significantly younger than their non-family counterparts. However, the evidence in Australia supports the argument that families have longer-term investment horizons. That is, founders control their firms for longer periods with the expectation to pass the business on to their heirs.

The evidence that family firms have lower liquidity is puzzling. Since lower liquidity more likely results in default payments to supplier and lenders, it is expected that firms with higher liquidity have shareholders who are not well diversified (as is often the case with family-controlled companies). A possible explanation is that family firms rely more on debt to finance their working capital requirements (see previous sections). Since higher debt increases the probability of financial distress, family firms try to efficiently manage their liquidity in order to reduce the amount of debt owing.

Agency theory provides another possible explanation. Liquidity is related to free cash flow. That is, higher liquidity leads to higher free cash flow. As indicated by agency theory, free cash flow is positively associated with the agency cost of equity. In other words, managers only pay "excessive perks" if firms have the cash flow to cover it. Similarly, entrenched managers undertake wasteful investment projects if the firm has what Jensen (1986) calls "free cash flow" (i.e., cash flow from operations over which

managers have discretionary spending power). In order to reduce this agency cost, families choose to have lower liquidity levels.

The dynamics of firm financial characteristics over time are reported in Table 5.7. Panel A describes the behaviour of financial characteristics from 1992 to 2002 for the full sample, whereas the other two panels present time-series results for Mining (Panel B) and Industrial (Panel C) firms. Similar to the capital structure variables, two statistical tests were conducted: a parametric one-way analysis of variance (ANOVA) and a non-parametric Kruskal Wallis test.

In general, the statistical tests show that the financial characteristics of family firms in Australia are stable over time. In contrast, there are several financial indicators of non-family firms that change over time. For example, the one-way ANOVA and Kruskal Wallis tests show that the profitability of family firms is more stable compared to non-family firms in both the mining and industrial sectors. The result is not surprising as family firms in Australia tend to choose businesses with lower risk (see the results from the means difference tests). The stability of other financial ratio for family firms such as growth opportunity, investment in tangible assets and liquidity suggest that these firms are resistant to change.

Table 5.7 Financial Characteristics 1998 - 2002

Panel A: All firms

		1998	1999	2000	2001	2002	Anova	Kruskal Wallis
Effective tax rate	Family firm	0.1556	0.1226	0.0792	0.1072	0.3082	0.774	7.091
	Non-family firms	0.2231	0.1706	0.0660	-0.0538	0.1488	1.993*	24.623***
	All	0.2100	0.1613	0.0690	-0.0206	0.1810	2.149*	30.158***
Firm size	Family firm	17.3145	17.3902	17.5357	17.3783	17.4183	0.264	1.367
	Non-family firms	17.3748	17.3523	17.5162	17.4126	17.3189	0.668	2.486
	All	17.3636	17.3607	17.5209	17.4063	17.3389	0.822	3.100
Growth opportunity	Family firm	1.3211	1.5151	1.7068	1.4564	1.4651	0.707	4.489
	Non-family firms	1.3075	1.7059	1.7184	1.5823	1.7901	4.355***	44.721***
	All	1.3107	1.6675	1.7148	1.5567	1.7245	4.650***	39.310***
Business risk	Family firm	7.1586	7.6915	9.1375	7.7453	9.7285	0.119	11.279**
	Non-family firms	15.0183	16.8714	28.0903	38.3135	37.6324	0.761	19.292***
	All	13.4594	15.0245	24.3262	32.0643	32.0437	0.777	27.945***
Firm age	Family firm	35.9518	37.2822	38.6218	39.8808	27.7483	0.163	13.075**
	Non-family firms	22.2511	22.9863	23.6635	24.3980	25.0705	0.177	62.123***
	All	24.9811	25.8745	26.6811	27.5919	25.6099	0.179	73.302***

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel A: All firms - *continued*

		1998	1999	2000	2001	2002	Anova	Kruskal Wallis
Profitability	Family firm	-0.0261	-0.0143	-0.0912	0.0857	-0.1050	0.468	7.339
	Non-family firms	-0.1109	-0.1117	-0.0967	-0.2078	-0.2232	6.561***	20.072***
	All	-0.0938	-0.0920	-0.0953	-0.1481	-0.1995	2.644**	25.800***
Asset tangibility	Family firm	0.2557	0.2660	0.2481	0.2497	0.2283	0.519	1.730
	Non-family firms	0.2610	0.2471	0.2383	0.2414	0.2365	0.959	3.681
	All	0.2600	0.2509	0.2403	0.2432	0.2349	1.193	4.257
Asset maturity	Family firm	23.5572	20.2815	63.7429	64.8536	55.6439	0.390	6.084
	Non-family firms	39.2265	23.6602	48.8782	90.3385	50.0079	2.601**	1.692
	All	35.8020	22.8765	52.0265	84.7672	51.1919	2.676**	2.173
Liquidity	Family firm	5.2909	4.0242	4.4449	3.2453	2.4959	0.977	3.297
	Non-family firms	8.2656	7.0965	11.6653	7.2467	7.2128	2.229*	7.904*
	All	7.6732	6.4796	10.2186	6.4253	6.2627	2.442**	7.335

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel B: Mining firms

		1998	1999	2000	2001	2002	Anova	Kruskal Wallis
Effective tax rate	Family firm	-0.0557	-0.0072	0.0746	-0.1726	-0.0395	1.827	1.894
	Non-family firms	0.0835	0.1751	0.0426	0.0177	0.1038	1.024	0.554
	All	0.0690	0.1554	0.0471	-0.0022	0.0878	1.148	0.994
Firm size	Family firm	16.4567	16.3126	16.2138	16.0572	15.8472	0.815	4.573
	Non-family firms	16.8954	16.7974	16.8935	16.7349	16.6371	0.665	2.045
	All	16.8498	16.7474	16.8254	16.6646	16.5496	0.992	3.432
Growth opportunity	Family firm	1.8250	1.8746	2.2062	1.7709	2.2353	0.221	0.915
	Non-family firms	1.2105	1.4111	1.6766	1.7205	2.1359	7.385***	62.817***
	All	1.2808	1.4636	1.7316	1.7245	2.1467	6.801***	57.564***
Business risk	Family firm	2.5400	2.9745	2.2894	2.6355	2.9403	0.070	1.009
	Non-family firms	13.0049	14.5268	19.0683	29.6191	27.7358	0.790	7.371
	All	11.9071	13.3226	17.2747	26.7288	25.0309	0.784	6.962
Firm age	Family firm	70.6389	72.8286	77.7879	80.2500	89.2903	0.214	7.812*
	Non-family firms	19.9063	20.3692	20.9142	22.1622	22.8112	1.367	29.372***
	All	25.6585	26.3365	27.2748	28.6781	22.4214	0.146	34.294***

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel B: Mining firms - *continued*

		1998	1999	2000	2001	2002	Anova	Kruskal Wallis
Profitability	Family firm	-0.0922	-0.1446	-0.2221	-0.2930	-0.3920	1.698	5.439
	Non-family firms	-0.1508	-0.1823	-0.1593	-0.2894	-0.2352	2.336**	9.681**
	All	-0.1429	-0.1769	-0.1653	-0.2884	-0.2526	3.112**	13.952***
Asset tangibility	Family firm	0.1757	0.1743	0.1352	0.1429	0.1571	0.178	0.443
	Non-family firms	0.2313	0.2235	0.2233	0.2298	0.2223	0.063	0.839
	All	0.2253	0.2183	0.2139	0.2205	0.2151	0.088	13.970***
Asset maturity	Family firm	125.6301	54.2869	13.2663	72.8241	300.9875	0.910	4.200
	Non-family firms	33.2497	41.8658	58.0417	198.4031	101.3577	3.872***	5.747
	All	41.2420	42.8582	52.8246	186.3663	122.6665	3.660***	3.959
Liquidity	Family firm	8.0894	7.8839	6.3185	7.0003	4.1709	0.673	4.192
	Non-family firms	12.1878	11.0919	19.0766	10.6728	9.8558	1.877	5.288
	All	11.6990	10.7016	17.6175	10.2361	9.2264	1.867	6.053

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel C: Industrial firms

		1998	1999	2000	2001	2002	Anova	Kruskal Wallis
Effective tax rate	Family firm	0.2142	0.1583	0.0805	0.1824	0.4045	0.880	7.525
	Non-family firms	0.3262	0.1672	0.0832	-0.1094	0.1836	1.610	28.731***
	All	0.2982	0.1649	0.0825	-0.0324	0.2411	1.729	34.081***
Firm size	Family firm	17.5525	17.6849	17.8855	17.7336	17.8532	0.572	3.605
	Non-family firms	17.7279	17.7641	17.9772	17.9381	17.8528	0.810	2.560
	All	17.6841	17.7440	17.9540	17.8844	17.8529	1.199	4.566
Growth opportunity	Family firm	1.1805	1.4160	1.5728	1.3697	1.2588	0.784	4.641
	Non-family firms	1.3795	1.9238	1.7495	1.4749	1.5161	3.018**	11.511**
	All	1.3294	1.7946	1.7044	1.4477	1.4483	3.479***	14.441***
Business risk	Family firm	8.3504	8.8708	10.9215	9.0444	11.5632	0.126	13.087**
	Non-family firms	16.5861	18.7039	35.0203	45.2314	45.2571	0.418	13.741***
	All	14.4630	16.1207	28.8398	35.5487	36.5391	0.434	24.305***
Firm age	Family firm	26.3462	27.5625	28.1138	29.0252	30.0893	0.525	8.819*
	Non-family firms	23.9695	24.9180	25.6989	26.1317	26.8396	0.695	35.151***
	All	24.5602	25.5870	26.3113	26.8918	27.6860	1.166	41.806***

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel C: Industrial firms – *continued*

		1998	1999	2000	2001	2002	Anova	Kruskal Wallis
Profitability	Family firm	-0.0078	0.0217	-0.0561	0.1884	-0.0248	0.486	5.746
	Non-family firms	-0.0817	-0.0594	-0.0505	-0.1444	-0.2138	5.435***	14.445***
	All	-0.0632	-0.0389	-0.0519	-0.0573	-0.1648	1.438	18.787***
Asset tangibility	Family firm	0.2779	0.2911	0.2783	0.2785	0.2481	0.584	2.093
	Non-family firms	0.2829	0.2646	0.2493	0.2504	0.2476	1.403	4.353
	All	0.2816	0.2713	0.2567	0.2578	0.2477	1.515	4.589
Asset maturity	Family firm	10.0826	15.4640	72.7566	63.6061	7.7689	0.771	8.654*
	Non-family firms	42.1524	14.6147	44.1947	24.7911	20.0971	0.936	5.663
	All	33.6427	14.8474	51.6864	35.4190	16.8771	1.168	9.142*
Liquidity	Family firm	4.5159	2.9605	3.9422	2.2356	2.0322	0.711	0.728
	Non-family firms	5.3766	4.1425	6.1996	4.5923	5.1432	0.645	4.489
	All	5.1619	3.8441	5.6266	3.9718	4.3329	0.945	3.126

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

5.7 Chapter Summary

Univariate analyses presented in this chapter show that family firms in Australia are more profitable and older than non-family firms. In addition family firms tend to choose lower levels of liquidity and operate in business environments with lower risk. Results are consistent with the view that family firms reduce agency costs, have longer term horizons, and tend to be more risk averse than their non-family counterparts.

The analyses also show that family firms use higher levels of debt, longer term debt maturity, and higher proportions of leasing. Positive association among capital structure variables provide support for the hypotheses developed in Chapter 3. Subsequent chapters examine the impact of family control on capital structure decisions within a multivariate framework.

CHAPTER 6
THE IMPACT OF FAMILY CONTROL ON LEVERAGE

6.1 Introduction

The results of univariate tests discussed in the previous chapter indicate that financing decisions of family controlled firms differ significantly from that of non-family firms. That is, family firms employ higher levels of leverage. However, it is possible that these differences are attributed to other factors such as the company's tax status, firm profitability, firm size, business risk, growth opportunity, asset tangibility and firm age. Therefore, it is necessary to conduct analyses using multiple regressions where the impact of family control on capital structure is examined after controlling for other important factors.

In this chapter various multiple regression techniques are utilised and conducted to examine the hypothesis that family controlled firms in Australia have higher levels of debt (i.e., Hypothesis 1). The objective is to observe whether impact of family control on debt maturity and leasing decisions remains robust after controlling for problems associated with heteroskedasticity, autocorrelation, measurement error, omitted variables bias, outliers and survivorship bias.

The remainder of the chapter is structured as follows. Section 6.2 discusses model estimates using pooled data regression analysis. Section 6.3 presents a sensitivity analysis of the relationship between family control and leverage using alternative estimation techniques. Robustness checks using alternate measures of leverage are

outlined in section 6.4. Sections 6.5 and 6.6, respectively, examine how the impact of family control on leverage differs across industry and firm size.

6.2 Pooled Regression Results

The pooled regression model employed to test whether leverage of family controlled firms differs from that of non-family controlled firms takes the following form:

$$Leverage_{it} = \beta_0 + \beta_1\ Family\ Control_i + \beta_2\ \ Effective\ Tax\ Rate_{it} + \beta_3\ Profitability_{it} + \beta_4\ Firm\ Size_{it} + \beta_5\ Growth\ Opportunity_{it} + \beta_6\ Business\ Risk_{it} + \beta_7\ Asset\ Tangibility_{it} + \beta_8 Firm\ Age_{it} + \beta_9 Industry\ dummies_{it} + \beta_{10}\ Year\ dummies + \varepsilon_{it} \quad (1)$$

The subscripts *i* and *t* represent firm and year respectively. This model is similar to that employed by Anderson and Reeb (2003b). The main proxy for leverage is the proportion of total interest bearing debt to total capital. In section 6.4, three alternative proxies for leverage are examined.

A two-way fixed effects model is used in the regression analysis. The first fixed effect (i.e., a dummy variable that measures years) is included in the model to remove secular effects among the independent variables, while the second fixed effect (i.e., dummy variables that measure industry) is also incorporated to account for variation in debt maturity due to industry differences.

Since panel data were used, standard errors were calculated using the Huber-White Sandwich variance estimator (clustered). This estimator provides robust standard errors in the presence of violations of regression model assumptions (i.e., heteroskedasticity

and serial correlation). The technique is suitable when panel data have a large number of subjects (i.e., firms), but a small number of observations per subject.

Table 6.1 reports four regression models: the first model omits both year and industry dummy variables; model 2 introduces only the year dummy variables; model 3 incorporates only the industry dummy variables; and model 4 includes both year and industry dummy variables. The purpose of presenting four different models is to examine whether the relationship between leverage and family control (and other control variables such as tax position, profitability, size, business risk, growth opportunity, asset tangibility and age) are due to coinciding trends or industry specific factors.

Table 6.1: Pooled Regression Results for Leverage

Variable	Model 1	Model 2	Model 3	Model 4
	(1)	(2)	(3)	(4)
Family control	0.0639***	0.0639***	0.0394**	0.0394**
	(3.67)	(3.66)	(2.24)	(2.24)
Effective tax rate	0.0084***	0.0084***	0.0069**	0.0070**
	(2.77)	(2.74)	(2.48)	(2.45)
Profitability	-0.0339***	-0.0334***	-0.0352***	-0.0347***
	(-2.98)	(-2.89)	(-3.19)	(-3.10)
Firm size	0.0290***	0.0289***	0.0220***	0.0219***
	(8.61)	(8.59)	(6.26)	(6.24)
Growth opportunity	-0.0183***	-0.0184***	-0.0194***	-0.0195***
	(-7.40)	(-7.38)	(-7.69)	(-7.66)
Business risks	-0.0001**	-0.0001**	-0.0001**	-0.0001**
	(-2.01)	(-2.00)	(-2.30)	(-2.29)
Asset tangibility	0.2324***	0.2327***	0.2347***	0.2350***
	(8.82)	(8.81)	(9.21)	(9.20)
Firm Age	-0.0041	-0.0046	-0.0037	-0.0041
	(-0.54)	(-0.59)	(-0.51)	(-0.56)
Industry Dummy	No	No	Yes	Yes
Year Dummy	Yes	Yes	No	Yes
R^2	0.23	0.23	0.28	0.28

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

The coefficient on family control is a key variable of interest. Hypothesis 1 is accepted if the coefficient on family control is positive and statistically significant. That is, a

positive sign for the coefficient on family control indicates that family controlled firms in Australia employ higher levels of debt than their non-family counterparts.

As expected, the coefficient estimates for family control is positive in all four models and significant at the one percent level (for models 1 and 2) and at the five percent level (for models 3 and 4), suggesting that the impact of family control on leverage remains robust even after controlling for industry and coinciding trend effects. In particular, Table 6.1 shows that family firms, on average, use about 20 percent[10] more debt in their capital structure than non-family firms.

Overall, the results provide strong support for Hypothesis 1. That is, Australian family firms use more debt, indicating that the families' desire to use debt as a means of concentrating voting power outweighs the families' desire to use debt as a means of reducing bankruptcy risk.

The positive association between family control and leverage are consistent with Harris and Raviv's (1988) and Stultz's (1988) theory. They argue that debt is used as a device that allows current owners to retain control of their firm. New equity reduces the percentage of the firm's equity capital controlled by the original owners, but debt financing avoids this dilution effect.

Harris and Raviv (1988) and Stulz (1988) suggest that the entrenchment motives cause controlling shareholders to increase leverage in order to inflate the voting power of their equity stakes and to reduce the possibility of takeover attempts. Families are averse to

[10] Following Anderson and Reeb (2003b), this figure was calculated in the following manner: the Family Control coefficient estimate is divided by the average market value of leverage for the entire sample (i.e., 0.04/0.2 = 20%).

takeovers for two reasons: first, takeover leads to a loss of personal benefits derived from being in control; second, it expropriates quasi-rent from family firm-specific human capital. Therefore, families try to insulate themselves from the possibility of takeover by increasing leverage.

Even without the threat of takeover, families still choose debt over equity because equity financing could introduce into the corporation new large shareholders who might threaten the family's dominance. In their seminal study on ownership around the world, LaPorta *et al.* (1999) calculate the probability that controlling family shareholders are single, and find a high probability of families in Australia as single controlling shareholders. These results are also consistent with a recent survey into the financial affairs of U.K. family companies conducted by Poutziouris *et al.* (2002). The survey shows that the most important factor that deters family firms from raising external equity capital is the dilution/loss of ownership and management control.

Interestingly, the impact of family control among Australian firms is similar to that experienced by firms in Thailand (Wiwattanakantang, 1999). Due to weaker investor protection, family firms in Thailand have a stronger desire to consolidate control and therefore use more debt (Claessens and Fan, 2002). Similarly, the above results indicate that Australian family firms use more debt than non-family firms. However, the result is contrary to Claessens and Fan's (2002) property rights argument. They predict that family firms in a country with strong investor protection (such as Australia) should have a weaker desire to control and therefore Australian family controlled firms should employ lower leverage.

The leverage decisions of family firms in Australia are perhaps more consistent with the argument propounded by Bebchuk (1999), who provides a private benefits of control hypothesis. Bebchuk suggests that comparatively large private benefits of control are likely to exist in family controlled firms. With high private benefits of control, family firms are motivated to maintain control and therefore employ more debt to consolidate their voting power.

Table 6.1 shows that most control variables reflect signs in the predicted direction. That is, leverage is negatively related to profitability, growth opportunity and business risk, but positively related to effective tax rate, firm size and asset tangibility. The table also indicates an insignificant impact of firm age on leverage. Overall, the results indicate strong support for the tax, financial distress, and agency explanations, but little support for the information cost hypothesis.

A positive association between effective tax rate and leverage support Twite's (2001) argument and empirical findings. He argues that the value of $1 of equity income distributed via franked dividends and capital gains has a higher value than $1 of debt income due to the taxing of realised capital gains. The effective tax rate determines the level of unfranked dividend. That is, a lower effective tax rate leads to a higher proportion of income available as unfranked dividends. Given that the levels of unfranked dividends determine the preference to equity financing, firms with lower (higher) effective tax rates experience a higher proportion of equity (debt).

Predictions from the agency perspective are generally supported in this study. First, the market to book value ratio (proxy for growth opportunity) is negatively related to leverage. Myers (1977) proposes that companies whose value consists primarily of

investment opportunities are likely to find that debt financing is very costly. Without any restrictions, such companies have more flexibility in their choice of future investments and therefore have a tendency to invest sub-optimally to expropriate wealth from bondholders. This argument suggests that growth opportunity should negatively affect leverage.

Second, the negative association between business risk and leverage provide further support for the agency hypothesis. Bodie and Taggart (1978) argue that firms with higher business risk are expected to have higher agency costs of debt because firms with higher business risk are more likely to face financial distress, an event that exacerbates the underinvestment and asset substitution problem. One way to reduce these conflicts of interest between debtholders and shareholders is by reducing the level of debt.

Third, the positive association between firm size and leverage is also consistent with agency theory. Pettit and Singer (1985) argue that firm size can also be used to proxy the agency problem. That is, smaller firms tend to have a higher proportion of growth opportunities and therefore are more likely to face potential conflicts of interest between shareholders and bondholders such as risk shifting and claim dilution. To reduce the potential agency cost of debt, smaller firms borrow less.

Table 6.1 shows that the greater the proportion of tangible assets (measured as net property, plant and equipment to total assets), the higher the leverage. This result provides support for the financial distress explanation. If a large fraction of a firm's assets are tangible, then assets should serve as collateral. In addition, assets should retain more value in liquidation. As a result, firms with higher proportions of tangible assets can borrow more (Rajan and Zingales, 1995). Further support for the financial

distress explanation comes from the negative coefficient between business risk and leverage. Business risk exacerbates the probability of financial distress. Firms with uncertain operating income have a higher probability of experiencing financial distress, which suggests that the association between business risk and leverage should be negative.

The coefficient on firm size is positive and statistically significant. In addition, firm age seems not to influence decisions related to the level of debt. The directions for these two variables are contrary to predictions of the asymmetric information hypothesis. However, the information cost explanation receives strong support from the impact of profitability on leverage. Consistent with the pecking order theory, profitability is negatively related to leverage. The theory maintains that profitable firms borrow less because these firms have more internal funds available, whereas less profitable firms require external financing and consequently accumulate debt.

6.3 Alternative Estimation Techniques

The regression models in Table 6.1 do not address the possibility that a spurious relationship might exists between family control and leverage because of the lack of inclusion of unmeasured explanatory variables that affect firm behaviour. Omitting these variables results in biased estimates and thus panel data regression techniques were used to deal with this problem (Kennedy, 2003).

Econometricians argue that the impact of unobserved variables on the dependent variable can be accommodated by introducing a different intercept for each subject (i.e., firm). There are two methods of modeling different intercepts for each cross-sectional

unit (Kennedy, 2003). The first method is to model a dummy variable for each firm, which results in a fixed effects estimator. However, fixed effects models have two drawbacks: first, by implicitly including a large number of dummy variables, the degrees of freedom are decreased significantly; second, the estimation process eliminates all explanatory variables that do not vary within each subject.

A second method is to treat different intercepts for each subject randomly, thereby including the intercept as a component of the error term. A random effects estimator is used in this study since fixed effects estimators are unable to deal with time invariant variables (coefficient estimates based on this method are reported in column 1 of Table 6.2).

Thus the second estimation technique considered is the between estimator. The between estimator uses time-series means for each variable by firm. By running the regression model in a single cross-section, the problem of serially correlated errors is eliminated. This regression model preserves the dispersion across firms, but exploits no time-series variation in the observation (Baltagi and Smith, 1995b). Because the between estimator averages the variable's observations, it reduces bias caused by measurement error (Kennedy, 2003). The corresponding results are presented in column 2 of Table 6.2.

A censored (tobit) regression was also employed as there are a significant proportion of leverage observations that take on the values of zero (23%). The regression estimates based on the tobit regression are presented in column 3 of Table 6.2.

Table 6.2 Panel Data Regression for Leverage

Variable	Random Effects	Between Estimator	Tobit (Random Effects)
	(1)	(2)	(3)
Family control	0.0398***	0.0342**	0.0576***
	(2.61)	(2.24)	(3.35)
Effective tax rate	0.0036*	0.0152	0.0037
	(1.66)	(1.21)	(1.39)
Profitability	-0.0355***	-0.0420**	-0.0505***
	(-6.08)	(-2.41)	(-6.23)
Firm size	0.0280***	0.0175***	0.0425***
	(10.42)	(4.60)	(11.22)
Growth opportunity	-0.0102***	-0.0335***	-0.0139***
	(-7.96)	(-7.03)	(-7.86)
Business risks	-0.0001	-0.0001*	-0.0001
	(-0.98)	(-1.71)	(-1.11)
Asset tangibility	0.1397***	0.2665***	0.1868***
	(9.68)	(9.04)	(9.42)
Firm Age	-0.0032	-0.0068	-0.0032
	(-0.46)	(-0.92)	(-0.43)
Industry dummy	Yes	Yes	Yes
Year dummy	Yes	No	Yes
R^2	0.26	0.25	

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

The results resented in section 6.1 are still applicable when panel data regression methods are used to estimate the leverage equation. In particular, the regression coefficients of both family control and other control variables in Table 6.2 do not vary substantially when compared to those reported in Table 6.1. Overall, the positive association between family control and leverage remains robust even when the problem of unobserved variables and restricted distributions of the dependent variable are addressed.

Agrawal and Nagarajan (1990) compare managerial and ownership characteristics of a sample of all equity firms (i.e., firms that do not use long-term debt) and a control sample of levered firms in the U.S. They found that managers of all-equity firms have significantly larger stockholdings than managers of similar-sized levered firms in their industry. More importantly, they also found greater family involvement in all-equity

firms. They maintain that the manager's choice not to use debt is aimed at reducing bankruptcy risk.

Following Agrawal and Nagarajan, this study also examines the probability of family firms using debt. As the dependent variable is a dummy variable; one if firms use interest bearing debt and 0 if firms have no debt, a logistic regression is employed (Table 6.3 reports the logit results). Two estimation methods were used: a pooled logistic regression with a Huber-White Sandwich variance estimator (clustered) and a random effects logistic regression.

Table 6.3 Logistic Regression for Leverage

Variable	Logistic regression (Huber-White)	Logistic regression (Random effects)
	(1)	(2)
Family control	0.5803**	1.0241***
	(2.55)	(2.98)
Effective tax rate	0.0801	0.0176
	(1.14)	(0.18)
Profitability	-0.1050	-0.3054**
	(-1.01)	(-1.95)
Firm size	0.5235***	1.0425***
	(9.38)	(11.40)
Growth opportunity	-0.0029	0.0337
	(-0.10)	(0.97)
Business risks	-0.0004**	-0.0010
	(-2.14)	(-1.16)
Asset tangibility	2.3610***	3.4553***
	(6.10)	(7.50)
Firm Age	0.0701	0.2381
	(0.61)	(1.19)
Industry Dummy	Yes	Yes
Year Dummy	Yes	Yes

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Table 6.3 reports that the coefficients of family control are both positive and statistically significant. The results show that family firms are more likely to use debt than non-family controlled firms. The results are contrary to Agrawal and Nagarajan's findings,

who report a negative association between family control and the likelihood of using debt. However, the results support the findings presented in section 6.1, that is, family firms in Australia use higher levels of leverage to protect their high private benefits of control and firm-specific human capital.

6.4 Alternate Measures of Leverage

The proxy for leverage used in section 6.1 is the ratio of long-term debt to total capital. In this section, three alternative measures of debt maturity are examined for robustness. First, total assets (instead of total capital) is used as a deflator of the dependent variable. Second, leverage is measured as total liabilities to total capital and third, as total liabilities to total assets. Huang and Song (2002) argue that liabilities are a steady part of the company's assets and are used extensively as a means of financing, and therefore can be used to measure leverage.

The regression estimates for each alternative measure of leverage (i.e., total debt to total assets, total liabilities to total capital and total liabilities to total assets) are presented in Panels A, B and C of Table 6.4 respectively. For each alternative measure of leverage, four regression techniques are reported: a pooled regression model in which standard errors are adjusted using the Huber White Sandwich Estimator (clustered) for variances (column 1); the random effects estimator model (column 2); the between estimator model (column 3), and; the censored (tobit) regression model (column 4).

Table 6.4 Regression Estimates for Alternative Measures of Leverage

Panel A: Total interest bearing debt / total assets

Variable	Pooled Regression (Huber-White)	Random Effects	Between Estimator	Tobit (Random Effects)
	(1)	(2)	(3)	(4)
Family control	0.0448*	0.0484**	0.0455**	0.0921***
	(1.78)	(2.12)	(1.97)	(3.61)
Effective tax rate	0.0007	0.0006	-0.0023	0.0001
	(-0.61)	(0.16)	(-0.12)	(0.03)
Profitability	-0.0940**	-0.1018***	-0.0300	-0.1130***
	(-2.35)	(-8.63)	(-1.12)	(-8.84)
Firm size	0.0232***	0.0216***	0.0198***	0.0436***
	(4.25)	(4.88)	(3.45)	(9.08)
Growth opportunity	0.0232*	0.0214***	0.0279***	-0.0156***
	(1.86)	(8.66)	(3.87)	(6.04)
Business risks	-0.0001	0.0001	-0.0001	-0.0001
	(-1.37)	(0.11)	(-0.65)	(-0.17)
Asset tangibility	0.2386***	0.1656***	0.2593***	0.2267***
	(5.46)	(6.29)	(5.82)	(8.47)
Firm Age	-0.0036	-0.0044	-0.0091	-0.0089
	(-0.40)	(-0.41)	(-0.81)	(-0.78)
Industry dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	No	Yes
R^2	0.10	0.10	0.07	

Panel B: Total liabilities / total capital

Variable	Pooled Regression (Huber-White)	Random Effects	Between Estimator	Tobit (Random Effects)
	(1)	(2)	(3)	(4)
Family control	0.0484***	0.0494***	0.0432***	0.0645***
	(2.65)	(3.11)	(2.73)	(4.55)
Effective tax rate	0.0110***	0.0061***	0.0248*	0.0059***
	(4.88)	(2.73)	(1.89)	(2.63)
Profitability	-0.0461***	-0.0535***	-0.0446**	-0.0522***
	(-3.67)	(-8.85)	(-2.46)	(-8.96)
Firm size	0.0253***	0.0305***	0.0192***	0.0282***
	(6.96)	(10.92)	(4.88)	(12.02)
Growth opportunity	-0.0343***	-0.0220***	-0.0534***	-0.0216***
	(-9.27)	(-16.58)	(-10.80)	(-17.46)
Business risks	-0.0001**	-0.0001	-0.0001	-0.0001
	(-2.05)	(-0.72)	(-1.49)	(-0.59)
Asset tangibility	0.2293***	0.1395***	0.2523***	0.1361***
	(8.85)	(9.33)	(8.25)	(9.52)
Firm Age	0.0083	0.0121*	0.0048	0.0068
	(1.05)	(1.65)	(0.62)	(0.98)
Industry dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	No	Yes
R^2	0.36	0.35	0.31	

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel C: Total liabilities / total assets

Variable	Pooled Regression (Huber-White)	Random Effects	Between Estimator	Tobit (Random Effects)
	(1)	(2)	(3)	(4)
Family control	0.1138**	0.1109***	0.1020***	0.1355***
	(2.29)	(3.08)	(2.80)	(3.52)
Effective tax rate	0.0108***	0.0089	0.0152	0.0085
	(2.81)	(1.05)	(0.51)	(0.96)
Profitability	-0.3214**	-0.3469***	-0.1172***	-0.3455***
	(-2.63)	(-15.98)	(-2.81)	(-15.30)
Firm size	0.0308***	0.0196***	0.0208**	0.0096
	(2.53)	(2.63)	(2.29)	(1.19)
Growth opportunity	0.0372**	0.0359***	0.0461***	0.0402***
	(2.43)	(7.44)	(4.06)	(8.04)
Business risks	0.0001	0.0001	-0.0001	0.0001
	(0.70)	(0.75)	(-0.01)	(0.91)
Asset tangibility	0.3681***	0.3543***	0.3292***	0.3731***
	(4.25)	(7.38)	(4.68)	(7.41)
Firm Age	0.0208	0.0267	0.0056	0.0377*
	(1.36)	(1.53)	(0.32)	(2.01)
Industry dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	No	Yes
R^2	0.14	0.14	0.06	

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

The results presented in Table 6.4 are quantitatively and qualitatively similar to the results reported in Table 6.1. Regardless of which leverage proxy and estimation technique was used, the family control coefficient estimates are consistently positive and statistically significant, providing strong support for Hypothesis 1.

6.5 Leverage of Mining and Industrials Firms

Bebchuk (1999) argues that some industries have larger private benefits than other industries and that these private benefits increase the shareholder's desire to maintain control. Lamba and Stapledon (2001) point out that the mining industry has higher private benefits of control compared to firms in the industrials sectors. They argue that the inherent nature of mining operations provide relatively more opportunities for controlling shareholders to engage in self-dealing transactions and to take up corporate business opportunities. These arguments suggest that family firms in the mining

industry use debt as a means of consolidating voting power more extensively, compared with family firms in non-mining industries.

To test this hypothesis, the entire sample is divided into two groups: Mining and Industrials. Then equation 1 is re-estimated for each group. The Mining sector includes ASX industry codes designated 1 to 4, whereas the Industrials sector includes ASX industry codes designated 5 to 23. The distribution of firms in each sector is presented in Table 5.1. There are 331 firms operating in the mining sector compared to 525 firms classified as industrials. Table 6.5 shows results for the determinants of leverage between the mining and the industrials sectors.

Table 6.5: Impact of Family Control on Leverage by Industry

Variable	Pooled Regression (Huber-White)		Random Effects		Between Estimator	
	Mining	Industrial	Mining	Industrial	Mining	Industrial
	(1)	(2)	(3)	(4)	(5)	(6)
Family control	0.0576**	0.0294	0.0609***	0.0330*	0.0638***	0.0192
	(2.06)	(1.44)	(2.72)	(1.70)	(2.83)	(0.98)
Effective tax rate	0.0011	0.0087**	-0.0027	0.0067**	0.0088	0.0108
	(0.36)	(2.36)	(-0.77)	(2.45)	(0.54)	(0.64)
Profitability	-0.0323***	-0.0347	-0.0282***	-0.0446***	-0.0405**	-0.0425
	(-3.64)	(-1.40)	(-4.03)	(-4.81)	(-2.19)	(-1.13)
Firm size	0.0431***	0.0142***	0.0416***	0.0219***	0.0477***	0.0099*
	(8.80)	(3.10)	(11.78)	(5.92)	(8.65)	(1.86)
Growth opportunity	-0.0019	-0.0294***	-0.0037**	-0.0136***	0.0027	-0.0519***
	(-1.05)	(-7.14)	(-2.03)	(-7.71)	(0.48)	(-7.72)
Business risks	-0.0001**	-0.0001*	-0.0001**	-0.0001	-0.0002**	-0.0001
	(-2.96)	(-1.82)	(-2.31)	(-0.23)	(-3.90)	(-0.67)
Asset tangibility	0.1457***	0.2606***	0.0993***	0.1721***	0.1614***	0.2783***
	(4.27)	(7.32)	(5.51)	(7.68)	(4.23)	(6.77)
Firm Age	0.0017	-0.0072	0.0040	-0.0073	0.0053	-0.0131
	(0.21)	(-0.69)	(0.47)	(-0.75)	(0.58)	(-1.27)
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	No	No
R^2	0.32	0.18	0.32	0.16	0.14	0.15

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

As expected, the coefficient estimates for family controlled firms in the mining sector are generally higher than that experienced by family controlled firms in the industrials

sectors. These results are consistent across the different estimation techniques. Interestingly, the coefficient estimates for family controlled firms in the industrials sectors are only marginally significant when the random effects model is used. Nevertheless, the results provide support to Bebchuk's (1999) private benefits of control hypothesis, that is controlling families in the mining sector have a stronger incentive to concentrate voting power and thus use more debt. The results are similar when the analyses are repeated using the book value of leverage. These results also provide further support for the hypothesis that private benefits of control are an important determinant in the level of debt choice.

6.6 Leverage of Small and Large Firms

Families have disproportionate amounts of their wealth invested in the firm, in the form of financial and firm-specific human capital and are therefore relatively undiversified. As debt increases the probability of bankruptcy, families are unwilling to increase debt levels to their optimum level and might even seek to reduce debt levels in order to reduce the probability of bankruptcy. Hence whilst company size is small, the relationship between family control and debt levels should be positive. However, above a certain size, the relationship should become negative due to increased risk aversion. If this proposition is correct, the effect of family control on leverage will differ between large and small firms. In particular, it is predicted that lower coefficient estimates for large family controlled firms will be found, due to an increase in the risk of the families' investment.

To capture this size effect, the sample was divided into two groups: larger firms, which comprised the top 25 percent firms in terms of their market capitalisation and smaller

firms, which comprised the remainder of the sample. Market value of leverage (i.e., total debt / total capital) is used as the dependent variable. Table 6.5 compares the determinants of leverage between larger and smaller companies.

Table 6.6: Impact of Family Control on Leverage by Size

Variable	Pooled Regression (Huber-White)		Random Effects		Between Estimator	
	Small	Large	Small	Large	Small	Large
	(1)	(2)	(3)	(4)	(5)	(6)
Family control	0.0518**	0.0109	0.0535**	0.0104	0.0423**	0.0217
	(2.46)	(0.41)	(2.93)	(0.41)	(2.29)	(0.84)
Effective tax rate	0.0075**	0.0058**	0.0023	0.0017	0.0097	0.0148
	(2.00)	(2.24)	(0.93)	(0.41)	(1.00)	(0.97)
Profitability	-0.0317***	-0.3663***	-0.0289***	-0.2379***	-0.0371*	-0.3617***
	(-2.89)	(-4.71)	(-4.90)	(-5.38)	(-1.97)	(-3.26)
Firm size	0.0339***	0.0029	0.0291***	0.0133**	0.0335***	0.0073
	(4.73)	(0.46)	(6.61)	(2.12)	(3.47)	(0.93)
Growth opportunity	-0.0121***	-0.0577***	-0.0069***	-0.0483***	-0.0236***	-0.0719***
	(-5.85)	(-3.21)	(-5.47)	(-9.17)	(-4.47)	(-6.34)
Business risks	-0.0029*	-0.0001	-0.0010	-0.0001	-0.0033	-0.0001
	(1.74)	(-0.78)	(-0.81)	(-0.69)	(-1.34)	(-0.17)
Asset tangibility	0.2074***	0.1971***	0.1348***	0.0806***	0.2305***	0.2420***
	(6.69)	(4.43)	(8.24)	(2.77)	(6.23)	(5.34)
Firm Age	-0.0015	-0.0044	0.0014	-0.0051	-0.0072	-0.0038
	(-0.18)	(-0.37)	(0.16)	(-0.48)	(-0.74)	(-0.34)
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	No	No
R^2	0.26	0.19	0.25	0.17	0.24	0.14

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Table 6.6 shows that the direction and significance of the coefficients for the control variables are similar for both groups and for the entire sample. The coefficients for larger family controlled firms are all positive across the different estimation techniques. However, the coefficients are not statistically significant, indicating that larger family and non-family firms have similar debt ratios. These results are consistent with those reported by Anderson and Reeb (2003b), who studied the S&P 500 industrial firms in the U.S. They found that family firms use similar levels of debt relative to non-family firms.

In contrast, the coefficients for smaller family controlled firms are all positive and statistically significant at the 5 percent levels. The results suggest that smaller family firms use relatively more debt in their capital structure compared to their non-family counterparts. This evidence is consistent with the view that smaller family firms have a weaker incentive to use debt as a means of reducing firm risk, but have a stronger motivation to use debt as a means of consolidating voting power.

The above analysis uses the top 25 percent percentile as a cut off point to delineate larger and smaller firms. The choice of 25 percent cut off point is rather arbitrary. To ensure robustness of the results, the analyses are repeated using the 30 percent, 40 percent and 50 percent cut off points. The sensitivity analysis shows that the coefficients for larger family controlled firms are consistently lower than those for smaller firms and therefore do not affect the conclusions previously drawn. Also, the results are similar when repeated using the book value of leverage.

Overall, the size effect analyses indicate that the families' strong desire to use debt as a means of concentrating control is especially pertinent for smaller firms. When companies become larger, the families' desire to use debt as a means of reducing bankruptcy risk becomes stronger because financial and human capital at stake increases significantly.

6.7 Additional Robustness Tests

The analyses in previous sections indicate that regression estimation results are robust to alternative measures of leverage and alternative estimation techniques. In this section, several additional sensitivity analyses similar to those reported by Anderson and Reeb

(2003b) are conducted. Specifically, equation 1 was re-estimated using different alternative dependent and independent variables. The impact of influential observations and survivorship bias were also addressed. In general, robustness analyses suggest that the results reported above are insensitive to various alternative specifications.

First, alternative proxies for explanatory variables were used. For example, total revenue or total market capitalisation were used as a measure of firm size or as a denominator of the non-debt tax shield and the profitability variables. In general, the results did not change materially.

Second, two digit ASX Industry Classifications were used (instead of mining versus industrials) to control for industry differences. Although the number of observations in some two digit ASX Industry Classifications such as diversified resources, infrastructure and utilities, alcohol and tobacco, chemicals, paper and packaging, and transport are relatively small, similar results to those reported in Table 6.1 are found.

Third, the probability of survivorship bias was examined by estimating a regression model using a subset of firms that are listed as active on the Australian Stock Exchange during the period of analysis (i.e., delisted firms were excluded). The results are consistent with the analysis when delisted firms were included in the estimation.

Finally, sensitivity of the results in the presence of outliers and influential observations were examined by truncating the largest one to five percent levels for each tail of the distribution for the model variables. The results are generally consistent with the earlier analyses.

6.8 Chapter Summary

The combination of undiversified family holdings and comparatively large private benefits of control suggest that family shareholders are more likely to have a stronger incentive to reduce bankruptcy risk while maintaining control. These unique incentives have opposing effects on leverage decisions. On the one hand, the desire to concentrate voting power motivates families to use more debt. On the other hand, the desire to reduce bankruptcy risk motivates families to use less debt.

The evidence provided in this chapter shows that family controlled firms in Australia have higher levels of leverage than their non-family counterparts, suggesting that the families' incentive to use debt as a means of concentrating their voting power outweighs their incentive to use debt as a means of reducing bankruptcy risk. The result is consistent with the view that comparatively large firm-specific human capital and private benefits of control are likely to exist in family controlled firms. Further analyses show that the desire to use debt to concentrate voting power is stronger for smaller family firms and family firms operate in the mining sector.

CHAPTER 7
IMPACT OF FAMILY CONTROL ON DEBT STRUCTURE

7.1 Introduction

The previous chapter (Chapter 6) examined the impact of family control on leverage. This chapter demonstrates that the family's incentive to protect private benefits of control and firm-specific human capital dictate the choice of debt over equity. However, debt can take a number of forms. It can be secured or unsecured (i.e., debt priority structure), short-term or long-term (i.e., debt maturity structure), privately placed or held by widely-dispersed public investors (i.e., debt mix), and so on. Due to Australian data availability constraints, this study focuses on two debt structure decisions: debt maturity and leasing decisions (which represent priority structure of debt).

Results from the empirical testing of Hypotheses 2 and 3 are discussed and the chapter is divided into the following two main sections: the first section (Section 7.2.) reports results of the relationship between family control and debt maturity (i.e., Hypothesis 2) while the second section (Section 7.3) discusses the association between family control and leasing (i.e., Hypothesis 3).

7.2 Impact of Family Control on Debt Maturity

7.2.1 Pooled Regression Results

Hypothesis 2 proposed in section 3.4 states that *family controlled firms will utilise longer debt maturity more than non-family controlled firms*. The regression equation to test this hypothesis takes the form:

$$\begin{aligned} Debt\ Maturity_{it} = {} & \beta_0 + \beta_1\ Family\ Control_i + \beta_2\ Term\ Structure\ of \\ & Interest_{it} + \beta_3\ Growth\ Opportunity_{it} + \beta_4\ Firm\ Size_{it} + \beta_5\ Asset \\ & Maturity_{it} + \beta_6\ Firm\ Age_{it} + \beta_7\ Business\ Risk_{it} + \beta_8\ Industry\ Dummy_{it} \\ & + \beta_9\ Year\ Dummies + \varepsilon_{it} \end{aligned} \quad (2)$$

The proxy for debt maturity used in this section is the proportion of long-term debt to total debt. This measure has been used by Titman and Wessel (1988). In section 7.2.3, three alternative proxies for debt maturity are also examined.

The procedures used to test the association between family control and debt maturity are generally similar to those used in the case of leverage. That is, a two-way fixed effects (i.e., industry and year fixed effects) model is used in the regression analysis. In addition, the Huber-White Sandwich variance estimator (clustered) are used to provide robust standard errors in the presence of heteroskedasticity and serial correlation

Table 7.1 reports four regression models: the first model omits both year and industry dummy variables; model 2 introduces only the year dummy variables; model 3 incorporates only the industry dummy variables; and model 4 includes both year and industry dummy variables. The purpose of presenting four different models is to

examine whether the relationship between debt maturity and family control are due to coinciding trends or industry-specific factors.

Table 7.1 Pooled Regression Estimates of Debt Maturity Model

Variable	Model 1	Model 2	Model 3	Model 4
	(1)	(2)	(3)	(4)
Family control	0.0419***	0.0419***	0.0293**	0.0293**
	(3.46)	(3.46)	(2.32)	(2.32)
Term structure of interest	0.0007	0.0042	0.0006	0.0043
	(0.28)	(0.88)	(0.26)	(0.91)
Growth opportunity	-0.0051***	-0.0051***	-0.0057***	-0.0057***
	(-3.42)	(-3.42)	(-3.81)	(-3.81)
Firm size	0.0257***	0.0256***	0.0220***	0.0219***
	(10.38)	(10.35)	(8.32)	(8.29)
Asset maturity	0.1997***	0.1997***	0.2008***	0.2008***
	(10.67)	(10.65)	(10.98)	(10.96)
Age	-0.0027	-0.0026	-0.0025	-0.0024
	(-0.50)	(-0.47)	(-0.47)	(-0.44)
Business risk	-0.0001**	-0.0001**	-0.0001**	-0.0001**
	(-2.07)	(-2.08)	(-2.26)	(-2.27)
Industry Dummy	No	No	Yes	Yes
Year Dummy	No	Yes	No	Yes
R^2	0.28	0.28	0.30	0.30

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

The primary variable of interest in this study is β_1 (family control), which indicates whether differences in debt maturity decisions exist between family and non-family firms. A positive coefficient estimate indicates that family firms tend to choose longer debt maturity than non-family firms. As expected, the coefficient estimates for family control is positive in all four models and significant at the one percent level (for models 1 and 2) and at the five percent level (for models 3 and 4), suggesting that the impact of family control on debt maturity remains robust even after controlling for industry and coinciding trend effects. Overall, the results provide strong support for Hypothesis 2 and are consistent with Diamond's (1991) liquidity risk theory.

Diamond (1991) incorporates liquidity risk into a model of debt maturity choice and finds that there is a tradeoff when firm owners/managers make such a decision. He argues that although short-term debt is used by firms to avoid locking in their financing costs with long-term debt (i.e., short-term debt allows for a reduction in borrowing costs when a firm receives good news and the debt is refinanced), it also provides liquidity risk. In other words, a firm's failure to obtain refinancing could force it to liquidate despite the fact that continuation of the firm is the optimal strategy. This sub-optimal liquidation represents the cost of short-term debt.

Even if this extreme outcome (i.e., liquidation) is not realised, short-term debt can still result in a loss of project rents if such debt requires refinancing at an overly high interest rate (Titman, 1992; Froot *et al.*, 1993). Firms might experience significant indirect costs (e.g. loss of customers and distraction of management) due to financial distress when they lose access to attractively priced credit (Guedes and Opler, 1996).Thus the refinancing risk of short-term debt can motivate firms to lengthen the maturity of their debt.

Finnerty and Emery (2001) argue that the firm's attitude towards risk affects its philosophy about financing policy, including the choice between short-term versus long-term debt. Firms whose shareholders are not well diversified, as is often the case with family-controlled companies, frequently choose a relatively higher proportion of long–term debt financing. By doing so, family firms minimise the risk of refinancing short-term debt and avoid inefficient liquidation, an event that adversely affects the families' financial capital, human capital, and private benefits of control.

Results for the control variables in the regression models are generally consistent with theory and findings in earlier research. The term structure of interest rate variable is not significantly different from zero. This is consistent with Peirson *et al.*'s (2002) argument that any tax advantage gained from the choice of debt maturity must be insignificant under the Australian imputation tax system. Since company tax is only a withholding tax from the viewpoint of resident shareholders under the Australian imputation tax system, any tax advantage gained by deferring the company's tax payments (as in the case of debt maturity choice) have no impact on firm value.

The agency cost explanation received strong support from the regression results reported in Table 7.1. First, firms with stronger growth opportunities, as measured by the market-to-book ratio, tend to issue debt of shorter maturity. The coefficient estimates on the market-to-book ratio are negative and statistically significant in all four models, which is consistent with Myers's (1977) argument that growing firms can solve the underinvestment problem by issuing debt that expires before growth options are to be exercised (i.e., short-term debt). This is also consistent with Barclay and Smith's (1995a) and Guedes and Opler's (1996) empirical studies, who similarly find a negative association between debt maturity and growth opportunity.

Second, business risk is negatively related to debt maturity. Bodie and Taggart (1978) argue that firms with higher business risk are expected to experience higher agency costs of debt. In other words, firms with higher business risk are more likely to face financial distress, an event that exacerbates the underinvestment problem. If firms make profitable future investments, only part of the net benefit will be captured by shareholders, while the rest will accrue to bondholders. Since shareholders are unable to reap the full benefits of additional investment, they will invest less than would

otherwise be optimal. Since short-term debt can be used to reduce these problems, the agency cost perspective suggests that borrowers in riskier businesses have an incentive to lower agency costs by shortening debt maturity.

Third, the association between firm size and debt maturity is positive and statistically significant in all cases. Again, this is consistent with the agency cost explanation which argues that smaller firms tend to have higher proportions of growth opportunities (Pettit and Singer, 1985) and therefore are more likely to face a potential conflict of interest between shareholders and bondholders such as risk shifting and claim dilution. In order to curtail these problems, smaller firms use shorter-term debt (Barnea *et al.*, 1980). In addition, Whited (1992) speculates that smaller firms are generally precluded from accessing long-term debt markets since the proportion of their collateralisable assets to future investment opportunities are relatively small. This suggests that a positive association exists between firm size and debt maturity (see Guedes and Opler, 1996; Scherr and Hulburt, 2001).

Similar to previous studies (e.g., Stohs and Mauer, 1996; Guedes and Oppler, 1996; Scherr and Hulburt, 2001), the regression results provide strong support for the maturity-matching hypothesis. The coefficient estimates on asset maturity are significantly positive in all four models, suggesting that firms with longer-lived assets use longer-maturing debt. Myers (1977) argues maturity matching ensures that debt repayments are scheduled to correspond with a decline in the value of assets that are in place. In addition, Stohs and Mauer (1996) explain that when the maturity of debt is shorter than that of assets financed by debt, firms may not have sufficient cash to pay their debt obligations when they are due. On the other hand, if debt has a longer

maturity than assets, cash flows from assets stop while firms have remaining debt obligations to meet.

There is little support for the signaling explanation of debt maturity choice. Due to informational effects, older firms will have longer debt maturity. That is, older firms produce more information about themselves and thus have lower levels of information asymmetry (Sharpe and Nguyen, 1995). Therefore, the expected sign of the age variable is positive, but coefficient estimates indicate a negative, though insignificant, result. Nonetheless, a positive association between firm size and debt maturity is consistent with the asymmetric information prediction.

7.2.2 Alternative Estimation Techniques

Similar to the techniques employed in the analysis of leverage in Chapter 6, three alternative regression models are considered: the random effects model (column 1); the between estimator model (column 2), and; the censored (tobit) regression model (column 3).

The results presented in section 7.1 are still applicable when panel data regression methods are used to estimate the debt maturity equation. In particular, the regression coefficients of both family control and other control variables reported in Table 7.2 do not vary substantially when compared to those reported in Table 7.1. Overall, the positive association between family control and debt maturity remains robust even after addressing the problem of unobserved variables and restricted distributions of the dependent variable.

Table 7.2 Panel Data Regression Estimates of Debt Maturity Model

Variable	Random Effect	Between Estimator	Tobit (Random Effect)
	(1)	(2)	(3)
Family control	0.0268**	0.0258**	0.0330**
	(2.44)	(2.34)	(2.16)
Term structure of interest	0.0023	0.0067	0.0033
	(0.46)	(0.12)	(0.44)
Growth opportunity	-0.0035***	-0.0095***	-0.0120***
	(-3.77)	(-3.02)	(-6.46)
Firm size	0.0214***	0.0206***	0.0413***
	(11.17)	(7.96)	(16.57)
Asset maturity	0.1343***	0.2352***	0.2164***
	(11.85)	(11.07)	(12.63)
Age	0.0020	-0.0061	-0.0068
	(0.40)	(-1.13)	(-0.95)
Business risk	-0.0001	-0.0001**	-0.0001*
	(-1.27)	(-2.42)	(-1.70)
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R^2	0.29	0.28	

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

7.2.3 Alternative Measures of Debt Maturity

The proxy measure for debt maturity used in section 7.2 is the ratio of long-term debt to total capital. In this section, three alternative measures of debt maturity are examined for robustness. First, total assets (instead of total capital) is used as a deflator of the dependent variable. Second, the duration of debt is proxied using the ratio of long-term debt to total debt. Scherr and Hulburt (2001) and Barclay and Smith (1995a)[11] used this measure in their capital structure research in the US. Third, debt maturity is measured using the proportion of long-term liabilities to total liabilities. Liabilities are routinely

[11] Barclay and Smith (1995a) use three-year maturity by dividing long-term debt into short-term debt. This criterion cannot be used in the Australian context because of limited disclosure requirements governing debt-maturity.

used by firms to finance investment in production and therefore, they can be viewed as a source of finance (Stohs and Mauer, 1996)[12].

The regression estimates for each alternative measure of debt maturity (i.e., long-term debt to total assets, long-term debt to total debt, and long-term liabilities to total liabilities) are presented in Panels A, B and C of Table 7.3 respectively.

For each alternative measure of debt maturity, four regression techniques are reported: a pooled regression model in which standard errors are adjusted using the Huber White Sandwich Estimator (clustered) for variances (column 1); the random effects estimator model (column 2); the between estimator model (column 3), and; the censored (tobit) regression model (column 4).

[12] Stohs and Mauer (1996) also developed a debt maturity structure measure by computing the book value-weighted average maturity of debt, debt-like obligations outstanding and current liabilities. In order to calculate this measure, detailed information regarding the type and maturity of each debt instrument outstanding in a firm's fiscal year-end is required. However, given limited disclosure requirements of liabilities in Australian financial statements, Stohs and Mauer's (1996) weighted-average debt maturity method was not possible to compute.

Table 7.3 Regression Estimates of Alternative Measures of Debt Maturity

Panel A: Total Long-term Debt to Total Assets

Variable	Pooled Regression (Huber-White)	Random Effects	Between Estimator	Tobit (Random Effect)
	(1)	(2)	(3)	(4)
Family control	0.0378*	0.0376**	0.0414**	0.1074***
	(1.66)	(1.93)	(2.10)	(4.96)
Term structure of interest	0.0095	0.0101	-0.0302	0.0132
	(1.24)	(0.95)	(-0.30)	(1.22)
Growth opportunity	0.0217*	0.0167***	0.0279***	0.0104***
	(1.78)	(8.80)	(4.96)	(4.87)
Firm size	0.0192***	0.0137***	0.0222***	0.0413**
	(3.16)	(3.86)	(4.79)	(10.04)
Asset maturity	0.1851***	0.1540***	0.2082***	0.2382***
	(6.13)	(6.96)	(5.48)	(10.19)
Age	-0.0025	0.0003	-0.0066	-0.0073
	(-0.33)	(0.04)	(-0.68)	(-0.78)
Business risk	-0.0001	-0.0001	-0.0001	-0.0001
	(-1.25)	(-0.14)	(-0.89)	(-0.76)
Industry Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
R^2	0.09	0.09	0.07	

Panel B: Total Long-term Debt to Total Debt

Variable	Pooled Regression (Huber-White)	Random Effects	Between Estimator	Tobit (Random Effect)
	(1)	(2)	(3)	(4)
Family control	0.0617**	0.0539**	0.0520**	0.0721**
	(2.52)	(2.36)	(2.25)	(2.03)
Term structure of interest	0.0091	0.0095	-0.0833	0.0085
	(0.75)	(0.72)	(-0.70)	(0.44)
Growth opportunity	0.0058	0.0055**	0.0038	0.0016
	(1.65)	(2.38)	(0.57)	(0.40)
Firm size	0.0783***	0.0773***	0.0792***	0.1258***
	(17.20)	(18.25)	(14.53)	(17.97)
Asset maturity	0.3595***	0.2937***	0.4014***	0.4680***
	(10.63)	(11.00)	(9.01)	(11.24)
Age	-0.0128	-0.0072	-0.0184	-0.0215
	(-1.12)	(-0.67)	(-1.63)	(-1.21)
Business risk	-0.0001**	-0.0001**	-0.0001**	-0.0001**
	(-2.24)	(-2.02)	(-2.28)	(-2.19)
Industry Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
R^2	0.33	0.34	0.28	

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel C: Total Long-term Liabilities to Total Liabilities

Variable	Pooled Regression (Huber-White)	Random Effects	Between Estimator	Tobit (Random Effect)
	(1)	(2)	(3)	(4)
Family control	0.0328*	0.0259	0.0302*	0.0350*
	(1.71)	(1.49)	(1.73)	(1.74)
Term structure of interest	0.0029	0.0017	-0.0136	0.0060
	(0.35)	(0.19)	(-0.15)	(0.54)
Growth opportunity	-0.0114***	-0.0082***	-0.0169***	0.0025
	(-3.66)	(-5.09)	(-3.51)	(1.13)
Firm size	0.0485***	0.0410***	0.0499***	0.0780***
	(12.65)	(14.06)	(12.78)	(20.50)
Asset maturity	0.3722***	0.2791***	0.4283***	0.3059***
	(13.70)	(14.76)	(13.10)	(12.84)
Age	-0.0040	0.0045	-0.0130	-0.0111
	(-0.48)	(0.56)	(-1.53)	(-1.06)
Business risk	-0.0001*	-0.0001	-0.0001	-0.0001*
	(-1.68)	(-0.38)	(-1.34)	(-1.69)
Industry Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
R^2	0.30	0.30	0.30	

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Regardless of which debt maturity proxy and estimation technique was used, the family control coefficient estimates are consistently positive and statistically significant, providing further support for Hypothesis 2. In addition, for almost all models the control variables' influence on debt maturity decisions are quantitatively and qualitatively similar to the results reported in Table 7.1.

7.2.4 Firm Credit Quality and Debt Maturity

Diamond (1991) develops a model related to the relationship between firm quality and debt maturity. He argues that although short-term debt can be used by firms to avoid locking their financing costs with long-term debt, it also provides liquidity risk (i.e., risk of the borrower being forced into inefficient liquidation because refinancing is not

available). This tradeoff leads to a non-monotonic relationship between firm quality and the choice of debt maturity.

High credit quality firms face little liquidity risks and therefore prefer to choose shorter term debt to reduce borrowing costs when a firm receives good news or when the debt is refinanced. Low rated borrowers have no choice but to choose shorter-term debt because they have insufficient cash flow to support long-term debt. In contrast, borrowers with intermediate ratings will tend to issue longer term debt because they face higher liquidity risk than higher rated firms. These arguments suggest that firm credit quality is not linearly related to debt maturity.

Johnson (2003) used firm size as a proxy for firm credit quality. That is, he assumes that larger firms have better credit quality. To accommodate the possibility of a non-monotonic association between firm quality and debt maturity, equation 2 (i.e., debt maturity equation) is re-estimated by adding the square of firm size as the independent variable. Diamond's non-linearity theory is supported if firm size is negatively related to debt maturity, whereas the impact of the square of firm size should be positive.

Table 7.4 reports regression results for the debt maturity equation, which includes the square of firm size as the independent variable. Similar to procedures reported in previous sections, three methods are used: a pooled regression with the Huber-White Sandwich variance estimator (clustered), random effects, and between estimators.

Table 7.4 Non-linearity in Debt Maturity Regression Results

Variable	Pooled Regression (Huber-White)	Random Effects	Between Estimator
	(1)	(2)	(3)
Family control	0.0313**	0.0306***	0.0277***
	(2.49)	(2.78)	(2.52)
Term structure of interest	0.0032	0.0032	0.0074
	(0.61)	(0.61)	(0.13)
Growth opportunity	-0.0052***	-0.0052***	-0.0123***
	(-5.24)	(-5.24)	(-3.69)
Firm size	-0.0708***	-0.0708***	-0.0576*
	(-3.87)	(-3.87)	(-1.82)
Firm size squared	0.0026***	0.0026***	0.0021**
	(5.08)	(5.08)	(2.49)
Asset maturity	0.1342***	0.1342***	0.2379***
	(11.88)	(11.88)	(11.21)
Age	-0.0013	-0.0013	-0.0075
	(-0.27)	(-0.27)	(-1.39)
Business risk	-0.0001**	-0.0001***	-0.0001***
	(-2.56)	(2.56)	(-3.28)
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R^2	0.30	0.29	0.28

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

As can be seen from Table 7.4, firm size and the square of firm size have significant negative and positive coefficients respectively. This pattern of coefficients is consistent with Johnson's (2003) findings and supports Diamond's non-linearity argument, that is, low and high credit quality firms borrow short-term while intermediate quality firms borrow long-term.

It should be noted that even after taking into account the non-linear relationship in the debt maturity equation, the impact of family control and other control variables presented in Table 7.4 are similar to the results reported in Table 7.1.

7.2.5 Additional Robustness Checks

The analyses in the previous sections indicate that regression estimation results are robust to alternative measures of debt maturity and alternative estimation techniques. Several additional sensitivity analyses were conducted and are reported in this section.

First, alternative proxies for the explanatory variables are examined. For example, instead of total assets, total revenue or total market capitalisation are used as measures of firm size or as a denominator of the non-debt tax shield and profitability variables. In general, the results do not change materially.

Second, a two digit ASX Industry Classification is used as an alternative means to control for industry differences. Although the number of observations in some two digit ASX Industry Classifications such as diversified resources, infrastructure and utilities, alcohol and tobacco, chemicals, paper and packaging, and transport are relatively small, the results are nevertheless similar to those reported in Table 7.1.

Third, the possibility of survivorship bias is examined by estimating the debt maturity model using a subset of firms that are listed as active on the Australian Stock Exchange during the period of analysis (i.e., delisted firms are excluded). In addition, the sensitivity of regression results in the presence of outliers and influential observations are tested by truncating the largest one to five percent levels for each tail of the distributions for the model variables. Again, the results are generally consistent with earlier analyses.

Overall, the results presented in Section 7.2 provide strong support for Hypothesis 2, that is, family firms tend to choose longer debt maturity to avoid the possibility of inefficient liquidation and refinancing risk of short-term debt.

7.3 Impact of Family Control on Leasing

7.3.1 Pooled Regression Results

Hypothesis 3 proposed in section 3.5 states *that family controlled firms will have a higher proportion of leasing than non-family controlled firms.* The regression equation to test this hypothesis takes the form:

$$Lease\ Share_{it} = \beta_0 + \beta_1\ Family\ Control_i + \beta_2\ Effective\ Tax\ Rate_{it} + \beta_3\ Growth\ Opportunity_{it} + \beta_4\ Firm\ Size_{it} + \beta_5\ Asset\ Tangibility_{it} + \beta_6\ Firm\ Age_{it} + \beta_7\ Liquidity_{it} + \beta_8\ Industry\ Dummy_{it} + \beta_9\ Year\ Dummies + \varepsilon_{it} \quad (3)$$

The proxy for leasing used in this section is the proportion of total lease (i.e., present value of operating lease – using average borrowing rate plus financial lease assets) to total capital. In section 7.3.3, three alternative proxies for leasing are also examined. The procedures used to test the association between family control and leasing are generally similar to those in the case of leverage and debt maturity, and therefore will not be explained here.

Table 7.5 Pooled Regression Estimates of the Lease Share Model

Variable	Model 1	Model 2	Model 3	Model 4
	(1)	(2)	(3)	(4)
Family control	0.0658***	0.0658***	0.0489**	0.0489**
	(2.69)	(2.69)	(2.08)	(2.08)
Effective tax rate	0.0125	0.0124	0.0111	0.0110
	(1.64)	(1.64)	(1.52)	(1.51)
Growth opportunity	-0.0082***	-0.0082***	-0.0077***	-0.0077***
	(-5.94)	(-5.88)	(-5.92)	(-5.87)
Firm size	-0.0055*	-0.0054*	-0.0086***	-0.0086***
	(-1.80)	(-1.77)	(-2.75)	(-2.70)
Asset tangibility	0.1047***	0.1049***	0.1027***	0.1029***
	(3.10)	(3.10)	(3.08)	(3.08)
Age	0.0098	0.0096	0.0093	0.0090
	(1.17)	(1.13)	(1.14)	(1.08)
Liquidity	-0.0004***	-0.0004***	-0.0002***	-0.0002***
	(-5.15)	(-5.16)	(-3.40)	(-3.39)
Industry Dummy	No	No	Yes	Yes
Year Dummy	No	Yes	No	Yes
R^2	0.05	0.05	0.08	0.08

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

The estimated coefficients of family control (β_1) are positive and statistically significant across all four models. The results show that the impact of family control on leasing remains significant even after controlling for industry and coinciding trend effects. The estimates indicate that family controlled firms in Australia use leasing transactions more extensively than their non-family counterparts, thus providing support to Hypothesis 3. The combination of undiversified financial and human capital and the fear of losing control motivates families to use leasing as a means of risk reduction.

This result is consistent with theoretical work by Smith and Wakeman (1985). They show that closely-held shareholders reduce risk by leasing assets so that the lessor bears some of the risk associated with the use of the asset by the lessee. This view is shared by Flath (1980, p. 255) when he states that " .... shifting of risk can be a reason for

leasing. Among lessees, this is the most likely to be so for closely-held firms and least likely to be so for corporations with widely dispersed shareholders".

Leasing can be used by families to reduce risk in several ways (Schallheim, 1994 p. 13-15; Brigham and Gapensi, 1993 p. 661-662). First, family firms can transfer fluctuations in the economic value of the asset to the lessor. The uncertainty in asset values can be attributed to many factors such as unpredictable technological obsolescence, competition of substitutes, and interest rate uncertainty. For example, in a short period some technological obsolescence might make one particular asset almost worthless and this large economic depreciation could make the entire project unprofitable. Asset value risk can be transferred to the lessor who is able to manage the risk better. By purchasing and then leasing many different items, the lessor benefits from diversification (i.e., loss in some items will be offset by other items that retain higher value). In addition, lessors are generally familiar with the market for the assets they offer and therefore they can obtain a better price in the resale market.

Second, leasing facilitates diversification. Smaller family firms can become very concentrated in a limited category of capital equipment. To avoid this concentration, firms lease capital equipment, thus saving funds for owners to invest in the capital market to obtain better investment diversification. Less concentration of wealth in one particular asset also allows firms to quickly respond to changing market conditions.

Finally, leasing offers a hedge against business risk due to its payment schedule flexibility. For example, if lease payments are tied into asset use by way of a metering agreement, it may offer a hedge against business risk. In other words, when asset use is

high, lease payments will be higher; when asset use is low, lease payments will be lower.

The coefficient estimates in Table 7.4 offer some support for the tax and agency arguments but not for the information cost hypothesis. Peirson *et al.* (2002, p.515) argue that under the Australian imputation tax system, shareholders view company income tax as a withholding tax (i.e., the effective rate of company income tax is very low from the shareholders point of view). Accordingly, any advantage by deferring company tax payments, as is often the case with leasing, will be very small. Consistent with this argument, the coefficient estimates on effective tax rates are insignificant for all models.

Contrary to the agency explanation, growth opportunity has a negative impact on leasing decisions. Agency theory predicts that firms with higher proportions of growth opportunities face higher agency costs and thus use more lease financing to lower these costs, suggesting a positive association between growth opportunity and lease financing.

The coefficient estimates on firm size have a negative direction and are statistically significant, which indicates that smaller firm tend to use leasing. This is consistent with the agency explanation provided by Pettit and Singer (1985). They argue that smaller firms tend to have higher proportions of growth opportunities and therefore are more likely to face potential conflict of interest such as risk shifting and claim dilution between shareholders and bondholders. This agency perspective predicts a negative association between leverage and firm size.

The influence of asset tangibility is positive and significant, that is, firms with a higher proportion of property, plant and equipment tend to lease. Graham *et al.* (1998) argue

that the leasing contract, by definition, is tied to a specific fixed asset. Therefore, ceteris paribus, firms that use more fixed assets in the production process should use more leasing.

Drury and Braund (1990) and Beattie *et al.* (2000) argue that poor liquidity and cash flow problems are an important influence on the decision to lease. Lessors generally have the highest priority in bankruptcy situations because a default on a promised lease payment typically gives the lessor the right to repossess the leased asset (Barclay and Smith, 1995b). Therefore, leases have a lower expected bankruptcy cost for the lessor (Krishnan and Moyer, 1994). This unique feature makes leasing a preferred financing alternative for firms with a higher potential for financial distress, as in the case of firms which have liquidity/cash flow problems. In short, for firms experiencing liquidity/cash flow problems, unsecured debt would be too risky and thus lease financing is the only form of finance available to them (Krishnan and Moyer, 1994; Beattie *et al.*, 2000). Consistent with this argument, coefficient estimates on the liquidity ratio are negative and significant (see Adedeji and Stapleton, 1996 and Beattie *et al.*, 2000).

There is little support for the signaling hypothesis. Sharpe and Nguyen (1995) argue firms that face higher costs of external capital are more inclined to lease. Older firms produce more information about themselves and thus have lower levels of information asymmetry. Therefore, it is expected that firm age will be negatively associated with leasing. Contrary to this expectation, the coefficient estimates on age are all positive, though insignificant.

7.3.2 Alternative Estimation Techniques

Similar to the techniques employed in the analysis of debt maturity, three alternative regression models are considered: the random effects model (column 1); the between estimator model (column 2), and; the censored (tobit) regression model (column 3).

Table 7.5 illustrates that the results presented in section 7.3.1 are still applicable when panel data regression methods are used to estimate the leasing equation. In particular, regression coefficients for both family control and other control variables do not vary substantially when compared to those reported in Table 7.4. Thus, the positive association between family control and leasing decisions remain robust even after addressing the problem of unobserved variables and restricted distributions of the dependent variable.

Table 7.6 Panel Data Regression Estimates of the Lease Share Model

Variable	Random Effect	Between Estimator	Tobit
	(1)	(2)	(3)
Family control	0.0415***	0.0436***	0.0572***
	(2.57)	(2.68)	(5.45)
Effective tax rate	0.0024	0.0415***	0.0118***
	(1.05)	(2.94)	(2.81)
Growth opportunity	-0.0031***	-0.0138***	-0.0156***
	(-2.61)	(-3.04)	(-7.06)
Firm size	-0.0157***	-0.0097***	0.0023
	(-6.56)	(-2.77)	(1.09)
Asset tangibility	0.0730***	0.1146***	0.1483***
	(4.89)	(3.68)	(8.50)
Age	0.0134*	0.0032	0.0044
	(1.84)	(0.41)	(0.83)
Liquidity	-0.0001	-0.0002	-0.0008***
	(-1.56)	(-0.72)	(-3.95)
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
R^2	0.08	0.04	

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

7.3.3 Alternative Measures of Leasing

In section 7.3.1 the present value of the future operating lease variable was discounted at the average borrowing rate. An alternative variable is the operating lease payments discounted at the 10 percent rate for all companies. Two types of deflators for this alternative dependent variable are used. In Panel A of Table 7.6, the value of financial lease plus operating lease are expressed as a percentage of total capital, whereas in Panel C it is expressed as a percentage of total assets. In addition, Panel B reports regression estimates where the dependent variable is the ratio of total lease (i.e., financial lease assets plus the present value of operating lease discounted using average borrowing rate) to total assets.

Again, four regression techniques are presented for each alternative measure of total lease: the pooled regression model in which standard errors are adjusted using the Huber White Sandwich Estimator (clustered) for variances (column 1); the random effects model (column 2); the between estimator model (column 3), and; the censored (tobit) regression model (column 4).

Table 7.7 Regression Estimates of Alternative Measures of the Lease Share Model

Panel A: Discount Rate: 10%, Denominator: Total Capital

Variable	Pooled Regression (Huber-White)	Random Effects	Between Estimator	Tobit
	(1)	(2)	(3)	(4)
Family control	0.0466**	0.0392***	0.0402***	0.0546***
	(2.11)	(2.57)	(2.62)	(5.52)
Effective tax rate	0.0102	0.0021	0.0374***	0.0112***
	(1.55)	(1.00)	(-1.82)	(2.83)
Growth opportunity	-0.0076***	-0.0033***	-0.0132***	-0.0155***
	(-6.52)	(-3.10)	(-3.15)	(-7.49)
Firm size	-0.0087***	-0.0153***	-0.0101***	0.0017
	(-2.97)	(-6.86)	(-3.05)	(0.83)
Asset tangibility	0.0984***	0.0693***	0.1129***	0.1411***
	(3.19)	(4.97)	(1.94)	(8.57)
Age	0.0083	0.0123*	0.0033	0.0037
	(1.05)	(1.80)	(0.45)	(0.75)
Liquidity	-0.0002***	-0.0001*	-0.0002	-0.0008***
	(-3.52)	(-1.70)	(-0.75)	(-4.05)
Industry Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
R^2	0.08	0.07	0.03	

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel B: Discount Rate: Average Interest Rate, Denominator: Total Assets

Variable	Pooled Regression (Huber-White)	Random Effects	Between Estimator	Tobit
	(1)	(2)	(3)	(4)
Family control	0.0498**	0.0479***	0.0483***	0.0614***
	(2.15)	(2.97)	(2.94)	(4.68)
Effective tax rate	0.0056	0.0015	0.0212	0.0068
	(1.54)	(0.39)	(1.48)	(1.31)
Growth opportunity	0.0155	0.0188***	0.0097**	0.0128***
	(1.50)	(9.96)	(2.12)	(5.39)
Firm size	-0.0054	-0.0078***	-0.0058*	0.0078***
	(-1.33)	(-2.69)	(-1.65)	(2.93)
Asset tangibility	0.0877***	0.0430**	0.1265***	0.1478***
	(3.60)	(2.04)	(4.02)	(6.70)
Age	0.0127*	0.0124	0.0045	0.0081
	(1.76)	(1.62)	(0.57)	(1.23)
Liquidity	-0.0002***	-0.0002	-0.0001	-0.0009***
	(-2.86)	(-1.15)	(-0.44)	(-3.70)
Industry Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
R^2	0.05	0.05	0.02	

Panel C: Discount Rate: 10%, Denominator: Total Assets

Variable	Pooled Regression (Huber-White)	Random Effects	Between Estimator	Tobit
	(1)	(2)	(3)	(4)
Family control	0.0434**	0.0399***	0.0394***	0.0524***
	(2.17)	(2.84)	(2.77)	(4.95)
Effective tax rate	0.0050	0.0006	0.0210*	0.0062
	(1.55)	(0.21)	(1.74)	(1.49)
Growth opportunity	0.0116	0.0146***	0.0068*	0.0089***
	(1.46)	(10.27)	(1.76)	(4.87)
Firm size	-0.0052	-0.0087***	-0.0058*	0.0053***
	(-1.35)	(-3.58)	(-1.88)	(2.48)
Asset tangibility	0.0844***	0.0454***	0.1140***	0.1336***
	(3.68)	(2.69)	(4.17)	(7.52)
Age	0.0112*	0.0104	0.0047	0.0074
	(1.64)	(1.58)	(0.69)	(1.41)
Liquidity	-0.0002***	-0.0001	-0.0001	-0.0008***
	(-3.03)	(-1.34)	(-0.55)	(-3.90)
Industry Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
R^2	0.06	0.05	0.03	

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

The results presented in Table 7.6 are quantitatively and qualitatively similar to the results reported in Table 7.4. Regardless of which leasing proxy and estimation technique was used, the family control coefficient estimates are consistently positive and statistically significant, providing further support to Hypothesis 3.

7.3.4 Operating Lease versus Financial Lease

In Australia, the relevant accounting standards related to leasing are the *Australian Accounting Standard* AAS17 and *Australian Accounting Standards Board Accounting Standard* AASB 1008, both entitled 'Accounting for Leases'. These standards outline that the accounting treatment of leasing depends on whether it is classified as a financial lease or an operating lease. The classification of a lease depends on the economic substance of the transaction (i.e., transfer of risk and ownership). Provided that substantially all risks and benefits associated with ownership of the leased assets are effectively transferred to the lessee, the lease is then a finance lease and should be recognised as both an asset and a liability. If risks and benefits of ownership are not transferred, the lease is referred to as an operating lease and no liability or asset should be shown in the balance sheet of the lessee.

It is clear from the accounting standards that a critical distinction between operating and financial lease is whether there is a transfer of the assets' risks and benefits. This difference has an important implication for the analysis of the relationship between family control and leasing decisions. Flath (1980) argues that financial leasing is not a "true" lease. In a financial lease transaction, the assets' risks and benefit are transferred to the lessee. When firms buy an asset and finance the purchase with debt, they are also responsible for the assets' risks and benefits. Therefore, there is no real economic

distinction between a financial lease and a secured debt. In contrast, Flath claims that an operating lease is a "true" lease since the lessee does not bear the assets' risks and benefits and consequently, operating leases affect the allocation of risk. Specifically, the use of leasing to avoid personal exposure is far more plausible when the term of the lease contract is considerably less than the asset's useful life (Mehran *et al.*, 1999).

As argued in section 3.4, family controlled firms value risk reduction benefits of leasing more than non-family firms due to the undiversified family's financial and human capital investment. However, previous analyses show that not all types of leasing can be used as a means of risk reduction. Specifically, Flath (1980) argues that only operating leases affect risk allocation. Consequently, it is argued that family controlled firms will use operating leases more extensively than non-family firms. In addition, since financial leases cannot be used as a means of risk reduction, family and non-family firms will be indifferent to financial lease decisions.

To test this hypothesis, the leasing equation is re-estimated using two different dependent variables: operating lease and financial lease. Operating lease is defined as the proportion of the present value of operating lease to total capital, whereas financial lease is calculated as the proportion of finance leased assets to total capital. Three regressions technique are employed: the pooled regression model (the Huber-White Sandwich variance estimator (clustered)); the random effects model, and; the between estimator regression model. Table 7.7 shows regression estimates for both operating and financial lease.

Table 7.8 Regression Estimates - Operating and Financial Lease Share

Variable	Pooled Regression (Huber-White)		Random Effects		Between Estimator	
	Operating Lease	Financial Lease	Operating Lease	Financial Lease	Operating Lease	Financial Lease
	(1)	(2)	(3)	(4)	(5)	(6)
Family control	0.0404*	0.0030	0.0351**	0.0018	0.0376**	0.0011
	(1.86)	(0.81)	(2.39)	(0.41)	(2.55)	(0.24)
Effective tax rate	0.0100	0.0005	0.0029	0.0005	0.0346***	0.0006
	(1.44)	(0.59)	(1.31)	(0.67)	(2.70)	(0.16)
Growth opportunity	-0.0060***	-0.0015***	-0.0025**	-0.0009**	-0.0099**	-0.0030**
	(-4.91)	(-5.23)	(-2.26)	(-2.25)	(-2.40)	(-2.44)
Firm size	-0.0045	-0.0023***	-0.0113***	-0.0025***	-0.0046	-0.0032***
	(-1.54)	(-3.31)	(-5.10)	(-3.47)	(-1.45)	(-3.31)
Asset tangibility	0.0473	0.0353***	0.0273*	0.0261***	0.0531*	0.0456***
	(1.59)	(5.15)	(1.95)	(5.29)	(1.88)	(5.19)
Age	0.0107	0.0014	0.0151**	0.0009	0.0062	-0.0007
	(1.41)	(0.78)	(2.27)	(0.47)	(0.88)	(-0.33)
Liquidity	-0.0001**	-0.0001	-0.0001	0.0001	-0.0002	-0.0001
	(-2.77)	(-0.73)	(-1.01)	(0.18)	(-0.58)	(-0.57)
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.06	0.04	0.05	0.03	0.02	0.02

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

As expected, coefficient estimates for family control regressed on operating lease (columns 1, 3 and 5) are positive and statistically significant. In contrast, those based on the financial lease ratio (columns 2, 4 and 6) are not statistically different from zero. These results are consistent across the different estimation techniques and are similar when the analysis is repeated using the book value of assets as a denominator or when future operating lease is discounted using the average interest rate. The results suggest that family controlled firms in Australia tend to use operating lease (and not financial lease) as a risk reduction strategy.

7.3.5 Additional Robustness Checks

The analyses in the previous sections indicate that regression estimation results are robust to alternative measures of leasing and alternative estimation techniques. Beattie *et al.* (2000) argue that the method of constructive capitalisation used to estimate the value of operating lease involves subjective assumptions and judgement especially related to the discount rate. Therefore, the base assumption of a 10 percent interest rate to discount the estimated future lease payments was varied by ±1percent and ±2percent. In general, the results reported in Table 7.4 do not change materially.

Graham *et al.* (1998) argue that lease payments, like debt, represent a fixed payment obligation. Therefore, they calculated the usage of leases as a fraction of the firm's total debt. Again, this method did not alter the results presented in Table 7.4.

Other types of sensitivity analyses include: (1) using total revenue or total market capitalisation (instead of total assets) to measure firm size or as a denominator of non-debt tax shield and profitability variables; (2) using a two digit ASX Industry Classification as an alternative way to control for industry differences; (3) the possibility of survivorship bias is examined by estimating the debt maturity model using a subset of firms that are listed as active on the Australian Stock Exchange during the period of analysis (i.e., delisted firms are excluded); (4) the sensitivity of regression results in the presence of outliers and influential observations are tested by truncating the largest one to five percent levels for each tail of the distribution for the model variables. The results are generally consistent with earlier analyses.

In summary, the analyses indicate that family controlled firms in Australia use leasing transactions more extensively than their non-family counterparts, thus providing support to Hypothesis 3. The combination of undiversified financial and human capital and the fear of losing control motivates families to use leasing as a means of reducing risk.

7.4 Chapter Summary

This chapter investigates the impact of family control on debt structure decisions. Specifically, two types of debt structure are examined: debt maturity and leasing decisions. The evidence shows that family controlled firms use long-term debt and leasing in their debt structure more often than non-family controlled. The results are insensitive to alternative estimation techniques, alternative measures of debt maturity/leasing, and are robust to concerns of non-spherical disturbances and outliers.

Overall, the evidence is consistent with the argument that family controlled firms use debt structure to reduce the probability of financial distress. Financial distress can be very costly for family shareholders because it adversely affects their financial and human capital. More importantly, financial distress generally leads to a shift in control from family to lenders and therefore, families lose private benefits from controlling their firms. A combination of these factors motivates families to reduce firm risk.

CHAPTER 8
THE IMPACT OF FAMILY CONTROL ON CAPITAL STRUCTURE DECISIONS

8.1 Introduction

This chapter discusses results from the empirical testing of Hypothesis 4. Specifically, various regression models are conducted to test whether the impact of family control on the relationships among capital structure decisions are different from that of non-family firms. Within capital structure research, most studies typically focus on one specific aspect, such as leverage, debt maturity, debt priority, debt mix, debt convertibility or leasing decisions. However, firms may use more than one of these components simultaneously to reduce information, incentive and financial distress problems (Barclay *et al.*, 2003). Therefore, a simultaneous equations approach is adopted in this chapter.

The chapter is organised as follows. Section 8.2 reports results from estimating the relationships among capital structure decisions for the entire sample. In Section 8.3 the sample is divided into two groups and family controlled firms are compared to non-family controlled firms. The main purpose is to examine the impact of ownership structure on the interaction of capital structure decisions.

8.2 Joint Determination of Capital Structure: Entire Samples

Empirical tests for the entire sample were performed in the following order. First, the leverage, debt maturity and leasing equations were estimated separately under the

single-equation's framework using OLS. Second, all equations were jointly estimated within a simultaneous-equations framework using a three stage least square (3SLS) procedure. Third, these two sets of results were compared to ascertain the sensitivity of the findings to the estimation framework. Finally, simultaneous-equations were reestimated using different measures for the dependent variables (i.e., leverage, debt maturity and leasing) as a check on the robustness of the results.

The simultaneous equation systems used in this chapter take the following form:

$$Leverage_{it} = \beta_{10} + \beta_{12}\, \textbf{Debt Maturity}_{it} + \beta_{13}\, \textbf{Lease Share}_{it} + \beta_{14}\ \ Effective\ Tax\ Rate_{it} + \beta_{16}\ \ Profitability_{it} + \beta_{17}\, Growth\ Opportunity_{it} + \beta_{18}\, Firm\ Size_{it} + \beta_{19}\ \ Business\ Risk_{it} + \beta_{110}\, Firm\ Age_{it} + \beta_{111}\, Asset\ Tangibility_{it} + \beta_{115}\ Industry\ dummies_{it} + \beta_{116}\, Year\ dummies + \varepsilon_{it} \qquad 4(a)$$

$$Debt\ Maturity_{it} = \beta_{20} + \beta_{21}\, \textbf{Leverage}_{it} + \beta_{23}\, \textbf{Lease Share}_{it} + \beta_{25}\ \ Term\ Structure\ of\ Interest_{it} + \beta_{27}\, Growth\ Opportunity_{it} + \beta_{28}\ \ Firm\ Size_{it} + \beta_{29}\ Business\ Risk_{it} + \beta_{210}\ \ Firm\ Age_{it} + \beta_{212}\, Asset\ Maturity_{it} + \beta_{215}\, Industry\ Dummy_{it} + \beta_{216}\, Year\ Dummies + \varepsilon_{it} \qquad 4(b)$$

$$Lease\ Share_{it} = \beta_{30} + \beta_{31}\, \textbf{Leverage}_{it} + \beta_{32}\, \textbf{Debt Maturity}_{it} + \beta_{34}\ \ Effective\ Tax\ Rate_{it} + \beta_{37}\ \ Growth\ Opportunity_{it} + \beta_{38}\ \ Firm\ Size_{it} + \beta_{310}\, Firm\ Age_{it} + \beta_{311}\, Asset\ Tangibility_{it} + \beta_{314}\, Liquidity_{it} + \beta_{315}\, Industry\ Dummy_{it} + \beta_{316}\ Year\ Dummies + \varepsilon_{it} \qquad 4(c)$$

The OLS and 3SLS results are reported in Table 8.1. The regression estimates using ordinary least squares are reported in columns 1, 3 and 5 of Table 8.1 (Panel A), while those based on the three stage least square (3SLS) are presented in columns 2, 4 and 6.

Panel B of Table 8.1 presents the goodness of fit of the model[13]. The most fundamental measure of overall fit in structural equation modeling is the Chi-square statistics (Hair *et al.*, 1995). The researcher is looking for nonsignificant statistics because the test is between actual and predicted matrices. As can be seen from Panel B, the model used in this study has a large value of Chi-square (i.e., 221.07) indicating that the observed and estimated coefficient differ considerably. However, the Chi-square statistic is sensitive to sample size differences, especially when the sample size exceeds 200 observations. That is, if the sample size become very large (as in the case of this study), significant values of Chi-square are easily found.

In order to overcome this weakness, other measures of goodness of fit are used: Goodness of Fit Index (GFI), Root Mean Square Error Approximation (RMSEA), Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI), and Tucker-Lewis Index (TLI). A brief explanation of these indices is provided in Panel B of Table 8.1. Except for the Tucker-Lewis Index, all measures are close or better to the recommended level, indicating that the simultaneous equation model used in this study has adequate goodness of fit.

[13] The Stata software was used to conduct the 3SLS analyses. However, Stata does not provide a good range of goodness of fit measures. Thus Stata was used in conjunction with LISREL, which provides richer measures of goodness of fit for simultaneous equation models.

Table 8.1 Regression Results: Full Sample

Panel A: Results

Variable	Leverage		Debt Maturity		Leasing	
	OLS	3SLS	OLS	3SLS	OLS	3SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Leverage	-	-	0.5145***	-0.0339	0.0916***	0.1640***
			(18.88)	(-0.38)	(4.38)	(6.93)
Debt maturity	0.1168***	-1.6124***	-	-	0.0299**	0.3162***
	(11.85)	(-4.66)			(2.35)	(11.79)
Leasing	0.0486***	6.0465***	0.0500**	2.6724***	-	-
	(3.84)	(7.91)	(2.34)	(7.28)		
Effective tax rate	0.0056*	-0.0067	-	-	0.0051	0.0003
	(1.71)	(-0.47)			(1.18)	(0.22)
Growth opportunity	-0.0183***	-0.2165***	-0.0170***	-0.1198***	0.0152***	0.0357***
	(-11.40)	(-7.46)	(-4.65)	(-7.44)	(7.68)	(11.27)
Firm size	0.0093***	0.1803***	0.0832***	0.0972***	-0.0049	-0.0337***
	(4.72)	(6.23)	(27.21)	(13.69)	(-2.05)	(-10.13)
Risk	-0.0001**	0.0001	-0.0001***	-0.0001	-	-
	(-2.13)	(0.15)	(-3.64)	(-0.87)		
Age	-0.0012	-0.1413***	-0.0199***	-0.0656***	0.0132**	0.0244***
	(-0.30)	(-3.53)	(-2.54)	(-3.41)	(2.53)	(3.56)
Profitability	0.0012	-0.0035	-	-	-	-
	(0.92)	(-0.98)				
Liquidity	-	-	-	-	-0.0001	0.0001
					(-0.97)	(0.94)
Asset tangibility	0.1853***	-0.0433	-	-	-	-
	(12.80)	(-0.27)				
Asset uniqueness	-	-	-	-	-0.0431	0.0071
					(-1.59)	(0.59)
Asset maturity	-	-	0.0001	0.0001	-	-
			(1.31)	(1.27)		
Term structure of interest	-	-	0.0044	0.0389	-	-
			(0.22)	(0.83)		
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel B: Goodness of Fit[14]

Measure	Level of Acceptable Fit	Result
Chi-Square	A significant Chi-Square statistic indicates that the observed and estimated matrices differ. Therefore, researcher is looking for non-significant differences as an indication of goodness of fit.	221.07 (p-value: .00)
Goodness of Fit Index (GFI)	The GFI represents the overall degree of fit (i.e., the square residuals from prediction compared with the actual data) but is not adjusted for the degrees of freedom. Higher values indicate better fit. Recommended level: .90	0.99
Root Mean Square Error Approximation (RMSEA)	The squared root of the mean of the squared residuals (an average of the residual between the observed and estimated input matrices). The discrepancy is measured in terms of the population. Values under .08 are deemed acceptable.	0.085
Adjusted Goodness of Fit Index (AGFI)	The AGFI adjust the GFI for the degrees of freedom of a model relative to the number of variables. Recommended level: .90	0.89
Normed Fit Index (NFI)	The NFI is a measure that rescales Chi-Square into a 0 (no fit) to 1 (perfect fit) range. Recommended level: .90	0.97
Tucker-Lewis Index (TLI)	The TLI can be used to compare alternative (or proposed) models against the null model. It is scaled from 0 (no fit) to 1 (perfect fit). Recommended level: .90	0.65

There are several significant differences between the regression estimates based on the OLS and the 3SLS. For example, debt maturity positively affects leverage in the OLS estimate. In contrast, the 3SLS provides a negative association between debt maturity and leverage. There are also several differences among the control variables. For instance, firm age is generally not statistically significant in the OLS regression, whereas it is significant in the 3SLS regression. Similarly, the impact of firm risk becomes insignificant in the 3SLS regression. These differences might be due to the simultaneous-equation bias in the ordinary least square estimation.

The corporate finance literature (e.g., Barclay *et al.*, 2003; Leland and Toft, 1996) indicates that firms use capital structure decisions simultaneously. Therefore, allowing

[14] The definition and recommended acceptance level of goodness of fit are based on Hair *et al.* (1995).

for a restricted form of interdependence among leverage, debt maturity and leasing results in a variety of econometric problems. Parameters estimated from a reduced form equation are unlikely to be efficient. In addition, treating endogeneous variables as exogeneous variables leads to biased and inconsistent parameter estimates. Due to the various conceptual and econometric problems associated with the OLS, a 3SLS procedure was used to estimate results and the primary discussion in this chapter is based on this procedure.

The 3SLS estimates provide evidence of strong support for the agency arguments and some support for the tax and information cost hypotheses. The prediction that effective tax rate positively affects leverage is not found. However, insignificant relationships between the effective tax rate and leasing and between the term structure of interest rate and debt maturity are consistent with the tax explanation. In particular, this reflects the neutral impact that the dividend imputation tax shield has on the choice of debt contracts (Peirson *et al.*, 2002; Bishop *et al.*, 2004). They argue that under the Australian imputation tax system, any tax advantage gained by deferring the company's tax payments, such as tax advantages from debt maturity and leasing finance, will be insignificant because company tax is only a withholding tax from the viewpoint of resident shareholders.

The agency explanation also received strong support within the simultaneous equations system. Myers (1977) argues that firm value consists of future investment opportunities and assets in place. He proposes that companies whose value consists primarily of investment opportunities are likely to find that debt financing is very costly. Without any restrictions, such companies have more flexibility in their choice of future investments and therefore have a tendency to invest sub-optimally (i.e.,

underinvestment and asset substitution problem) to expropriate wealth from bondholders. Capital structure theory indicates that underinvestment and asset substitution problems are reduced if firms use less debt, shorter term debt and higher proportions of leasing. Consistent with this argument, leverage and debt maturity are negatively affected by growth opportunity, whereas leasing is positively associated with growth opportunity.

Firm size is positively related to leverage and debt maturity, but negatively associated with leasing. All of these relationships and their respective directions are consistent with the predictions postulated by agency theory rather than the asymmetric information explanation. Rajan and Zingales (1995) argue that larger firms tend to have lower levels of information asymmetry because capital market participants are more likely to have more information about larger firms. This argument implies that larger firms use less debt, long-term debt and leasing. That is, asymmetric information predicts that firm size is negatively associated with leverage and leasing, but positively associated with debt maturity. The 3SLS results show a negative association between firm size and leasing.

The impact of firm size on the capital structure variables in the simultaneous framework is more consistent with the agency explanation. Pettit and Singer (1985) argue that firm size is used to proxy the agency problem. In particular, they argue that smaller firms tend to have higher proportions of growth opportunities and thus are more likely to face potential conflicts of interest such as underinvestment, risk shifting and claim dilution between shareholders and bondholders. Since less debt, shorter term debt, and leasing reduce agency costs of debt, the agency perspective predicts that firm size is positively related to leverage and debt maturity, but negatively associated with leasing. These predictions are strongly supported by the 3SLS estimates.

Older firms tend to produce more information and therefore have less asymmetric information (Sharpe and Nguyen, 1995). This argument implies that firm age is positively affected by debt maturity but negatively influenced by leverage and leasing. In the leverage equation (column 2 of Table 8.1), the coefficient on firm age is negative and statistically significant, which is consistent with the information cost explanation. However, a positive association between firm age and leasing and a negative relation between firm age and debt maturity are both contrary to the asymmetric information hypothesis. Therefore, there is little support for the asymmetric information argument.

A key focus of this chapter are coefficients reflecting relationships among capital structure variables. Columns 2, 4 and 6 of Table 8.1, indicate that the interactions among leverage, debt maturity and leasing are generally statistically significant. For the leverage equation, the coefficient on debt maturity is negative, whereas on leasing it is positive. This indicates that firms with higher levels of debt have shorter term maturity and higher proportions of leasing. In addition, coefficients on leverage and leasing in the debt maturity equation are both positive, suggesting that firms with longer term debt have higher levels of leverage and higher proportions of leasing. Finally, the equation indicates that leasing decisions are positively associated with leverage and debt maturity decisions. Overall, these results provide support for the argument that various components of capital structure are chosen simultaneously.

Table 8.2 summarises the interactions among the capital structure decision variables as well as it compares these relationships with the predictions provided by the agency cost, information cost, and the financial distress cost hypotheses.

Table 8.2 Summary of Interactions Among Capital Structure Variables: Full Sample

Relationship	Empirical results	Agency costs hypothesis		Information cost hypothesis		Financial distress cost hypothesis	
		Substitute	Complement	Substitute	Complement	Substitute	Complement
Leverage → Debt maturity	n.s. *	-	+	+	-	+	-
Debt maturity → Leverage	-						
Leverage → Leasing	+	+	-	-	+	+	-
Leasing → Leverage	+						
Debt maturity → Leasing	+	+	-	+	-	-	+
Leasing → Debt maturity	+						

* not significant

Two interesting results emerge from Table 8.2. First, the bi-directional relationship between leverage and debt maturity is negative. However, the coefficient estimates on leverage in the debt-maturity regression is not statistically significant. These relationships might be due to model misspecification (Barclay *et al.*, 2003). That is, studies that focus on a limited number of capital structure decisions (i.e., either leverage, debt maturity or leasing) and exclude other endogenous policy variables such as debt mix, the convertibility of debt, the callability of debt, and other types of capital structure decisions, might be providing biased results. Unfortunately, data on other capital structure decisions (i.e., convertible debt, debt mix etc.) are not easily accessible in Australia and therefore it is difficult to judge whether the relationship between leverage and debt maturity is due primarily to model misspecification.

Second, although interactions among leverage, debt maturity and leasing variables do not exactly match any one of the six possible theoretical predictions, they nevertheless conform to the agency cost explanation (substitution argument). The bi-directional relationships between leverage-leasing and debt maturity-leasing are similar to that predicted by agency theory. Despite leverage's impact on debt maturity differs from the prediction provided by agency theory, the direction of the coefficient on debt maturity in the leverage equation is in line with the agency cost hypothesis. Therefore, five out of the six coefficients conform to agency theory explanations.

The relationship among capital structure for publicly listed firms in Australia is generally consistent with agency theory. Jensen and Meckling (1976) claim that rational debt-holders are aware of the possible actions of firms to expropriate debt-holders' wealth (i.e., through underinvestment and asset substitution). Thus, when debt is issued debt-holders increase the interest rate or in the case of bond issues, the price of bonds is

discounted for the expected losses these anticipated actions induce. An increase in interest rates and bond prices means that, on average, stockholders do not gain from any actions that will harm the debt-holders' interest. Hence, incentives are created for firms to offer several ways to limit possible conflicts of interest between shareholders and debt-holders. In this case, firms use lower leverage, shorter debt maturity and higher proportions of leasing interchangeably to control underinvestment and asset substitution problems.

In order to examine the robustness of the results, the 3SLS regression was re-estimated using different measures of capital structure variables. Robustness test results are reported in Table 8.3, which consists of three panels. In Panel A total liabilities to total capital was used as a leverage measure instead of total debt to total capital. Panel B replaces total long-term-debt to total debt with total long-term liabilities to total liabilities as a debt maturity measure. Finally, total lease to total assets is shown in Panel C as a leasing measure.

Table 8.3 Regression Results Using Alternative Measures of Capital Structure: Full Sample

Panel A (Measure of Leverage: Total Liabilities to Total Capital)

Variable	Leverage	Debt Maturity	Leasing
	(1)	(2)	(3)
Leverage	-	-0.0787	0.1560***
		(-0.83)	(6.26)
Debt maturity	-1.6513***	-	0.3103***
	(-4.98)		(13.57)
Leasing	6.4645***	2.9110***	-
	(7.13)	(8.59)	
Effective tax rate	-0.0041	-	-0.0001
	(-0.30)		(-0.13)
Growth opportunity	-0.2494***	-0.1302***	0.0386***
	(-7.47)	(-7.68)	(11.59)
Firm size	0.1806***	0.0967***	-0.0320***
	(6.28)	(12.30)	(-9.99)
Risk	0.0001	-0.0001	-
	(0.26)	(-0.61)	
Age	-0.1335***	-0.0675***	0.0217***
	(-3.05)	(-3.17)	(3.17)
Profitability	-0.0027	-	-
	(-0.68)		
Liquidity	-	-	0.0001***
			(3.02)
Asset tangibility	-0.0760	-	-
	(-0.46)		
Asset uniqueness	-	-	0.0053
			(0.56)
Asset maturity	-	0.0001*	-
		(1.69)	
Term structure of interest	-	0.0416	-
		(0.78)	
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel B (Measure of Debt Maturity: Total Long-term Liabilities to Total Liabilities)

Variable	Leverage	Debt Maturity	Leasing
	(1)	(2)	(3)
Leverage	-	-0.0174	0.1334***
		(-0.21)	(4.71)
Debt maturity	-1.0733*	-	0.3461***
	(-1.92)		(13.18)
Leasing	6.5126***	2.5555***	-
	(8.73)	(8.74)	
Effective tax rate	-0.0101	0.0003	-0.0002
	(-0.82)	(0.08)	(-0.18)
Growth opportunity	-0.2309***	-0.1067***	0.0345***
	(-8.40)	(-7.82)	(10.73)
Firm size	0.1213***	0.0747***	-0.0282***
	(3.67)	(11.23)	(-9.57)
Risk	0.0001	-0.0001	-
	(0.39)	(-0.50)	
Age	-0.1400***	-0.0634***	0.0247***
	(-3.70)	(-3.56)	(3.59)
Profitability	-0.0075**	-	-
	(-1.99)		
Liquidity	-	-	0.0001***
			(3.33)
Asset tangibility	-0.2589	-	-
	(-1.30)		
Asset uniqueness	-	-	0.0039
			(0.45)
Asset maturity	-	0.0001*	-
		(1.89)	
Term structure of interest	-	0.0294	-
		(0.67)	
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel C (Measure of Leasing: Total Lease (10%) to Total Assets)

Variable	Leverage	Debt Maturity	Leasing
	(1)	(2)	(3)
Leverage	-	0.0598	0.1329***
		(-0.69)	(7.45)
Debt maturity	-1.6257***	-	0.2367***
	(-5.18)		(9.77)
Leasing	7.5491***	3.6387***	-
	(7.95)	(7.70)	
Effective tax rate	-0.0048	-	0.0001
	(-0.37)		(0.09)
Growth opportunity	-0.1942***	-0.1179***	0.0257***
	(-7.25)	(-7.67)	(10.40)
Firm size	0.1859***	0.1009***	-0.0263***
	(6.77)	(13.07)	(-9.24)
Risk	-0.0001	-0.0001	-
	(-0.06)	(-0.94)	
Age	-0.1475***	-0.0726***	0.0201***
	(-3.57)	(-3.50)	(3.62)
Profitability	-0.0018	-	-
	(-0.58)		
Liquidity	-	-	0.0001
			(1.17)
Asset tangibility	-0.0247	-	-
	(-0.15)		
Asset uniqueness	-	-	0.0077
			(0.87)
Asset maturity	-	0.0001	-
		(1.20)	
Term structure of interest	-	0.0424	-
		(0.83)	
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Table 8.4 compares results reported in Tables 8.1 with results from the sensitivity analyses using different measures of capital structure variables presented in Table 8.3. Most of the bi-directional relationships among leverage, debt maturity and leasing still hold even after using different measures of capital structure.

Overall, the 3SLS estimates for the full sample support the argument that publicly listed firms in Australia use lower levels of leverage, shorter debt maturity and higher

proportions of leasing interchangeably to control underinvestment and asset substitution problems. Shareholders are aware that any costs associated with actions that expropriate debtholders' wealth are ultimately borne by shareholders themselves and therefore, shareholders are motivated to reduce the agency costs of debt.

Table 8.4 Summary of Tests for Robustness: Full Sample

Relationship	Sign of Capital Structure Coefficient			
	Table 8.1.	Table 8.3. Panel A	Table 8.3. Panel B	Table 8.3. Panel C
Leverage → Debt maturity	n.s. *	n.s.	n.s.	n.s.
Debt maturity → Leverage	-	-	-	-
Leverage → Leasing	+	+	+	+
Leasing → Leverage	+	+	+	+
Debt maturity → Leasing	+	+	+	+
Leasing → Debt maturity	+	+	+	+

* not significant

8.3 Joint Determination of Capital Structure: Family and Non-Family Firms

Previous chapters (i.e., chapters 6 and 7) demonstrate that family control significantly affects leverage, debt maturity and leasing decisions. Indeed, family control also influences the interaction among these capital structure decisions. Hypothesis 4 states that relationships among capital structure decisions will follow the financial distress cost arguments for family controlled firms. These firms are predicted to be risk averse to financial distress as this condition is costly for family shareholders. In other words, financial distress adversely affects the family firm's financial and human capital as well

as leads to a shift in control, which in turn affects the families' access to private benefits of control. Therefore, it is predicted that family controlled firms will use capital structure decisions jointly to reduce bankruptcy risk.

In order to test these hypotheses, the sample is divided into two groups: family and non-family shareholders. The regressions were then re-estimated separately for each group using a three stage least square (3SLS) procedure. The regression results are reported in Table 8.5.

Table 8.5 Regression Results: Family and Non-Family Firms

Variable	Leverage		Debt Maturity		Leasing	
	Family	Non-Family	Family	Non-Family	Family	Non-Family
	(1)	(2)	(3)	(4)	(5)	(6)
Leverage	-	-	-0.3241	0.6153***	0.7037***	-0.0804***
			(-0.82)	(10.46)	(7.01)	(-6.90)
Debt maturity	-0.9177***	1.0836**	-	-	0.5334***	0.2317***
	(-3.96)	(2.03)			(2.60)	(8.44)
Leasing	1.4376***	-11.280***	1.1393*	3.8066***	-	-
	(8.89)	(-3.24)	(1.95)	(5.21)		
Effective tax rate	-0.0058	0.0025	-	-	0.0051	-0.0002
	(-0.33)	(0.15)			(0.36)	(-0.47)
Growth opportunity	-0.2583***	0.0093	-0.2339**	-0.0208**	0.1822***	0.0012
	(-8.50)	(0.48)	(-2.00)	(-2.56)	(13.54)	(0.71)
Firm size	0.1241***	-0.0754*	0.1171***	0.0674***	-0.0773***	-0.0164***
	(4.76)	(-1.88)	(5.16)	(10.34)	(-4.19)	(-5.98)
Risk	-0.0011	-0.0001	-0.0003	-0.0001	-	-
	(-0.91)	(-1.18)	(-0.86)	(-0.47)		
Age	-0.1019***	0.0769*	-0.0805*	-0.0348*	0.0684**	0.0087***
	(-2.78)	(1.81)	(-1.93)	(-1.95)	(2.51)	(2.28)
Profitability	-0.0021	-0.0267	-	-	-	-
	(-0.75)	(-0.54)				
Liquidity	-	-	-	-	-0.0003	0.0001
					(-0.72)	(1.32)
Asset tangibility	0.0460	0.6259*	-	-	-	-
	(0.56)	(1.82)				
Asset uniqueness	-	-	-	-	0.0409	-0.0060
					(0.47)	(-0.79)
Asset maturity	-	-	0.0001	-0.0001	-	-
			(0.80)	(-0.23)		
Term structure of interest	-	-	0.1126	0.0079	-	-
			(1.31)	(0.17)		
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Table 8.6 presents a summary of the estimated relationships among capital structure decisions for family firms based on results in Table 8.5 and compares these associations with predictions provided by hypothesis 4, that is, predictions postulated by the agency cost, information cost and financial distress cost theories.

Table 8.6 Summary of Interactions Among Capital Structure Variables: Family Firms

Relationship	Empirical results	Agency costs hypothesis		Information cost hypothesis		Financial distress cost hypothesis	
		Substitute	Complement	Substitute	Complement	Substitute	Complement
Leverage → Debt maturity	n.s.*	-	+	+	-	+	-
Debt maturity → Leverage	-						
Leverage → Leasing	+	+	-	-	+	+	-
Leasing → Leverage	+						
Debt maturity → Leasing	+	+	-	+	-	-	+
Leasing → Debt maturity	+						

* not significant

Surprisingly, the estimated relationships among capital structure variables for family firms are generally not consistent with the financial distress hypothesis (see Table 8.6). Although, the feedback relationship between leasing and debt maturity is positive as predicted by financial distress hypothesis, the leverage-debt maturity and leverage-leasing interactions have the opposite direction to that predicted by financial distress argument.

Instead of supporting the financial distress cost hypothesis, relationships among capital structure decisions for family firms follow the explanations postulated by the agency cost hypotheses (see Table 8.6). A positive bi-directional relationship between leasing-leverage and leasing-debt maturity is consistent with the explanation provided by agency theory. Although the impact of leverage on debt maturity is insignificant, the impact of debt maturity on leverage is negative and statistically significant, which is in line with the agency theory explanation. Taken together, these relationships are generally consistent with the substitution argument provided by the agency cost hypothesis.

Further analyses on the impact of growth opportunity on capital structure decisions provide support for the explanatory power of the agency theory explanation. Table 8.7 presents the regression coefficients on growth opportunity for family and non-family firms (see Table 8.5).

Table 8.7 The Impact of Growth Opportunity on Capital Structure

	Family Firms	Non-family Firms
Leverage equation	-0.2583***	0.0093
	(-8.50)	(0.48)
Debt maturity equation	-0.2339**	-0.0208***
	(-2.00)	(-2.56)
Leasing equation	0.1822***	0.0012
	(13.54)	(0.71)

In all the regression equations, the coefficients on growth opportunity for family firms are significantly larger in absolute magnitude than the corresponding coefficients for non-family firms. In addition, while all coefficients on growth opportunity for family firms are coherent with the predictions (directions) of agency theory, most of the predictions for non-family firms are not. For example, there is no evidence that growth opportunity influences leverage and leasing. Also, the direction of the coefficient on growth opportunity in the leasing equation for non-family firms is inconsistent with theoretical prediction. Overall, results indicate that family firms use less leverage, shorter term maturity, and higher proportions of debt to control the agency costs of debt.

The evidence provided by these results demonstrate that family control has a strong incentive to reduce agency costs of debt and is consistent with Anderson *et al.*'s (2003) findings. Anderson *et al.* compare the cost of debt financing (using yield spread) of family and non-family firms in the U.S. After controlling for industry and firm-specific characteristics, their analysis indicates that the cost of debt financing for family firms is about 32 basis points lower than in non-family firms.

Anderson *et al.*'s (2003) findings are surprising as family firms are widely cited as being associated with a reduction in the agency cost of equity, but not the agency cost of

debt. Managers and large family shareholders are generally the same person and therefore, the residual claimants bear nearly all of the costs and receive nearly all of the benefits of their actions. In other words, family shareholders have enough incentives and ability to efficiently and directly monitor agents. As a result, family controlled firms are able to reduce conflicts of interest between managers and shareholders, and thus minimise the agency costs of equity.

Anderson *et al.* (2003) propose two explanations for why they believe family firms have lower agency costs of debt: the family's interest in the firm's long-term survival and the family's concern for the firm's (family's) reputation. First, they argue that founding families are more interested in firm survival as they often hold undiversified portfolios relative to atomistic shareholders and they seek to pass the firm on to their heirs. Founding families view their firms as an asset to bequeath to family members or their descendents rather than as wealth to consume during their lifetimes. Specifically, the families' interests lie in passing the firm as a going concern to their heirs rather than merely passing their wealth. Firm survival is thus an important concern for families, suggesting that relative to other large shareholders, they are more likely to maximise firm value. As such, any firm value destroying action, such as underinvestment and asset substitution will be minimised and therefore, family firms will exhibit lower costs of debt relative to non-family firms.

Second, founding families face reputation concerns that arise from the family's sustained presence in the firm and their effect on third parties. The long-term nature of founding-family ownership suggests that external parties, such as debt-holders, are more likely to deal with the same governing bodies and practices for longer periods in family firms than in non-family firms. For example, banks and other parties often develop

personal and well-informed relationships with company executives, suggesting that the family's presence allows these relationships to build over successive generations. Thus, the family's reputation is more likely to create longer-lasting economic consequences for the firm relative to non-family firms, where the turnover of managers and directors is conducted on a more frequent basis. If families seek to maintain favourable reputations (including from the lenders point of view), it is expected that a negative relation exists between debt yields and family ownership.

While family firms are more likely to use the interaction of capital structure to reduce incentive problems, non-family firms tend to employ them to reduce information costs. Table 8.8 summarises the interactions among capital structure variables for non-family firms. The association between leverage and leasing is negative and similarly debt maturity is negatively related to leverage and leasing. These relationships are consistent with the substitution prediction of the information cost hypothesis.

Table 8.8 Summary of Interactions Among Capital Structure Variables: Non-family Firms

Relationship	Empirical results	Agency costs hypothesis		Information cost hypothesis		Financial distress cost hypothesis	
		Substitute	Complement	Substitute	Complement	Substitute	Complement
Leverage → Debt maturity	+	-	+	+	-	+	-
Debt maturity → Leverage	+						
Leverage → Leasing	-	+	-	-	+	+	-
Leasing → Leverage	-						
Debt maturity → Leasing	+	+	-	+	-	-	+
Leasing → Debt maturity	+						

Gugler (2003) argues that large asymmetries of information between management and shareholders are present in non-family controlled firms. This is because managers and shareholders of non-family firms are different persons. For example, managers in widely-held firms are generally not shareholders. Due to the free rider problem, widely-held firms are usually manager-controlled. Even state-controlled firms and firms with large institutional shareholders can be viewed as manager-controlled. The ultimate owners of state controlled firms are the citizens. As they do not control the corporations directly, however, they elect governments to provide the necessary controls. Unfortunately, politicians themselves may not actively monitor managers of state-controlled firms. In short, the person who manages and owns the firm is different in a widely-held firm or in firms with non-family large shareholders. As a result, there is large asymmetric information. One way to reduce this problem is to use capital structure decisions jointly.

Similar to the robustness tests conducted on the full sample, different measures of capital structure were used to check the sensitivity of the impact of ownership structure on capital structure decisions. The robustness test results are reported in Table 8.9, which consists of three panels. In Panel A, total liabilities to total capital is used as a measure of leverage instead of total debt to total capital. Panel B replaces total long-term-debt to total debt with total long-term liabilities to total liabilities as a debt maturity measure. Total lease to total assets is used in Panel C as a leasing measure.

Table 8.9 Regression Results Using Alternative Measures of Capital Structure: Family and Non-Family Firms

Panel A (Measure of Leverage: Total Liabilities to Total Capital)

Variable	Leverage		Debt Maturity		Leasing	
	Family	Non-family	Family	Non-family	Family	Non-family
	(1)	(2)	(3)	(4)	(5)	(6)
Leverage	-	-	-0.3172	0.6521***	0.5785***	-0.0913***
			(-1.08)	(10.84)	(7.26)	(-7.77)
Debt maturity	-0.8815***	0.5615	-	-	0.4371***	0.2327***
	(-4.55)	(1.21)			(2.81)	(8.52)
Leasing	1.3787***	-9.741***	1.3801***	3.9713***	-	-
	(9.12)	(-3.23)	(2.72)	(5.23)		
Effective tax rate	0.0021	0.0049	-	-	0.0048	-0.0003
	(0.17)	(0.33)			(0.47)	(-0.94)
Growth opportunity	-0.2684***	-0.0155	-0.2231***	-0.0071	0.1420***	-0.0008
	(-9.28)	(-0.96)	(-2.77)	(-0.81)	(13.77)	(-0.47)
Firm size	0.1071***	-0.0356	0.1192***	0.0658***	-0.0654***	-0.0160***
	(4.64)	(-1.01)	(6.36)	(9.66)	(-4.62)	(-5.83)
Risk	-0.0001	-0.0001	-0.0003	-0.0001	-	-
	(-0.46)	(-1.50)	(-0.91)	(-0.24)		
Age	-0.0778**	0.0689**	-0.0830**	-0.0411**	0.0583***	0.0094**
	(-2.15)	(1.96)	(-2.35)	(-2.21)	(2.80)	(2.45)
Profitability	-0.0017	-0.0028	-	-	-	-
	(-0.64)	(-0.66)				
Liquidity	-	-	-	-	-0.0002	0.0001***
					(-0.83)	(3.23)
Asset tangibility	0.0194	0.6815**	-	-	-	-
	(0.29)	(2.30)				
Asset uniqueness	-	-	-	-	0.0387	-0.0054
					(0.60)	(-0.72)
Asset maturity	-	-	0.0001	0.0001	-	-
			(0.58)	(0.15)		
Term structure of interest	-	-	0.1053	0.0100	-	-
			(1.42)	(0.21)		
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel B (Measure of Debt Maturity: Total Long-term Liabilities to Total Liabilities)

Variable	Leverage		Debt Maturity		Leasing	
	Family	Non-family	Family	Non-family	Family	Non-family
	(1)	(2)	(3)	(4)	(5)	(6)
Leverage	-	-	-0.4603	0.4364***	0.6358***	-0.0545***
			(-1.55)	(7.13)	(6.91)	(-2.85)
Debt maturity	-1.1365***	5.6087***	-	-	0.7489***	0.2585***
	(-5.85)	(3.85)			(6.96)	(9.38)
Leasing	1.5519***	-4.756	1.2351***	3.4441***	-	-
	(9.28)	(-0.92)	(2.85)	(7.64)		
Effective tax rate	-0.0017	0.0094	-	-	-0.0008	-0.0001
	(-0.13)	(0.41)			(-0.09)	(-0.53)
Growth opportunity	-0.2743***	-0.0061	-0.2422***	-0.0192***	0.1771***	0.0019
	(-9.15)	(-0.27)	(-2.79)	(-2.86)	(13.52)	(1.08)
Firm size	0.1096***	-0.2874***	0.0870***	0.0527***	-0.0715***	-0.0144***
	(5.54)	(-3.79)	(4.69)	(9.80)	(-5.96)	(-6.36)
Risk	-0.0001	0.0001	-0.0001	-0.0001	-	-
	(-1.03)	(1.06)	(-0.18)	(-0.71)		
Age	-0.0972***	0.1293***	-0.0721**	-0.0383***	0.0632**	0.0106***
	(-2.92)	(2.63)	(-1.98)	(-2.65)	(2.34)	(2.65)
Profitability	-0.0023	-0.0053	-	-	-	-
	(-1.05)	(-0.69)				
Liquidity	-	-	-	-	-0.0001	0.0001
					(-1.10)	(0.89)
Asset tangibility	0.0383	-1.3306*	-	-	-	-
	(0.61)	(-1.79)				
Asset uniqueness	-	-	-	-	0.0205	-0.0037
					(0.46)	(-0.91)
Asset maturity	-	-	0.0001	-0.0001	-	-
			(0.68)	(-0.01)		
Term structure of interest	-	-	0.1271	-0.0029	-	-
			(1.61)	(-0.08)		
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Panel C (Measure of Leasing: Total Lease (10%) to Total Assets)

Variable	Leverage		Debt Maturity		Leasing	
	Family	Non-family	Family	Non-family	Family	Non-family
	(1)	(2)	(3)	(4)	(5)	(6)
Leverage	-	-	-0.3172	0.6529***	0.5785***	-0.0822***
			(-1.08)	(11.74)	(7.26)	(-7.91)
Debt maturity	-0.9267***	1.3005***	-	-	0.4371***	0.2203***
	(-4.11)	(2.58)			(2.81)	(8.53)
Leasing	1.7475***	-11.502***	1.3801***	3.9877***	-	-
	(8.93)	(-3.45)	(2.72)	(5.39)		
Effective tax rate	-0.0069	0.012	-	-	0.0048	-0.0002
	(-0.44)	(0.08)			(0.47)	(-0.49)
Growth opportunity	-0.2441***	0.0037	-0.2231**	-0.0176**	0.1420***	0.0005
	(-8.83)	(0.21)	(-2.77)	(-2.30)	(13.77)	(0.35)
Firm size	0.1281***	-0.0967**	0.1192***	0.0685***	-0.0654***	-0.0159***
	(4.95)	(2.45)	(6.36)	(10.62)	(-4.62)	(-6.15)
Risk	-0.0001	-0.0001	-0.0003	-0.0001	-	-
	(-0.99)	(-1.03)	(-0.91)	(-0.48)		
Age	-0.1055***	0.0750*	-0.0083**	-0.0336*	0.0583***	0.0081**
	(-3.05)	(1.83)	(-2.35)	(-1.89)	(2.80)	(2.20)
Profitability	-0.0031	-0.0035	-	-	-	-
	(-0.88)	(-0.74)				
Liquidity	-	-	-	-	-0.0002	0.0002
					(-0.83)	(1.18)
Asset tangibility	0.0496	0.5072*	-	-	-	-
	(0.65)	(1.66)				
Asset uniqueness	-	-	-	-	0.0387	-0.0047
					(0.60)	(-0.72)
Asset maturity	-	-	0.0001	-0.0001	-	-
			(0.58)	(-0.26)		
Term structure of interest	-	-	0.1053	0.0071	-	-
			(1.42)	(0.16)		
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Table 8.10 compares the results presented in Tables 8.5 and 8.9. It is clear from the table that regardless of which capital structure proxy is used, the results are generally consistent with earlier analyses.

Overall, the results of the simultaneous equations system provide evidence that family firms use interactions among capital structure decisions (i.e., leverage, debt maturity and leasing) to reduce the agency costs of debt, while non-family controlled firms use

capital structure decisions to reduce information costs. Families have incentives to reduce the agency costs of debt because these costs affect shareholder value. As indicated by agency theory, lenders increase interest rates if they anticipate that any actions by managers (on behalf of shareholders) will harm their wealth (e.g., via underinvestment and asset substitution). Since families have an interest in the firm's long-term survival (such as passing on the firm to their heirs), they will minimise any actions that reduce firm value. In addition, the families' concern with their reputation prevents them from exploiting debtholders. Anticipating these favorable actions, lenders are willing to reduce the costs of borrowing. In contrast, non-family firms reduce information costs capital structure decisions jointly.

Table 8.10 Summary of Robustness Tests: Family and Non-family Firms

Relationship	Family Firms				Non-family Firms			
	Table 8.5	Table 8.9.			Table 8.5	Table 8.9.		
		Panel A	Panel B	Panel C		Panel A	Panel B	Panel C
Leverage → Debt maturity	n.s.*	-	n.s.	n.s.	+	n.s.	+	+
Debt-maturity → Leverage	-	-	-	-	+	+	+	+
Leverage → Leasing	+	+	+	+	-	-	-	-
Leasing → Leverage	+	+	+	+	-	-	n.s.	-
Debt maturity → Leasing	+	+	+	+	+	+	+	+
Leasing → Debt maturity	+	+	+	+	+	+	+	+

* not significant

8.4 Chapter Summary

This chapter investigates the impact of family control on relationships among capital structure decisions. There are two main results. First, the 3SLS results provide bi-

directional relationships among leverage, debt maturity and leasing decisions, and these associations are generally statistically significant. This suggests that various components of capital structure are chosen simultaneously to reduce incentive and information problems.

Second, family firms use leverage, debt maturity and leasing interchangeably to reduce the agency costs of debt. The family's interest in the firm's long-term survival and the family's concern with its reputation motivates family firms to limit any actions that will destroy firm value. As indicated by agency theory, risk shifting and underinvestment are actions that are intended to expropriate value from debtholders. However, sophisticated debtholders can anticipate these actions and adjust interest rates accordingly. As a result, costs from risk shifting and underinvestment will be borne by shareholders. This motivates shareholders to reduce the problem through capital structure choices (i.e., leverage, debt maturity and leasing decisions).

CHAPTER 9
SUMMARY AND CONCLUSION

9.1 Main Findings and Implications

Ownership structure influences the incentives of managers and shareholders and has an impact on capital structure decisions. One important aspect of ownership structure is family control. Families represent a special class of large shareholders that potentially have unique incentive structure and power in the firm (Anderson *et al.*, 2003). From agency and incomplete contract perspectives, there are two characteristics of families that make them different from other types of large shareholders or managers of widely-held firms. First, the combination of highly valued private benefits of control and significant firm-specific human capital motivate families to maintain control of their company. Second, with substantial wealth and human capital at risk, family owners tend to be more risk averse than their non-family counterparts. These unique characteristics provide the underlying reasoning why capital structure decisions of family firms differ from those of non-family firms.

Panel data from publicly listed firms in Australia from 1998 to 2002 were used to investigate the impact of family control on capital structure decisions. Employing various panel data regression techniques, this study found that family firms in Australia have higher levels of leverage, longer term debt maturity and higher proportions of leasing compared to non-family firms. In addition, the results show that family controlled firms tend to use interactions among capital structure decisions (i.e.,

leverage, debt maturity and leasing) to reduce the agency costs of debt resulting from conflicts of interest between shareholders and debtholders.

The result that family firms have higher levels of debt is consistent with the argument that families use debt to concentrate voting power. The objective is to protect the families' highly valued private benefits of control and firm-specific human capital. Since debt has no voting power, the issuance of debt instead of new equity protects the dominance of families. Additional analyses on the data based on industry (i.e., mining versus industrial sectors) and firm size (i.e., small versus large firms), provides evidence that the desire to use debt to maintain control is stronger for family firms operating in the mining sector (where private benefits of control is higher) and among smaller family firms (where the families' financial constraint is not a crucial issue).

The impact of family control among Australian firms is surprisingly similar to that experienced by family firms in Thailand (Wiwattanakantang, 1999). Due to weaker investor protection, Thai family firms have a stronger desire to consolidate control and therefore use more debt (Claessens and Fan, 2002). Similarly, the results of this study indicate that Australian family firms use more debt than non-family firms. However, the result is contrary to Claessens and Fan's property rights argument. Claessens and Fan argue that in countries with strong investor protection, such as Australia, the desire to control is lower and therefore, family controlled firms employ lower levels of leverage.

The leverage decisions of family firms in Australia are perhaps more consistent with the argument propounded by Bebchuk (1999), who provides a private benefits of control hypothesis. Bebchuk suggests that comparatively large private benefits of control are likely to exist in family controlled firms. This argument implies that family firms have a

stronger desire to control and protect their private benefits of control and therefore employ more debt to consolidate their voting power.

With regard to debt structure decisions (i.e., type of debt used), family controlled firms use debt maturity and leasing decision more frequently to reduce the probability of financial distress. Financial distress can be very costly for family shareholders because it adversely affects their significant financial and human capital. More importantly, financial distress generally leads to a shift in control from family to lenders and therefore, families lose benefits from controlling their firms. A combination of these factors motivates families to reduce firm risk by avoiding shorter-term debt and using higher proportions of lease contracts. By its nature, short-term debt must be negotiated frequently. Although short-term debt is used by firms to avoid locking their financing costs with long-term debt, it nonetheless has liquidity risk. At negotiation date, bad news might become available and borrowers are forced into inefficient liquidation because refinancing is not available or the costs of borrowing are high. Similar to short-term debt, leasing is used to reduce financial distress risk. That is, by using lease contracts, firms (i.e., lessees) effectively transfer the risk associated with the use of assets to leasing companies (i.e., lessors).

Further analyses using the simultaneous equations system support the argument that family firms in Australia use leverage, debt maturity and leasing interchangeably to reduce the agency costs of debt, while their non-family counterparts tend to employ capital structure decisions to reduce information costs. The finding that families tend to reduce the conflict of interest between shareholders and debtholders is surprising. Family firms are widely cited as being associated with a reduction in the agency cost of equity, but not the agency cost of debt (see for example Jensen and Meckling, 1976).

However, the result is more consistent with Anderson *et al.*'s (2003) finding, who found that family firms in the US are more able to obtain cheaper debt than their non-family counterparts. As indicated by agency theory, the costs associated with underinvestment and asset substitution are ultimately borne by shareholders. The family's interest in the firm's long-term survival and its concern with reputation motivates them to limit these actions for the sake of the firm's performance. Anticipating these favorable actions, lenders are willing to reduce the costs of borrowing.

Implications - The findings of this study provide several important implications. First, capital structure decisions of family firms are different as a result of their unique incentive structure and provides support to extant literature showing that family controlled firms differ from non-family firms. Thus this study adds to the growing literature on family firms which find that these firms differ from non-family firms in term of performance (Anderson and Reeb, 2003a; McConaughy *et al.*, 1998; Claessens *et al.*, 2002; Palia and Ravid, 2002), the agency costs of debt (Anderson *et al.*, 2003), insurance policy (Mayers and Smith, 1990), takeover activity (Boehmer, 2000; Holderness and Sheehan, 1985), executive compensation (Kole, 1997), governance structure (Anderson and Reeb, 2003c), and the use of dual class shares (DeAngelo and DeAngelo, 1985; Taylor and Whittered, 1997; Amoako-Adu and Smith, 2001).

Second, the results of this study provide evidence that capital structure decisions are not only affected by ownership concentration but also by ownership composition. This is consistent with the argument of Holderness and Sheehan (1988) and Gugler's (2001) argument that the identity of large shareholders does matter in financing decisions and therefore, academic studies and public debates should not ignore the identity of blockholders. Therefore, these findings add to the understanding of the forces that

influence corporate financing behaviour by shedding further light on the determinants of capital structure, particularly in relation to ownership composition and control.

Third, McConaughy *et al.* (1998) and Anderson and Reeb (2003a) found that family firms perform better than non-family firms. This study shows that family control has an impact on capital structure decisions, while Myers (2001, 2003) argues that capital structure decisions can add to the firm's value Therefore, a positive impact of family control on firm value is likely to be mediated by its capital structure decisions. In short, studying the relationship between ownership and capital structures assists in further explaining the link between ownership composition, capital structure and firm value. However, future research needs to be done to establish this link better.

9.2 Limitations

This study has at least three limitations. The first limitation is related to the measure of debt maturity. A proportion of long-term debt to total debt is used as a main proxy of debt maturity in this study. Although, this measure was used in previous studies such as Titman and Wessel (1988) and Barclay and Smith (1995a), it is an imprecise measure. More recently, several studies on debt maturity in the US (e.g., Stohs and Mauer, 1996; Guedes and Opler, 1996) have used more accurate measures of debt maturity. For example, Stohs and Mauer (1996) developed a debt maturity structure measure by computing the book value-weighted average maturity of the debt outstanding, debt-like obligations and current liabilities. In order to calculate this measure, detailed information regarding the type and maturity of each debt instrument outstanding in a firm's fiscal year-end is required. Given limited disclosure requirement of liabilities in

Australian financial statements, it was not possible to follow Stohs and Mauer's (1996) weighted-average debt maturity procedure.

The second limitation relates to the type of capital structure decisions. This study focused on leverage, debt maturity, and leasing decisions (which represents the priority structure of debt). Capital structure decisions are not only limited to these three decisions. Financing decisions are also related to whether debt is privately placed or held by widely-dispersed public investors (i.e., debt mix), in foreign or domestic currency, convertible, callable, and borrowed from one or more lender. However, data unavailability precluded this study from obtaining information on these different financing decisions. Omission of capital structure decisions other than leverage, debt maturity and leasing decisions might bias the estimated coefficients due to model misspecifications (Barclay *et al.*, 2003).

The third limitation relates to methodology. The fixed effects method was not used in this study due to the existence of time invariant variable (i.e., family control and industry). Wooldridge (2000) argues that when unobserved variables are correlated with some explanatory variable, the fixed effects estimator is needed as the random effects regression is generally inconsistent. As unobserved variables in this study (e.g., managers' or shareholders' preferences) are likely to affect explanatory variables such as business risk and firm size, it is important to employ a fixed effects regression, instead of a random effects estimator. Currently, a new technique called the Hausman-Taylor has been developed to estimate the effect of time invariant variables and to take into account unobserved variables correlating with the explanatory variables (Verbeek, 2004).

9.3 Future Research Directions

There are two interesting future research directions. The first recommendation is associated with the omission of capital structure decisions other than leverage, debt maturity and leasing decisions. As the exclusion of the variables might bias the estimated coefficients due to model misspecifications, future research into Australian capital structure decisions should focus on gaining access to detailed corporate financing policies to provide a more comprehensive understanding of capital structure decisions and its relationship to both ownership and corporate structure.

The second research direction is related to heterogeneity among family firms. It is well known that family firms are not homogeneous organisations. For example, some family businesses are led by the founder while others by the founders' heirs. Morck *et al.* (1988) reveal that founders of "young" firms improve firm value whereas "older" firms are associated with lower firm value. Morck *et al.* argue that these differences in firm value are due to different incentive structures created by owners of firms, which have a direct impact on firm performance.

Corbetta and Salvatore (2004) classify family firms into three groups based on ownership, the presence of shareholders and managers external to the family, active involvement of family members, and number of generations involved in the firm. The resulting family firm types are: (1) the founder-centered family firm; (2) the sibling – cousin consortium, which is fully owned and managed by families; and (3) the open family firm, in which ownership is partially shared with non-family shareholders. Corbetta and Salvatore argue that these firms differ in their role of founder and

entrepreneurial orientations. They also conjecture that agency costs are different in each type of firm.

Villonga and Amid (2004) examine how family ownership, control and management interact with one another in their effects on firm value. They divided family firms into three groups: (1) family firms with control-enhancing mechanisms (dual-share classes, pyramids, cross-holdings, or voting agreements) and a family CEO; (2) family firms with control-enhancing mechanisms but no family CEO; and (3) family firms with a family CEO but no control-enhancing mechanisms. They found differences in their performance.

In short, the above argument implies that within family firms, there are several sub-groups with different incentive structures. Incorporating these different characteristics within family firms into capital structure research will provide a richer perspective on family controlled firms in the capital markets and offer a promising avenue for future research.

9.4 Conclusion

This study provides empirical evidence that family firms use higher levels of leverage, longer term debt maturity, and higher proportions of leasing. Further analyses using the simultaneous equations system shows that family firms in Australia use leverage, debt maturity and leasing interchangeably to reduce the agency costs of debt.

Overall, the study supports existing theory that incentive structures of family firms differ from that of non-family firms. However, this unique incentive structure affects capital structure decisions in different ways. When choosing the level of debt, the family's desire to maintain control is stronger. In contrast, the incentive to reduce bankruptcy risk is more prevalent when families decide on the type of debt (i.e., the maturity of debt and the priority of debt) they will use. Finally, families are motivated to reduce the agency costs of debt when decision related to interactions among capital structure variables must be made.

References

Adedeji, A., and R.C. Stapleton, 1996, Leases debt and taxable capacity, *Applied Financial Economics* 6, 71-83.

Adrade, G. and S.N. Kaplan, 1998, How costly is financial (not economic) distress? Evidence from highly leverage transactions that become distress, *Journal of Finance* 53, 1443-1493.

Aghion, P., and P. Bolton, 1992, An incomplete contracts approach to financial contracting, *Reviews of Economic Studies* 59, 473-494.

Agrawal, A. and G. Mandelker, 1987, Managerial incentives, corporate investment, and financing decisions. *Journal of Finance* 42, 823-837.

Agrawal, A. and N. Nagarajan, 1990, Corporate capital structure, agency costs, and ownership control: The case of all-equity firms, *Journal of Finance* 45, 1325-1331.

Akerlof, G., 1970, The market for lemons: qualitative uncertainty and the market mechanism, *Quarterly Journal of Economics* 84, 288-300.

Alchian, A.A. and H. Demzetz., 1972, Production, information costs, and economic organization, *American Economic Review*, 62, 777-795.

Altman, E.I., 1969, Corporate Bankruptcy Potential, Stockholder Returns and Share Valuation, *Journal of Finance* 24, 887-900.

Altman, E. I., 1984, A further empirical investigation of the bankruptcy cost question, *Journal of Finance* 39: 1067-1089.

Amihud, Y. and B. Lev, 1981, Risk reduction as a managerial motive for conglomerate mergers, *Bell Journal of Economics* 12, 605-617.

Amokako-Adu, B. and B. F. Smith, 2001, Dual class firms: Capitalization, ownership structure and recapitalization back into single class, *Journal of Banking and Finance* 25, 1083-1111.

Anderson, R.C., S.A. Mansi, and D.M. Reeb, 2003, Founding family ownership and the agency cost of debt, *Journal of Financial Economics* 68, 263-285.

Anderson, R.C. and D.M. Reeb, 2003a, Founding family ownership and firm performance: Evidence from the S&P 500, *Journal of Finance* 58, 1301-1328.

Anderson, R.C. and D.M. Reeb, 2003b, Founding family ownership, corporate diversification and firm leverage, *Journal of Law and Economics* (October), 653-684.

Ang, J.S., R.A. Cole and J.W. Lin, 2000, Agency costs and ownership structure, *Journal of Finance* 55, 81-106.

Baltagi, B.H., 2002, *Econometric analysis of panel data*, John Wiley and Sons : Chichester.

Barclay, M. J. and C. G. Holderness, 1992, The law and large-block trades, *Journal of Law and Economics* 35, 265-294.

Barclay, M. J., L. M. Marx and C.W. Smith, 2003, The joint determination of leverage and maturity, *Journal of Corporate Finance* 9, 149-167.

Barclay, M. J., C. W. Smith and R.L. Watts, 1995, The determinants of corporate leverage and dividend policies, *Journal of Applied Corporate Finance* (Winter), 4-19.

Barclay, M. J. and C. W. Smith, 1995a, The maturity structure of corporate debt, *Journal of Finance* 50, 609-631.

Barclay, M. J. and C. W. Smith, 1995b, The priority structure of corporate liabilities, *Journal of Finance* 50, 899-917.

Barnea, A., R. Haugen and L.W. Senbet , 1980, A rationale for debt maturity structure and call provisions in the agency theoretic framework, *Journal of Finance* 35,1223-1234.

Barney, J.B., 2002, *Gaining and sustaining competitive advantage*, Prentice Hall: Upper Saddle River, NJ

Beattie, V., A. Goodacre and S. Thomson, 2000, Operating lease and the assessment of lease-debt substitutability, *Journal of Banking and Finance* 24, 427-470.

Bebchuk, L., 1999, A rent protection theory of corporate ownership and control, Working Paper, Harvard University

Becker, G.S., 1964, *Human Capital*, Columbia University Press: New York.

Becker, G.S., 1981, *A treatise on family*, Harvard University Press: Cambridge MA.

Bennett, B.K. and M.E. Bradbury, 2003, Capitalizing non-cancelable operating leases, *Journal of International Financial Management and Accounting* 14, 101-114.

Berger, P. and E. Offek, 1994, Diversification's effect on firm value, *Journal of Financial Economics* 37, 39-65.

Berle, A. A. and G. C. Means, 1932, *The modern corporation and private property*. New York, Macmillan.

Besanko, D., D. Dranove and M. Shanley, 2004, *Economics of strategy*, Wiley: New Jersey

Bishop, S., R. Faff, B. Oliver and G. Twite, 2004, *Corporate Finance*, Prentice Hall: Sydney

Black, B., 1992, The value of institutional investor monitoring: the empirical evidence, *UCLA Law Review* 39, 895-939

Black, F. and M. Scholes, 1973, The pricing of options and corporate liabilities, *Journal of Political Economy*, 637-654.

Blair, M.M., 1995, *Ownership and control*, The Brooking Institution: Washington DC.

Bodie, Z. and R.A. Taggart, 1978, Future investment opportunities and the value of the call provision on a bond, *Journal of Finance* 33, 1187-1200

Boehmer, E., 2000, Business groups, bank control, and large shareholders: An analysis of German takeovers, *Journal of Financial Intermediation* 9, 117-148

Bolton, P. and D.S. Scharfstein, 1990, A theory of predation based on agency problems in financial contracting, *American Economic Review* 80, 94-106

Bolton, P. and D.S. Scharfstein, 1998, Corporate finance, the theory of the firm, and organizations, *Journal of Economic Perspective* 12, 95-114

Borsch-Supan, A. and J. Koke, 2002, An applied econometricians' view of empirical corporate governance studies, *German Economic Review* 3, 295-326.

Brailsford, T. J., B. R. Oliver, and S. L.H. Pua, 2002, On the relation between ownership structure and capital structure, *Accounting and Finance* 42, 1-26.

Brick, I. and S. A. Ravid, 1985, On the relevance of debt maturity structure, *Journal of Finance* 40, 1423-1437.

Brigham E.F. and L.C. Gapensi, 1993, *Intermediate financial management*, Dryden Press: Fort Worth.

Burkart, M., F. Panunzi, and A. Shleifer, 2003, Family firms, *Journal of Finance* 58, 2167-2202.

Byrd, J., R. Parrino, and G. Pritsch, 1998, Stockholder-Manager conflicts and firm value, *Financial Analyst Journal* (May/June), 14-30.

Capulong, M., D. Edward, D. Webb, and J. Zhuang (eds), 2000, *Corporate governance and finance in East Asia : A study of Indonesia, Republic of Korea, Malaysia, Philippines and Thailand,* Asian Development Bank : Manila.

Castanias, R.P. and C.E. Helfat, 1992, Managerial and windfall rents in the market for corporate control, *Journal of Economic Behavior and Organization* 18, 153-184.

Chami, R., 1999, What's different about family businesses? IMF Working paper

Chang, C., 1989, Debt maturity structure and bankruptcy, Working Paper University of Minnesota

Cheung, C.S. and J.C. Gaa, 1989, Controlling opportunistic behavior in corporate governance: The role of disproportionate voting shares and coat-tail provisions, *Journal of Institutional and Theoretical Economics* 145, 438-450.

Claessens, S., S. Djankov, J. Fan and L.H.P. Lang, 2002, Disentangling the incentive and entrenchment effects of large shareholdings, *Journal of Finance* 31, 2741-2771.

Claessens, S. and J.P.H. Fan, 2002, Corporate governance in Asia: A Survey. *International Review of Finance* 3, 71-103.

Coase, R., 1937, The nature of the firm, *Economica* November, 386-405.

Comment, R. and G. A. Jarrel, 1994, Corporate focus and stock returns, *Journal of Financial Economics* 37, 67-87.

Corbetta, G. and C. Salvatore, 2004, Self-serving or self-actualizing? Models of man and agency costs in different types of family firm, *Entrepreneurship Theory and Practice* (Summer), 355-362

Daily, C.M. and M.J. Dollinger, 1992, An empirical analysis of ownership structure in family and professionally-managed firms, *Family Business Review* 5, 117-136.

DeAngelo, H. and L. DeAngelo, 1985, Managerial ownership of voting rights: a study if public corporation with dual classes of common stock, *Journal of Financial Economics* 14, 33-39.

Demsetz, H. and K. Lehn, 1985, The structure of corporate ownership: Causes and consequences, Journal of Political Economy 93, 1155-1177.

Denis, D. and D. Denis, 1994, Majority-owner managers and organizational efficiency, *Journal of Corporate Finance* 1, 91-118.

Diamond, D. W., 1991, Debt maturity structure and liquidity risk, *Quarterly Journal of Economics* 106, 709-737.

Douma, S. and H. Schreuder, 2003, *Economic approaches to organizations*, Financial Times Prentice Hall: Harlow

Drury, C., and S. Braund, 1990, The leasing decision: A comparison of theory and practice, *Accounting and Business Research* 20, 179-191

Dyck, A. and L. Zingales, 2003, Private benefits of control: An international comparison, *Journal of Finance* 59, 537-600.

Dyer, W.G., 2003, The family: Missing variables in organizational research, *Entrepreneurship Theory and Practice* 27, 401-416

Ehrhardt, O. and E. Nowak, 2003, Private benefits and minority shareholder expropriation, Working Paper.

Eisenhardt, K., 1989, Agency theory: An assessment and review, *Academy of Management Journal* 14, 57-74.

Emmery, D.R. and J.D. Finnerty, 2001, *Corporate financial management*, Prentice Hall: Upper Saddle River NJ

Ezzell, J.R. and P.P. Vora, 2001, Leasing versus purchasing: Direct evidence on a corporation's motivations for leasing and consequences of leasing, *The Quarterly Review of Economics and Finance* 41, 33–47.

Faccio, M., L. H. P. Lang, L. Young, 2001, Dividends and expropriation, *American Economic Review* 91, 54-78.

Faccio, M., and L. Lang, 2002, The ultimate ownership of Western European Corporations, *Journal of Financial Economics* 65, 365-395.

Fama, E. and M. Jensen, 1983, Separation of ownership and control, *Journal of Law and Economics* 26, 301-325.

Fan, J.P.H. and T.J. Wong, 2002, Corporate ownership structure and the informativeness of accounting earnings in East Asia, *Journal of Accounting and Economics* 33, 401-425.

Finnerty, J.D. and D. R. Emery, 2001, *Debt management: A practitioner's guide*, Harvard Business School Press.

Flannery, M., 1986, Asymmetric information and risky debt maturity choice, *Journal of Finance* 41, 18-38.

Flath, D., 1980, The economics of short-term leasing, *Economic Inquiry* 18, 243-255.

Foss, N.J., H. Lando and S. Thomsen, 2000, The theory of the firm in Bouckaert, B. and D. Gerrit (eds.), *Encyclopedia of Law and Economics* , Elgar, Cheltenham

Foster, G., 1986, *Financial statement analysis*, Prentice Hall: New Jersey

Frank, M.Z. and V.K. Goyal, 2003, Capital structure decisions, Paper presented at AFA 2004 San Diego Meetings.

Friend, I. and L. Lang, 1988, An empirical test if the impact of managerial self-interest in corporate capital structure, *Journal of Finance* 43, 271-281.

Froot, K.A, D.S. Scharfstein and J.C. Stein, 1993, Risk management: Coordinating corporate investment and financing policy, *Journal of Finance* 48, 1629-1658.

Gilson, S., 1989, Management turnover and financial distress, *Journal of Financial Economics* 25, 241-262.

Gilson, S.C., 1990, Bankruptcy, boards, banks, and blockholders, *Journal of Financial Economics* 27, 355-387.

Gomez-Mejia, L.R., M. Nunez-Nickel, I. Gutierrez, 2001, The role of family ties in agency contact, *Academy of Management Journal* 44, 81-95.

Gomez-Mejia, L.R., M. Nunez-Nickel, I. Gutierrez, 2003, The determinants of executive compensation in family-controlled public corporations, *Academy of Management Journal* 46, 226-237.

Gorton, G. and M. Kahl, 1999, Blockholder identity, equity ownership structures, and hostile takeovers, NBER Working Paper Series No. 7123.

Goyal, V.K., K. Lehn and S. Racic, 2002, Growth opportunities and corporate debt policy: the case of the US defense industry, *Journal of Financial Economics* 64, 35-59.

Graham, J.R., M. L. Lemmon, and J.S. Schallheim, 1998, Debt, leases, taxes, and the endogeneity of corporate tax status, *Journal of Finance* 53, 131-162.

Grinblat, M. and S. Titman, 1998, *Financial markets and corporate strategy*, McGraw Hill : Boston.

Grossman, S. and O. Hart, 1980, Takeover bids, the free-rider problem and the theory of corporation, *Bell Journal of Economics* 11, 42-64.

Grossman, S. and O. Hart, 1986, The costs and benefits of ownership: A theory of vertical and lateral integration, *Journal of Political Economy* 94, 691-719.

Guedes, J. and T. Opler, 1996, The determinants of the maturity of corporate debt issues, *Journal of Finance* 51, 1809-1833.

Gugler, K., 2001, *Corporate governance and economic performance*, Oxford University Press : Oxford.

Gugler, K., 2003, Corporate governance, dividend payout policy, and the interrelation between dividends, R7D, and capital investment, *Journal of Banking and Finance* 27, 1297-1321.

Gutierrez, R. and D.M. Drukker, 2004, Which references should I cite when using the cluster option to obtain Stata's cluster-correlated robust estimate of variance?, Stata FAQ.

Hair, J.F., R.E. Anderson, R.L. Latham and W.C. Black, 1995, *Multivariate data analysis*, Prentice Hall: New Jersey

Harris, D. and C. Helfat, 1997, Specificity of CEO human capital and compensation, *Strategic Management Journal* 18, 895-920.

Harris, M and A. Raviv, 1988, Corporate governance: voting rights and majority rules, *Journal of Financial Economics* 20, 203-235.

Harris, M., and A. Raviv, 1991, The theory of capital structure, *Journal of Finance* 46, 297-355.

Hart, O., 2001, Financial contracting, *Journal of Economic Literature* 39, 1079-1100.

Hart, O., and J. Moore, 1990, Property right and the nature of the firm, *Journal of Political Economy* 98, 1119-1158

Hart, O., and J. Moore, 1998, Default and renegotiation: A dynamic model of debt, *Quarterly Journal of Economic* 113, 1-41

Heaney, R., and M. Holmen, M., 2004, Portfolio diversification and the cost of control, Uppsala University Working Paper.

Holderness, C.G., 2003, A survey of blockholders and corporate control, *Economic Policy Review* 9, 51-63.

Holderness, C.G. and D. Sheehan, 1985, Raiders or saviors? The evidence on six controversial investors, *Journal of Financial Economics* 14, 555-579

Holderness, C.G. and D. Sheehan, 1988, The role of majority shareholders in publicly held corporations, *Journal of Financial Economics* 20, 317-346.

Howard, P. and R. Brown, 1992, Dividend policy and capital structure under the imputation tax system: Some clarifying comments, *Accounting and Finance* 32, 51-61.

Huang, S.G.H. and F.M. Song, 2002, The determinants of capital structure: Evidence from China, Working Paper, The University of Hongkong

Huber, P. J. 1967, The behavior of maximum likelihood estimates under nonstandard conditions. In *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability*. Berkeley, CA: University of California Press, vol. 1, 221–223.

Imhoff, E.A., R.C. Lipe and D.W. Wright, 1991, Operating lease: Impact of constructive capitalization, *Accounting Horizons* 5, 51-63

Imhoff, E.A., R.C. Lipe and D.W. Wright, 1997, Operating lease: Income effects of constructive capitalization, *Accounting Horizons* 11, 12-32

Jensen, M., 1983, Organization Theory and Methodology, *The Accounting Review* 57, 319-339.

Jensen, M., 1986, Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323-329.

Jensen, M. and W. Meckling, 1976, Theory of the firm: Managerial behaviour, agency costs, and ownership structure, *Journal of Financial Economics* 3, 305-360.

Jensen, G., D. Solberg, T.S. Zorn, 1992, Simultaneous determination of insider ownership, debt, and dividend policy. *Journal of Financial and Quantitative Analysis* 27, 247-263.

Johnson, S.A., 2003, Debt maturity and the effects of growth opportunities and liquidity risk on leverage, *Review of Financial Studies* 16, 209-236.

Kennedy, P., 2003. *A Guide to Econometrics*, Blackwell Publishing, Oxford.

Kerlinger, F.N., 1986, *Foundations of Behavioral Research*, New York: Holt, Rinehart and Winston

Kester, W.C. and T.A. Luehrman, 1995, Rehabilitating the leveraged buyout, *Harvard Business Review* (May-June), 119-130.

Kim, W. and E. Sorensen, 1986, Evidence on the impact of agency costs of debt on corporate debt policy, *Journal of Financial and Quantitative Analysis* 21, 131-144.

Klein, B., R. Crawford and A. Alchian, 1978, Vertical integration, appropriable rents, and the competitive contracting process, *Journal of Law and Economics* 21, 297-326.

Klein, L.S., T.J. O'Brien and S.R. Peters, 2002, Debt vs equity and asymmetric information: A review, *The Financial Review* 37, 317-350.

Kole, S. R., 1997, The complexity of compensation contracts, *Journal of Financial Economics* 43, 791-104.

Krishnan, V. and R.C. Moyer, 1994, Bankruptcy costs and the financial leasing decisions, *Financial Management* 23, 31-42.

Lamba, A. and G. Stapledon, 2001, The determinants of corporate ownership structure: Australian evidence, Working Paper No. 20, Faculty of Law, The University of Melbourne.

Lang, L. and R. Stultz, 1994, Tobin Q, corporate diversification, and firm performance, *Journal of Political Economy* 102, 1248-1280.

LaPorta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 1998, Law and finance, *Journal of Political Economy* 106, 1113-1155.

LaPorta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 1999, Corporate ownership around the world, *Journal of Finance* 54, 471-518.

Leland, H.E. and K.B. Toft, 1996, Optimal capital structure, endogeneous bankruptcy, and the term structure of credit spread, *Journal of Finance* 51, 987-1019.

Lins, K, 2003, Equity ownership and firm value in emerging markets, Journal *of Financial and Quantitative Analysis* 38, 159-184.

Loderer, C. and D. Sheehan, 1989, Corporate bankruptcy and managers' self-serving behavior, *Journal of Finance* 44, 1059-1075.

Masulis, R.W., 1988, *The debt/equity choice*, Ballinger Pub. Co: Cambridge

Mayer, C., 2001, Firm control in *Corporate governance: Essay in honor of Horst Albach*. J. Schwakbach (ed), Springer.

Mayers, D. and C.W. Smith, 1990, On the corporate demand for insurance: Evidence from the reinsurance markets, *Journal of Business* 63, 19-40.

McConaughy, D.L., Mc. Walker, G.V. Henderson and C.S. Mishra, 1998, Founding family controlled firms: Efficiency and value, *Review of Financial Economics* 7, 1-19.

Mehran, H., 1992, Executive incentive plans, corporate control and capital structure. *Journal of Financial and Quantitative Analysis* 27, 539-560.

Mehran, H., R.A. Taggart, and D. Yermack, 1999, CEO ownership, leasing and debt financing, *Financial Management*

Milgrom, P. and J. Roberts, 1990, Barganing costs, influence costs and the organization of economic activities. In Alt, J. and K. Shepsle (eds), *Perspectives on Positive Political Economy*, Cambridge: Cambridge University Press

Milgrom, P. and J. Roberts, 1992, *Economics, Organization and Management*, New Jersey, Prentice Hall.

Miller, M., 1988, The Modigliani-Miller propositions after thirty years, *Journal of Economic Perspectives* 2, 99-120.

Mishra, C. S. and D. L. McConaughy, 1999, Founding family control and capital structure: The risk of loss of control and the aversion to debt, *Entrepreneurship Theory and Practice* (Summer), 53-64.

Modigliani, F. and M. Miler, 1958, The cost of capital, corporation finance, and the theory of investment, *American Economic Review* 48, 261-297.

Monsen, R. J. and A. Downs, 1965, A theory of large managerial firms, *Journal of Political Economy* 73: 221-236.

Morck, R. A. Shleifer, and R.W. Vishny, 1988, Management ownership and market valuation: An empirical analysis, *Journal of Financial Economics* 20, 293-315.

Morck, R., and B. Yeung, 2003, Agency problems in large family business groups. *Entrepreneurship Theory and Practice* (Summer), 367-382.

Morck, R. and B. Yeung, 2004, Special issues relating to corporate governance and family control, World Bank Policy Research Working Paper 3406

Mroczkowski, N., and G.A. Tanewski, 2005, Delineating publicly listed family and non-family controlled firms: An approach for capital markets research in Australia. *Journal of Small Business Management* (forthcoming)

Muller, E., 2004, Underdiversification in private companies – required returns and incentive effects, ZEW Discussion Paper No. 04-29.

Mukherjee, T. K., 1991, A survey of corporate leasing analysis, *Financial Management* (Autumm), 96-107.

Myers, S., 1977, Determinants of corporate borrowing, *Journal of Financial Economics* 5, 147-175.

Myers, S., 1984, The capital structure puzzle, *Journal of Finance* 39, 575-592.

Myers, S., 2001, Capital structure, *Journal of Economic Perspectives* 15, 81-102.

Myers,S., 2003, Financing of corporations. In Constantinides, G.M., M. Harris, R.M. Stultz (Ed), *Handbook of the economics of finance*, Elsevier, Amsterdam, pp. 215-253.

Myers, S. and N. Majluf, 1984, Corporate financing and investment decision when firms have information that investors do not have, *Journal of Financial Economics* 13, 187-221

Nenova, T., 2003, The value of corporate voting rights and control: A cross-country analysis, *Journal of Financial Economics* 68, 325-351.

Ogden, J.P., F.C. Jen and P.F. O'Connor, 2003, *Advanced corporate finance: policies and strategies*, Prentice Hall: Upper Saddle River, N.J.

Palia, D., Ravid, S.A., 2002, The role of founders in large companies: Entrenchment or valuable human capital?, Rudgers University Working Paper.

Peirson, G., R. Brown, S. Easton, and P. Howard, 2002, *Business Finance*, McGraw Hill: Sydney.

Pettit, R.R. and R.F. Singer, 1985, Small business finance: A research agenda, *Financial Management* 14, 47-60.

Pham, P.K., 2003, Ownership structure of newly listed corporations, Unpublished PhD Dissertation, Department of Accounting and Finance, Monash University

Pham, T. and D. Chow, 1987, Some estimates if direct and indirect bankruptcy cost in Australia : September 1978-May 1983, *Australian Journal of Management* (June), 75-95.

Pollak, R., 1985, A transaction cost approach to families and household, *Journal of Economic Literature* 23, 581-608.

Poutziouris, P., S. Sitorus, and F. Chittenden, 2002, The Financial Affairs of Family Companies. Manchester Business School.

Rajan, R.G., and L. Zingales, 1995, What do we know about capital structure? Some evidence from international data, *Journal of Finance* 50, 1421-1460.

Robertson D. K. and R. B. Tress, 1985, Bankruptcy costs : Evidence from small-firms liquidation, *Australian Journal of Management* (June), 49-60

Romano, R., 1993, Public pension fund activism in corporate governance reconsidered, *Columbian Law Review* 93, 795-853.

Ross, S., 1977, The determination of financial structure: The incentive signalling approach, *Bell Journal of Economics* 8, 23-40.

Ryan, B., R.W. Scapens, and M. Theobald, 1992, *Research methods and methodology in finance and accounting*, Academic Press : London

Schallheim, J.S., 1994, *Lease or buy: Principles for sound decision making*, Harvard Business School Press: Boston.

Scherr, F.C. and H.M. Hulburt, 2001, The debt maturity of small firms, *Financial Management* (Spring), 85-111.

Schulze, W.S., M.H. Lubatkin, R.N. Dino, 2001, Agency relationship in family firms: Theory and evidence, *Organizational Science* 12, 99-116.

Sharpe, S.A., 1991, Credit rationing, concessionary lending, and debt maturity, *Journal of Banking and Finance* 15, 581-604.

Sharpe, S.A. and H.H. Nguyen, 1995, Capital markets imperfections and the incentive to lease. *Journal of Financial Economics* 39, 271-294.

Shleifer, A. and R. Vishny, 1986, Large shareholders and corporate control, *Journal of Political Economy* 95, 461-488.

Short, H., 1994, Ownership, control, financial structure and performance of firms, *Journal of Economic Surveys* 8, 203-249.

Smith, C. W., 1986, Investment banking and the capital acquisition process, *Journal of Financial Economics* 15: 3-29.

Smith, C.W., 1990, The theory of corporate finance: A historical overview, in *The modern theory of corporate finance*, Smith, C.W. (ed), McGraw-Hill : New York.

Smith, B.F. and B. Amoako-Adu, 1999, Management succession and financial performance of family controlled firms, *Journal of Corporate Finance* 5, 341-368.

Smith, C.W. and M. Wakeman, 1985, Determinants of corporate leasing policy, *Journal of Finance* 40, 895-908.

Smith, C.W. and J.B. Warner, 1979, On financial contracting: An analysis of bond covenants, *Journal of Financial Economics* 7, 117-161.

Smith, C.W. and R.L. Watts, 1992, The investment opportunity ser and corporate financing, dividend and compensation policy, *Journal of Financial Economics* 32, 263-292.

Stapledon, G., 1996, *Institutional shareholders and corporate governance*, Oxford University Press: Oxford.

Steier, L., 2003, Variants of agency contracts in family-financed ventures as a continuum of familiar altruistic and market rationalities, *Journal of Business Venturing* 18, 597-618.

Stiglitz, J., 1974, On the irrelevance of corporate financial policy, *American Economic Review* 64, 851-866.

Stock, J. and M.W. Watson, 2003, *Introduction to Econometrics*, Addison Wesley: Boston

Stohs, M.H. and D.C. Mauer, 1996, The determinants of corporate debt maturity structure *Journal of Business* 69, 279-312.

Stultz, R., 1988, Managerial control of voting rights: Financing policies and the market for corporate control, *Journal of Financial Economics* 20, 25-54

Stultz, R. and H. Johnson, 1985, An analysis of secured debt, *Journal of Financial Economics* 14, 501-521.

Sutton, R. and A. Callahan, 1987, The stigma of bankruptcy: Spoiled organizational image and its management, *Academy of Management Journal* 30, 405-436.

Taylor, S., and G. Whittered, 1997, Security design and the allocation of voting rights: Evidence from the Australian IPO market, *Journal of Corporate Finance* 4, 107-131.

Titman, S., 1992, Interest rate swaps and corporate financing choices, *Journal of Finance* 47, 1503-1516.

Titman, S., and R. Wessels, 1988, The determinants of capital structure choice, *Journal of Finance* 43, 1-19.

Treynor, J.L. and F. Black, 1976, Corporate investment decision in S.C. Myers (ed), *Modern development in financial management*, Praeger Publishers : New York.

Tufano, P., 1996, Who manages risk? An empirical examination of risk management practices in the gold mining industry, *Journal of Finance* 51, 1097-1137.

Twite, G., 2001, Capital Structure choices and taxes: Evidence from the Australian dividend imputation tax system, *International Review of Finance* 2, 217-234.

Verbeek, M., 2004, *A guide to modern econometric*, John Wiley and Sons: London.

Villalonga, B. and R. Amit, 2004, How Do Family Ownership, Control, and Management Affect Firm Value?, Working Paper Harvard Business School.

Warner, J. B., 1977, Bankruptcy costs: Some evidence, *Journal of Finance* 32, 337-368.

White, H., 1980, A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity, *Econometrica* 48, 817–830.

Whited, T.M., 1992, Debt, liquidity constraints, and corporate investment: Evidence from panel data, *Journal of Finance* 47, 1425-1260.

Williamson, O. E., 1975, *Markets and Hierarchies: Analysis and Antitrust Implications*, Free Press: New York.

Williamson, O. E., 1985, *The Economic Institutions of Capitalism*, Free Press: New York.

Wiwattanakantang, Y., 1999, An empirical study on the determinants of the capital structure of Thai firms, *Pacific Basin Finance Journal* 7, 371-403.

Wooldridge, J.M., 2000, *Introductory econometrics: A modern approach*, South-Western College Publishing

Zingales, L., 1998, Corporate governance in *The new Palgrave dictionary of economics and law*, P. Newman (ed). London, Macmillan.

Zingales, L., 2000, In search of new foundations, *Journal of Finance* 60, 1623-1653.