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Sun Zi's Art of Corporate Finance: How are Corporate Financial Policies Derived and Determined?

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ABSTRACT

This dissertation examines how Australian firms determine their capital structure. Using a sample of Australian Initial Public Offering (IPO) firms between the period of 1993 and 2005, the analysis demonstrates that Australian IPO firms are opportunists (consistent with the window of opportunity theory of Taggart, 1977). Australian "hot" market firms tend to take advantage of favourable market conditions to issue more equity during their IPO year than their "cold" market counterparts. Such behaviour appears consistent with a market timing strategy.

While Australian firms time the market, there is no evidence that market timing has a long-run impact on firms' capital structure. On the contrary, Australian IPOs also raise debt financing during their year of going public which contradicts with the predictions by the market timing hypothesis. This dissertation finds that the strategy of timing the market is consistent with firms having a long-run target for their capital structure: opportunities to raise cheaper capital are exploited in order to achieve a target debt/equity ratio at the lowest overall cost of capital. Such behaviour is opportunistic but behind it is an overarching strategy to reach a target leverage ratio. Managers take advantage of opportunities to raise external funds but they do not let such opportunities tempt them to stray from their long-run target.

The use of IPO sample data may be bias towards finding a presence for market timing behaviour. This dissertation therefore, extends the analysis to examine how firms determine their capital structure using a data set of all listed Australian companies (IPOs included) from 1993 to 2005. Leverage deficit and financial deficit variables are

included to further test the explanatory power of competing theories of capital structure. The analysis from the extended tests confirms the findings from the analysis of IPO firms: Australian firms appear to have a leverage target. However, they take advantage of characteristics which facilitate reaching these targets. Issuers issue debt when they are profitable. When firms are profitable and perform well in the market, they will issue both debt and equity. Such opportunistic behaviour is inconsistent with the pecking order theory.

This dissertation aims to advance our understanding of the capital structure decisions of Australian listed companies and provide an extension to the important ongoing arguments on the dynamics of financing decisions. This dissertation also provides further insights into the corporate finance literature on the existence of target capital structure. Finally, by understanding how Australian firms determine and derive their financial policies, the results may be useful for corporate financial managers (who may be interested in the optimal timing of issues), institutional and retail investors (who may be interested in return behaviour and avoid investing during the "hot" period as the share prices are likely to be overpriced) and regulators (as the opportunistic behaviour of Australian firms may impinge on the efficiency and operation of the capital markets in Australia).

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"Challenge - When the difficult things are attempted you can achieve the impossible"

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Table Of Contents

List Of Tables

List Of Figures

List of Appendices

Chapter One
Introduction

"The ability to subdue the enemy without any battle is the ultimate reflection of the most supreme strategy"- Sun Zi[1]

[1.1] Research Motivation & Objectives

Written in 400-320 B.C, Sun Zi's "Art of War" is the oldest known military classic in Chinese literature. In one of the chapters, Sun Zi argued that, "*the ability to subdue the enemy without any battle is the ultimate reflection of the most supreme strategy"*. This reflects the importance and the benefit of strategic planning: a premeditated move to obtain an objective with minimal (or no) use of resources.

In planning strategies, "*the wise general in his deliberations must consider both favourable and unfavourable factors"*.[2] In business, as in war, the wise manager will formulate strategies which consider both favourable and unfavourable business conditions. If the external factors are favourable, managers should exploit them to increase the wealth of their shareholders and, or, their own wealth. If there are unfavourable trends, managers must act to minimise negative impacts.[3]

[1] Wee (2003), page 59.
[2] Griffith (1971), page 113.
[3] See Foo and Grinyer (2000) for a discussion on organising business strategies.

In corporate finance, shaping a firm's capital structure is one of the most important strategic decisions a firm must make. Given that the choice of financing mechanisms (the use of internal funds, equity raising or debt issuance) plays a major part in determining this structure, any decisions made should aim to maximize the wealth of the firms. Therefore, when deciding on a capital structure policy, managers following Sun Zi's advice should exploit favourable factors and minimise the effects of unfavourable influences. In raising external financing for example, managers may decide when would be the most advantageous time to raise equity rather than debt.

The seminal paper by Modigliani and Miller (1958) (MM) concerning capital structure irrelevance identifies circumstances where corporate financing decisions do not matter. However, subsequent research can be interpreted as attempts to identify those assumptions in the MM theorems that are violated in practice and give a potential role in capital structure in maximizing shareholders' wealth. Several important capital structure theories such as trade-off, pecking order, signalling, agency and market timing[4] have since been developed to explain managers' financing choices. However, the existing empirical evidence on capital structure is mixed, leaving one of the central questions of corporate finance unanswered: *what determines the financing decision of a company?*

A reason for the absence of a completely satisfying answer to the question of what determines the financing decision is that a number of the theories share the same predictions. The pecking order and market timing hypotheses for example, imply that

[4] See Chapter 2 - "Literature review on capital structure", for the discussion of the various capital structure theories.

firms issue equity when they perform well in the market. Therefore, any analysis which finds that equity issuance is associated with good performance still leaves the question of which theory best explains the data unanswered.

Another reason why the question of what determines the financing decision cannot be fully answered is that if managers really have a strategic plan to increase the firms' value at the minimal cost, they are likely to utilise as many available favourable elements as possible to help them to achieve their objective. If this is the case, empirical evidence is likely to be mixed with the managers acting opportunistically; short-term behaviours may be explained by various capital structure theories.

Given that past research is unable to draw a consistent picture to explain the managers' choice of financing, the aim of this dissertation is to test the capital structure of firms in a setting where competing theories of capital structure do not share the same predictions and to discriminate between predictions made by competing capital structure theories. Furthermore, while there is a rich body of research in the America that studied the various theories of capital structure, Australian studies are mainly concentrated on trade-off and pecking order theories. If opportunism plays a role in decision making, the classical theories of trade-off and pecking order are unlikely to fully explain Australian firms' behaviour.

The Australian regulatory system is close to that of the United States (US) (La Porta *et al.,* 1998). Recent analysis has indicated that the Australian capital market functions as

if it is simply an offshore branch of the American market (Durand *et al.*, 2006).[5] Moreover, Fan *et al.* (2004) demonstrate that American and Australian firms have similar capital structures. Such integration and similarity in the capital structure of firms suggests that the markets' responses to corporate events may be similar in both America and Australia. Therefore, the use of Australian data offers a potentially instructive "hold-out" sample to critically appraise the findings in American studies.

This dissertation advances our understanding of capital structure decisions by Australian listed companies and also provides evidence which will assist with consideration of this issue when examining capital structure decisions in other economies.

[1.2] Outline Of The Dissertation & Overview Of Findings

Chapter 2 provides an overview of the extant literature in the area of capital structure. It will first outline the theories of capital structure: trade-off theory, Myers and Majluf's (1984) pecking order theory, Taggart's (1977) window of opportunism (i.e. Market timing), Ross's (1977) signalling effect and Jensen's (1986) agency theory. The chapter then presents the empirical findings of the determinants of capital structure choice advanced by Titman and Wessels (1988) and Rajan and Zingales (1995) who suggest that asset tangibility, non-debt tax shield, growth opportunities, uniqueness and industry classification, size of firm, earnings volatility (risk) and profitability are the common determinants. The hypotheses of the determinants of leverage are then developed from the review of the literature. These hypotheses provide testable propositions for the

[5] See Chapter 2 - "Literature review on capital structure", for further discussion.

various theories of capital structure. Finally, an outline of empirical evidence of capital structure theories is discussed. The evidence suggests the existence of mixed and inconsistent inferences which have been drawn in previous studies, leaving the central questions of "*what determines the financing decision of a company?"* unanswered.

Chapter 3 describes the methodology and the data set employed in this dissertation. It provides a detailed explanation of the experimental design and its unique approach. In particular, this dissertation tests the competing theories of capital structure in a setting whereby these theories do not share the same predictions. This dissertation first examines the impact of market timing hypothesis on the Australian Initial Public Offering (IPO) firms. Classifying the IPO firms into various types of issuers (i.e. dual, debt, equity and non issuers), the dissertation then examines the determinants and choice of firm leverage (see Chapter 4 - "Capital Structure and The Use of Market Timing", for a full discussion on the findings). Subsequently, to avoid bias towards finding supports for market timing hypothesis due to the use of IPO data, the dissertation extends the sample data to include all other listed firms. This extended sample data is also classified into various types of issuers to examine the determinants and the choice of firm leverage (see Chapter 5 - "Opportunism and Target Leverage", for a full discussion on the findings).

The approach of classifying the sample data into various types of issuers (i.e., dual, debt, equity and non issuers) allows discrimination between predictions made by the competing capital structure theories and disentangles how competing theories of capital structure can explain the observed leverage. Furthermore, in order to ensure that the

inferences obtained in this dissertation are robust, a range of other techniques is also employed to ensure that the conclusions drawn from the various statistical techniques are robust (see Chapter 6 - "Robustness Tests", for a full discussion of these findings).

The data sources and the definition and formation of the variables for the regression are then described in Chapter 3. In particular, this dissertation uses firms listed on the Australian Securities Exchange (ASX).

The analysis of the methodology employed in this dissertation is conducted in Chapter 4. Using the IPO firms to isolate timing attempts, the preliminary analysis provides evidence for market timing strategy where "hot" market[6] firms will take advantage of market conditions to issue more equity as predicted by the market timing hypothesis. However, while some characteristics of market timing strategy are observed, there is also a high net debt issue in the IPO year which is at odds with the predictions of the market timing hypothesis. Finding that dual issuers (i.e. companies which issue equity and debt concurrently in the same financial year) are common, further empirical tests are conducted to explore the determinants of firm leverage to disentangle how competing capital structure theories (especially the market timing hypothesis) can explain the observed leverage. The analysis demonstrates that Australian firms are indeed opportunistic fund raisers but that their behaviour is consistent with them having a target debt ratio. These targets are consistent with these firms trading-off the costs and the benefits of debt *versus* equity. The analysis rejects pecking order theory and confirms

[6] See Chapter 2 - "Literature review on capital structure", for further discussion on the definition of "hot" market.

that market timing strategy is a "means to the end" of achieving a target leverage structure. Market timing strategy is not an end in itself.

As the empirical tests in Chapter 4 use only a sample of IPO firms, the dissertation extends the analysis in Chapter 5 by analysing both IPO and listed firms to explore the capital structure of Australian firms. Using the sample of both IPO and listed firms will allow this dissertation to confirm which theories of capital structure best explain the capital structure of Australian firms. Separating the data into the four groups of issuers (issuers of debt, equity, dual issuers and firms that do not issue debt or equity), the determinants of firm leverage are first analysed to see how various theories of capital structure can explain the determinants' relationship with the leverage. A target leverage proxy for each firm-year observation is also derived to study whether or not Australian firms have a long term target capital structure. The determinants of the type of financing are then analysed to provide an understanding as to why and when firms choose to use external financing. Consistent with the findings in Chapter 4, the analysis of Australian companies in Chapter 5 confirms that firms behave opportunistically when raising funds. Managers seize the moment to exploit firm characteristics which facilitate a particular capital-raising strategy at a particular time. In the long run however, firms appear to have a target debt ratio which is determined by various trade-offs between the costs and the benefits of debt *versus* equity. Therefore, managers act opportunistically to achieve strategic goals.

Chapter 6 provides a series of robustness checks on the inferences obtained from the empirical tests in Chapters 4 and 5. Firstly, control for possible correlations between

annual data[7] of the firm-year observations is made. Secondly, a panel (unbalance) analysis is conducted to control for the heterogeneity of the data. The results obtained from the above are consistent with the results presented in Chapters 4 and 5. Lastly, Chapter 7 presents the conclusion to this dissertation and directions for future research.

[1.3] Contributions Of This Dissertation

This dissertation contributes to the literature in four ways. Firstly, academics have investigated various capital structure theories in a number of different institutional settings (e.g. America and Australia). Given well-documented evidence that the Australian capital market functions as if it is simply an offshore branch of the American market, evidence found in American studies should also apply to firms in the Australian market. Hence, the use of Australian data offers a potentially instructive "hold-out" sample to critically appraise the findings in American studies.

Overall, the findings presented in this dissertation are consistent with some American studies such as Alti (2006), Kayhan and Titman (2007) and Huang and Ritter (2007).[8] Over time, Australian firms tend to move towards their target debt ratio which is consistent with the trade-off theories of capital structure.

There are however, some findings presented in this dissertation which suggest the uniqueness of the Australian capital market. When examining the impact of market timing strategies, Alti (2006) for example, finds that for the US IPO firms, the public

[7] See Chapter 3 - "Methodology and Data" for a discussion on the formation of the variables.
[8] See Chapter 2 - "Literature review on capital structure", for further discussion on these studies.

firms (especially the "hot" market firms as compared to the "cold" market firms) have less leverage at the end of their IPO year. This dissertation in contrast, finds that Australian IPO firms (both "hot" and "cold" market firms) increase their leverage by the end of their IPO year. This appears to be consistent with the relatively smaller capital market in Australia compared to that of the US: Australian IPO firms will need to tap into both equity and debt markets in order to raise their required funds. Australian firms do however, behave opportunistically when raising funds to exploit favourable market conditions (i.e. raising more equity during the "hot" market period).

Such findings also suggest that the findings in American studies can not be used to fully explain the capital structure policies of other economies or at least Australian firms as presented in this dissertation.

Secondly, given that the existing empirical evidence on capital structure is mixed due to the overlapping of predictions shared by various capital theories, this dissertation uses a methodology which is able to discriminate between predictions made by competing capital structure theories. This enables us to disentangle the various alternative theories of capital structure and draws an inference on the best theory which explains Australian firms' capital structure. In particular, by classifying the sample data into the various types of issuers (i.e. dual, debt, equity and non issuers) and examining the determinants and choice of firm leverage, this dissertation is able to isolate the market timing effect and finds that in long run, Australian firms appear to have a target debt ratio which is determined by various trade-offs between the costs and the benefits of debt *versus* equity.

Thirdly, this dissertation provides an Australian empirical investigation of competing theories of capital structure by considering the impact of market timing on capital structure directly where no Australian study has done in the past. Previous Australian studies tended to only seek an explanation for a firm's capital structure decision from the classical theories of trade-off and pecking order. Most of the past Australian studies concluded that the pecking order theory is best to explain Australian firms' capital structure. Recent evidence in the US however, questions pecking order's ability to explain firms' capital structure. Frank and Goyal (2003) for example, find that evidence supporting the pecking order theory declines over time because equity becomes more important. Fama and French (2005) find that most firms issue or retire equity each year and the issues are on average large and not typically done by firms under duress, which contradicts the predictions made by the pecking order theory. The explanatory power therefore, of the pecking order theory in the Australian context has to be re-investigated as alternative theories of capital structure may best explain Australian firms' capital structure. Furthermore, with the increasing empirical findings in the US which support the existence of a market timing hypothesis, the impact of this hypothesis should be taken into account for a proper investigation on how Australian firms derive their capital structure.

Contrary to previous Australian studies, the findings of this dissertation conclude that the pecking order theory cannot explain the capital structure of Australian firms. A long-term target leverage level instead, is set. This finding suggests that previous Australian findings may be the result of restricted methodologies providing restricted and mixed conclusions due to the overlapping of predictions shared by various capital theories.

More importantly, this dissertation provides evidence that Australian managers act opportunistically. While the optimal long-term financing policy is to maintain a target leverage (which is dictated by the cost and the benefit of the use of debt), the findings of other capital structure theories (other than the trade-off theory) is a means to achieve the optimal corporate financial policy.

Finally, by understanding how Australian firms determine and derive their optimal financial policies, the findings in this dissertation may be useful to corporate financial managers who may be interested in the optimal timing of issues of debt, equity or a combination of both. It may also be useful to institutional and retail investors who may be interested in return behaviour: if Australian managers utilise the optimal timing to issue equities, then investors with longer term holding strategy should avoid investing during the "hot" period as the share prices are likely to be overpriced. Lastly, regulators may also be interested in the findings as the opportunistic behaviour of Australian firms may impinge on the efficiency and operation of the capital markets in Australia. Therefore, this dissertation presents an advancement in our understanding of the capital structure decisions made by Australian listed companies.

Chapter Two
Literature Review on Capital Structure

[2.1] Introduction

There are many methods used by firms to raise their required funds. The most basic and important instruments are equities such as shares or debts such as bonds; the firm's mix of different securities is known as its *capital structure*. A natural question then arises: *what is the optimal debt-equity ratio?*

For many years, academics have examined the determinants of companies' financial policy decisions. The mysteries of the effect of corporate financial policy decisions – financing, dividend and investment decisions were explored as early as 1897 and 1910 by Greene[1] and Meade[2] respectively. Greene (1897) and Mead (1910) approached the subject from a descriptive and legalistic theory which focused on the major events in the life cycle of a corporation, such as the issuance of securities, mergers and combinations and failure through bankruptcy. However, it was the seminal work on capital structure by Modigliani and Miller in the late 1950s which fuelled the "modern" literature of corporate finance. They were also the first to address the capital structure issue in a scientific way.

[1] Greene wrote the earliest American corporate finance text which was meant to be a manual for practitioners.
[2] The 1910 Mead Book represented noted from Mead's lectures at Harvard University between 1907 and 1908.

In this chapter, the modern theories of capital structure will first be discussed in Section 2.2. The section revisits the influential works by Modigliani and Miller (1958, 1961 and 1963) and outlines the important implications of financing decisions of a company on its valuation. Since the work by Modigliani and Miller, many studies have researched the relative amount of debt versus equity a firm should take. Many theoretical explanations have been derived to predict and explain the decision and these theories namely: trade-off theory, pecking order theory, market timing theory, signalling theory and agency theory, are outlined in Section 2.3.

Section 2.4 summarises the various empirical studies which examine the determinants of leverage. These studies are important to the theories of capital structure as they provide the estimation of the impact of unobservable attributes on the choice of corporate debt ratios. Such estimation provides the empirical measurements to explore the various theoretical explanations and allow us to explore the theories of trade-off, pecking order, market timing, signalling and agency. The various hypotheses on these determinants predicted by the various theories of capital structure are also reviewed in Section 2.4. In particular, the discussion of these various hypotheses highlights one of the difficulties research relating to capital structure often encounter: many of the predictions of the various theories are similar. Such similar predictions among various theories made it difficult for researchers to explore the determinants of firm leverage to disentangle how competing capital structure theories can explain those determinants' relationship with the leverage.

In Section 2.5, previous earlier empirical studies which investigated the question on how much leverage a firm should take on and why are first discussed. Subsequently, the section highlights how recent studies provide evidence which contradict the earlier findings are then outlined. Finally, Section 2.6 concludes the chapter.

[2.2] Modigliani And Miller's Propositions

Modigliani and Miller (1958) (MM) demonstrate that in a perfect capital market, the financing decisions made by a company have no implications for its valuation and hence are irrelevant. MM's proposition 1 states that the market value of a firm is unaffected by its financing decisions, its capital structure or its debt-equity ratio. MM (in their simple world where there is no friction) view the value of the company as a whole pie. The size of the pie does not depend on how it is sliced (the firm's capital structure) but rather the size of the pie pan (the firm's present value based on its future cash flows and its asset base). MM's proposition 2 on the other hand, states that although any increase in leverage raises both the risk of equity and its required return, the wealth of equity holders is unaffected. This is because, in a world with no taxes, the weighted average cost of capital for a levered firm is equal to the cost of capital for an all-equity firm.[3] Equity holders therefore, should be indifferent to capital structure and to change in leverage.

[3] The cost of equity depends on the following three variables:
(a) The required rate of return on the firm (r_a);
(b) The required rate of return on the firm's debt (r_d); and
(c) The firm's debt/equity ratio (*D/E*). $r_e = r_a + \frac{D}{E}(r_a - r_d)$

However, MM's propositions[4] present a theory which is only valid under certain conditions. If the theory is far from true, so are the conditions. In the real world, capital structure *may* matter as market imperfections do exist. In particular, in an imperfect world where market frictions exist, firms are taxed for the earnings (after interest payments) they make. Such market imperfection may affect the capital structure of a firm; firms may prefer debt over equity because of the tax deductibility of debts. Hence, when adding corporate taxes into MM's propositions, the market value of a levered firm equals the market value of an unlevered firm plus the present value of interest tax shields (Modigliani and Miller, 1963). Therefore, the implication of the model with corporate taxes is that the value of the firm is maximized when it is financed entirely by debt; the optimal financing policy is to finance 100% by debt.

There is however, one very important real world constraint that needs to be considered. Failure to meet debt obligations can result in bankruptcy[5] and the costs imposed for going bankrupt might influence the firm's management not to increase the debt-equity ratio too high.

[4] MM's Proposition III establishes that firm market value is independent of its dividend policy (Modigliani and Miller, 1961) in a perfect market. This irrelevance of dividend policy argument was later extended by Black (1976) whom wrote in the closing of his well-known paper on "The Dividend Puzzle": *"What should the corporation do about dividend policy? We do not know"*. Black (1976) argued that in a world where dividends are taxed more heavily than capital-gains, and where capital-gains are not taxed until realized, a firm that pays no dividends will be more attractive to taxable individual investors than a similar firm that pays dividends. Such attractiveness will tend to increase the price of the non-dividend-paying firm's share. However, Black (1976) observes that corporations are still paying out.

[5] In this dissertation, I use the word "bankruptcy" loosely. In Australian business context, the term "bankruptcy" is an insolvency procedure that applies to a natural person, not to a company. Failing Australian corporations may undergo liquidation (court, creditors' voluntary or members' voluntary) or voluntary administration.

Nonetheless, the presence of market imperfections does not necessary mean that MM's theory is useless. Rather, an understanding of the MM's theory assists academics to understand the conditions assumed for the propositions to hold. Miller (1977) for example, re-asserted that in equilibrium, the value of a levered firm equals the value of an unlevered firm and hence the propositions still hold. More importantly, the theory tells us what kinds of market imperfection we need to look for and pay attention to when deciding on the mixture of securities to form a firm's capital structure.

[2.3] Theories Of Capital Structure

The MM theorem opens a new literature on the fundamental nature of debt versus equity and how the presence of market imperfections may affect the capital structure of a firm. Since the articulation of the MM theorem, many theories of capital structure have been developed to offer explanations on a firm's choice of capital structure. The following sections will outline the five most commonly cited theories in the capital structure literature namely, trade-off theory (in Section 2.3.1), pecking order theory (in Section 2.3.2), market timing (in Section 2.3.3), signalling theory (in Section 2.3.4) and agency theory (in Section 2.3.5).

[2.3.1] Trade-Off Theory

The trade-off perspective is the oldest theory and is immediately linked to insights from Modigliani and Miller on capital structure. It envisages that the managers try to sustain an optimal target capital structure and will substitute debt for equity, or equity for debt,

until the value of the firm is maximised. It also predicts that firms identify their optimal leverage by weighing the costs and the benefits of an additional dollar of debt. Random events however, within or outside the firm may temporarily shift the firm away from its optimal target. Assuming that the target capital structure is stable, one would expect to see mean reverting behaviour with regard to the debt/equity mix. Nonetheless, the level of debt ratio is not driven by the need for external funds but is the result of trying to obtain the optimal level of debt.

The benefits of debt include the tax deductibility of interest and the reduction of the free cash flow problem: (1) Modigliani and Miller proposition I (with corporate taxes) suggests that the value of a leveraged firm exceeds the value of an un-leveraged firm by the present value of the interest tax shield. This is because interest on debt is tax deductible whereas cash flows on equity (such as dividends) are not. As such, other things being equal, the higher the marginal tax rate and the more profitable a firm is, the more debt it will have in its capital structure;[6] (2) Jensen and Meckling (1976) suggest that if a firm's funds are solely from equity raising, the management of firms which have high cash flows left over each year are more likely to be complacent and inefficient. Hence, the use of debt adds discipline to management and reduces the free-cash flow problem.

On the other hand, the costs of debt include potential bankruptcy costs and agency conflicts between stockholders and bondholders: (1) Expected bankruptcy costs are a

[6] Obviously, if the firm is unlikely to earn taxable profits, the effective tax shield is small. As a result, it should not borrow because it would not be able to make use of the tax deductibility on debts on its losses.

function of both the cost of going bankrupt[7] and also the probability of bankruptcy. If the borrowing company is unable to make payments, it may face bankruptcy. Alternatively, the company may voluntarily file for bankruptcy to protect itself from further harassment from its debtors. Regardless of whether or not bankruptcy is voluntarily or forced, managers will most likely loose control of the company. This may result in a loss of employment and tarnishing of the managers' personal reputations. Hence, the cost of going bankrupt can be extensive, especially for managers. Therefore, these costs make it unlikely that a firm will push its debt equity ratio very high; (2) Under the agency cost hypothesis (a more detailed discussion will be presented in Section 2.3.5), it is assumed that stockholders favour managers who take on more risky projects and pay larger dividends. Such incentives are different from those of bondholders who prefer managers to take on less risky projects and repay principals (and any coupon payments) in time. Other things being equal, the greater the expected bankruptcy cost in the operating cash flows of the firm or agency problems associated with lending to a firm, the less debt the firm can afford to use.

Balancing the costs and the benefits of debt, the trade-off theory predicts that firms optimize their debt level such that marginal tax advantages of additional borrowing are offset by the increase in the costs of financial distress. Raising more debt increases the tax benefit (due to tax deductibility of interest payment on debt), but at the same time, an increase in debt also increases the probability of default and hence the expected cost of bankruptcy. Therefore, when a firm achieves its optimal leverage, the marginal

[7] There are many costs involved in bankruptcy. The direct costs are legal fees and court costs. The indirect costs arise from discontinued operations, the hesitancy of customers to purchase products and the unwillingness of suppliers to extend any credit.

benefit of the last dollar of debt equals its marginal cost.[8] As such, a firm tend to maintain a target leverage ratio to maximise the benefit of debt.

[2.3.2] Pecking Order Theory

In contrast to the trade-off model, Donaldson (1961), (1969) and (1984), Myers (1984) and Myers and Majluf (1984) argue for pecking order behaviour. The pecking order theory suggests that asymmetric information affects the choice between internal and external financing because managers are assumed to be better informed than investors. This asymmetric information generates adverse-selection costs which could dominate the costs and the benefits embedded in the trade-off theory.

In particular, in Myers's (1984) and Myers and Majluf's (1984) pecking order model, a firm may not have a particular target or optimal capital structure. A strict interpretation of this model suggests that firms do not aim at any target debt ratio. Instead, the debt ratio is just the cumulative result of hierarchical financing over time. In particular, Myers (2001, page 92) summarises this hierarchical financing, as predicted by the pecking order model, as follow:

(1) Firms prefer internal to external finance; [9]

[8] Taking the bankruptcy costs into account, then there may be an optimal capital structure where the marginal tax advantage equals the marginal bankruptcy costs. As the marginal bankruptcy costs may be different across firms, it explains why all firms do not have the same level of debt versus equity.

[9] Internal finance refers to the use of funds accumulated from the firm's retained earnings while external finance refers to the need to enter capital market to raise funds from potential new shareholders or debtors.

(2) Dividends are "sticky"[10], so that dividend cuts are not used to finance capital expenditure, so that changes in cash requirements are not soaked up in short-run dividend changes. In other words, changes in net cash show up as changes in external financing;

(3) If external funds are required for capital investment, the firm will work down the pecking order by issuing the safest[11] securities first. That is, they start with debt, then perhaps move to hybrid securities such as convertible securities or preferred stock, and finally to equity as a last resort.

The first preference for internal financing is based on two considerations. Firstly, because of floatation costs of new security issues, internal financing is less costly than external financing. Secondly, the preference for internal financing is attributed to the separation of ownership and control[12] and the desire of managers to avoid the discipline of capital market (Baumol, 1965 and Myers and Majluf, 1984). The use of internal financing avoids the discipline and monitoring that occur when new securities are sold publicly. In particular, for highly profitable firms with limited needs for investment funds, they can build up financial slack in the form of highly liquid assets (such as cash and marketable securities) and unused debt capacity. Such financial slack allows a firm to take advantage of any attractive investment opportunities that may occur and not be

[10] Dividends are sticky because many firms are reluctant to make major changes in dividend payments and only gradually adjust dividend payout ratios to reflect their investment opportunities.
[11] The term "safest" refers to the securities that attract the least discipline and monitoring from the capital market.
[12] While shareholders own the firm, they do not engage in the day to day operations of the firm. Instead, the decision power pertaining to the use of internal funds rests on the managers.

subject to any floatation costs or discipline and monitoring that occur when external financing is used.

A firm's capital structure changes however, when an imbalance between internal cash flows, net of cash dividend payments and acceptable (positive net present value) investment opportunities occurs. Hence, if a firm has to raise external funds, the pecking order predicts the order of choice to be extant varieties of debt in increasing order of risk[13] and finally, equity for those firms precluded from other alternatives (i.e. in extreme circumstances such as in financial duress). This hierarchy is a function of differences in financing cost. Issuing additional equity is the most expensive means of financing as it suffers the most from information asymmetries between managers, existing shareholders and potentially new shareholders. This is because the costs associated with issuing new securities might reduce existing shareholders' wealth, especially when managers have more favourable information about the firm's future cash flows than do the investors (i.e. new potential investors may undervalue the firm due to asymmetric information). On the contrary, in view of its fixed payment, debt is already less sensitive to information problems while internally generated resources do not suffer at all from issuing costs.

In summary, Myers (2001) argues that the pecking order theory explains why the bulk of external financing comes from debt. Myers (2001) also argues that the theory explains why more profitable firms borrow less: not because their target debt is low (as in the

[13] In the following order: debt, hybrids and equity as last resort.

pecking order hypothesis, they do not have a target) but because profitable firms have more internal financing available. Less profitable firms require external financing, and consequently accumulate debt.

[2.3.3] Market Timing

In contrast to the theories of trade-off and pecking order, market timing refers to managers issuing their securities during certain market conditions to take advantage of those favourable conditions. Since managers are often pressured to maximise the wealth of the firm in the shortest time with the lowest cost, it is then plausible that managers may select the choice of financing based on favourable conditions available to them. In particular, one apparent empirical regularity found by past US research is that there is a tendency for firms to issue equity when their market valuations are high relative to book values or past market values (Taggart, 1977).

Furthermore, the notion of a "hot issue" has been often linked to market timing strategies. According to Ibbotson and Jaffe (1975), "hot issues" usually refer to particular stock issues which have risen from them offering prices to higher than average return premia in the aftermarket. Distinctively, many early studies have presented evidence that unseasoned new issues generally rise to higher returns after the offering (Ibbotson, 1975; McDonald and Fisher, 1972 and Reilly and Hatfield, 1969). Ritter (1984) for example, documents that the monthly average initial returns on unseasoned new issues have been extremely high for prolonged periods. Each of these "hot issue" market periods was followed by a large and prolonged increase in the

volume of initial public offerings. Investigating the differences between "hot" and "cold" initial public offerings (IPO) markets in the US, Brailsford *et al.* (2000) also find evidence that supports the contention that the decision to issue is a function of current underpricing. Hence, managers may choose to issue their securities during the "hot period" to obtain a higher price – a market timing strategy which results in a tendency for a higher proportion of equity than debt in the firm's capital structure.

In particular, the market timing theory posits that corporate executives issue securities depending on the time-varying relative costs of equity and debt.[14] These issuance decisions have long-lasting effects on capital structure because the observed capital structure at date *t* is the outcome of prior period-by-period securities issuance decisions. Hence, according to the market timing theory, firms prefer equity when they perceive the relative cost of equity as low and prefer debt otherwise (Huang and Ritter, 2007 page 1).

[2.3.4] Signalling Theory

The signalling effect, proposed by Ross (1977), is another capital structure theory based on asymmetric information. The officers and managers of a firm, as insiders, have access to information about the expected future earnings and cash flows of the firm that is not available to outside investors. This situation is referred to as asymmetric information.

[14] Titman & Wessels (1988) were among those researchers who found that transaction costs may be an important determinant of capital structure choice. However, they did highlight that the importance may not be of particular significance as such costs are generally assumed to be small relative to other determinants.

Given that managers know more about the firm than do outside investors, changes in the firm's investment, financing or dividend decisions can represent a *signal* to investors concerning the management's assessment of the expected future returns, and hence the market value of the firm. Thus, when a firm issues new securities, this can be viewed as providing a signal to the financial marketplace regarding the future prospects of the firm or the future actions planned by the managers.

Ross (1977) argues that the signal provided by capital structure changes are credible because of the potential bankruptcy cost penalty incurred if the implied future cash flows do not occur. According to Ross, investors interpret higher levels of debt as a signal of higher quality and higher future cash flows. Lower quality firms cannot mimic higher quality firms by taking on more debt because they have higher expected bankruptcy costs at any level of debt.

[2.3.5] Agency Theory

Asymmetric information does not only cause issuance and signalling costs, it also is at the root of agency problems. The foregoing "separation of ownership and control" argument advanced by Berle and Means (1932) suggested that in the process of running a company, management might make policies which may serve more of their own interests at the expense of the shareholders. Following within the framework of agency theory, there is a strand of literature studying the impact of debt on sub-optimal managerial decision making.

One of the major perspectives is the free cash flow[15] approach put forward by Jensen (1986). In cash flow rich companies, managers may be tempted to spend abundant resources unwisely and engage in negative net present value projects. This is because managers' interests are not always the same as the owners' interests. If there is a free cash flow, managers may pursue activities which are costly to owners such as consumption of unnecessary perquisites or engage in unprofitable empire-building investments.[16] In order to mitigate this potential conflict of interest between the management and the owners, leverage can be increased: the mandatory payments of interest and principal reduce the free cash flow available for discretionary spending by managers.

However, besides using leverage as a source of discipline to align managers' interests with those of shareholders, there are other mechanisms which may be useful to discipline the managers without varying the capital structure. Jensen and Zimmerman (1985) for example, find that the mechanisms of "managerial labour market" and "executive compensation plans" can also restrict the bad behaviour of managers making policies which serve their interests at the expense of the shareholders and hence align their interests with those of the shareholders.[17]

[15] Jensen (1986) defines free cash flow as the cash flow in excess of that required to fund all projects that have positive net present values (NPV) when discounted at the relevant cost of capital. This is the cash left over after all expense and debt payments have been made and all positive NPV investments have been made.

[16] Managers have incentives to cause their firms to grow beyond the optimal size as such growth increases managers' power by increasing the resources under their control. It is also associated with increases in managers' compensation, because changes in compensation are positively related to the growth in sales (Jensen, 1986 page 323).

[17] The agency literature argues that shareholders' interests can be protected because managerial incentives can be (re)structured. Due to the threat of dismissal, managers will attempt to avoid poor performance. Further, as a result of the rewarding and incentive effects of compensation contracts, managers are given incentive to achieve strong corporate performance.

While the use of leverage can resolve the manager-shareholder's over-investment problem (i.e. unprofitable empire-building investments), leverage can also lead to a related problem due to the conflict of interest between the shareholders and the debt-holders. Once a debt obligation has been created, shareholders have the incentive to take actions which benefit themselves at the expense of the bondholders. Hence, if there is debt outstanding, the objectives of maximizing the value of the firm and the value of the equity are not identical. For example, when the proceeds of an investment would mainly benefit the debt holders, firms may be tempted to under-invest (Myers, 1977). This under-investment problem will be especially more severe for companies whose value consists principally of future growth options. This is because, due to the investment opportunities, these companies have more chance of being short of cash. Under such circumstances the pressure of the debt servicing is likely to hamper firms in the implementation of their investment programs. Therefore, these companies are better off using equity.

[2.4] Determinants Of Leverage

The theories discussed in the preceding section suggest that firms select capital structures by assessing the costs and the benefits associated with debt and equity financing. However, in order for us to investigate which theories of capital structure explain the financing decisions made by firms, researchers need to first explore the determinants of leverage. Once the determinants are established, researchers can then examine these determinants to derivate a theoretical prediction of the relationship between these determinants (individually) and leverage under the various theories of

capital structure. Such relationships are important as they provide the estimation of the impact of unobservable attributes on the choice of corporate debt ratios, and hence provide the empirical measurements to explore the various theoretical explanations which allow us to conduct competing analysis among the alternative theories of capital structure.

Using the linear structural modelling[18] (which is an extension of the factor-analytic approach), Titman and Wessels (1988) examine the range of attributes that may form the theoretical determinants of capital structure in the American context. Similarly, Rajan and Zingales (1995) also investigate the determinants of capital structure choice by analysing the financing decisions of public firms in the G7 countries.[19] The attributes examined in both studies include asset structure, non-debt tax shields, growth opportunities, uniqueness, industry classification, size, earnings volatility and profitability. These attributes are central to the formation of the various theories of capital structure as discussed in Section 2.3. Given the importance of these attributes, it will be necessary to incorporate them (or variables that proxy for them) into the empirical analysis reported in this dissertation. This will ensure that the tests of the competing theories of capital structure will not be wrongly specified through omitting variables. As such, the remaining of this section will discuss the various attributes and their associations with the various theories of capital structure.

[18] This method assumes that, although the relevant attributes are not directly observable, it allows the researcher to observe a number of indicator variables that are linear functions of one or more attributions and a random error term.

[19] G7 stands for the seven major industrialised countries consisting of United States, Japan, Germany, France, Italy, United Kingdom and Canada.

[2.4.1] Asset Structure (Asset Tangibility)

Most capital structure theories argue that the type of assets owned by a firm will affect its capital structure. This is because firms with assets can use them as collateral to issue debt and enjoy the advantages of debt issuing compared to equity issuing. Scott (1977) for example, proposes that firms can increase the value of their equity by expropriating wealth from their existing unsecured creditors. Studies by Galai and Masulis (1976), Jensen and Meckling (1976) and Myers (1977) also suggest that shareholders in leveraged firms have an incentive (see Section 2.3.5 for the discussion on such incentive) to invest sub-optimally to expropriate wealth from the firm's debt-holders. This incentive may result in a positive relationship between the capacity of firms to collateralize their debt and their debt ratios.

However, creditors are wary of the transfer of wealth away from them to shareholders and will require their loan advances to be secured or collateralized against tangible assets. This will restrict the use of funds to a specific project and gives creditors recourse to the value of the asset in case of default (Galai and Masulis, 1976 and Myers, 1977). Without collateralisable assets, the cost of borrowing may be very high. Hence, the existence of assets may also increase the firm's borrowing opportunities and thus can be expected to be positively related to debt.

On the other hand, the tendency of managers to consume more than the optimal level of perquisites may produce the opposite relationship between collateralisable capital and debt levels (i.e. firms with less collateralisable assets should use more debt) due to the threat of bankruptcy. Grossman and Hart (1982) suggest that managers are adverse to

bankruptcy because of its negative impact on their compensation plans and job security. Hence, managers of highly levered firms will be less able to consume excessive perquisites since debt-holders are inclined to closely monitor such firms (especially those firms with assets which are less collateralisable). For this reason, firms with less tangible assets (less collateralisable assets) should use more debt to monitor managerial activity even if raising debt finance is costly.

According to the trade-off theory, a firm with a relatively large proportion of assets will take up more debt. This is because firms which follow the trade-off behaviour will identify their optimal leverage by weighing the costs and benefits of an additional dollar of debt. If the firms have a relatively large portion of tangible assets, they will also have a higher liquidation value. This in turn will reduce bankruptcy costs and pave the way for firms to take up debt more readily.

Similarly, Myers and Majluf's (1984) pecking order theory also predicts a positive relationship between the collateral value of assets with the amount of leverage raised by firms. Myers and Majluf (1984) argue that firms may find it advantageous to sell secured debt as compare to issue equity as there may be costs associated with issuing securities whereby the firm's managers have better information than outside shareholders – issuing debt secured by property with known values avoids these costs. Hence, the pecking order theory suggests that managers may reduce the cost of debt by issuing secured debt: the theory expects firms with more assets which can be collateralised to use more leverage.

In contrast, neither the signalling nor the agency perspective is very helpful in formulating a relevant hypothesis concerning the link between tangibility and leverage, except perhaps that agency problems might reduce with the increase of tangible assets because there may be less room for abuse by management (Schoubben and Van Hulle, 2004).

Direct empirical evidence on the role of asset tangibility is provided by Bradley *et al.* (1984) who find the asset structure of a firm (proxied by tangible assets such as plants and equipment) to be positively related to debt. Rajan and Zingales (1995) also find a positive relationship between tangibility and leverage for all the G-7 countries in their sample. In addition, Marsh (1982) provides some indirect evidence of a positive relationship as well. Conducting a time series study, Marsh (1982) reports that larger firms with a larger tangible asset base tend to use more debt. In order to sustain high levels of debt in a firm, tangible assets which can be used as collateral are essential in a firm's capital structure. In contrast, Titman and Wessels (1988) find that this asset tangibility does not appear to be related to the various measures of leverage. Using six different debt ratios: short-term, long-term and convertible debt standardized by book value and market value of equity respectively, Titman and Wessels (1988) find that the collateral value attribute is significant at 10% level for only one debt measure: short-term debt over book value of equity.

[2.4.2] Non-Debt Tax Shield

Modigliani and Miller (1963) suggest that firms gain advantage in the form of tax deductions associated with interest payments on debt. Hence, the non-debt tax shield is a characteristic which fits in with the trade-off theory of capital structure. This is because trade-off theory predicts firms will raise debt to take advantage of the debt tax shield. Hence, if firms can generate a high non-debt tax shield, they may reduce their usage of debt as they can still enjoy the tax deductions from the non-debt tax shield.

Titman and Wessels (1988) indicate that tax deductions for depreciation and investment tax credits are substitutes for the tax benefits of debt financing. Similarly, this view is also argued by DeAngelo and Masulis (1980) who present a model of optimal capital structure that incorporates the impact of corporate taxes, personal taxes and non-debt related corporate tax shields. Therefore, both studies suggest that it can be assumed that firms with large non-debt tax shields relative to their expected cash flow will include lesser debt in their capital structure as these non-debt tax shields provide tax advantages similar to debt. As such, the trade-off theory hypothesizes a negative relationship between non-debt tax shields and the amount of leverage. Schoubben and Van Hulle (2004) however, suggest that the relationship may also be positive as firms with substantial non-debt tax shields are likely to have considerable tangible assets. Consequently, there is more room for cheap borrowing which may encourage firms to use more leverage.

Empirically, evidence for the relationship between non-debt tax shields and leverage is also mixed. Earlier cross sectional studies by Bradley *et al.* (1984), Long and Malitz

(1985) and Titman and Wessels (1988) did not result in a consistent story. Bradley *et al*. (1984) find a positive and significant relationship between the non-debt tax shields and leverage. In contrast, Long and Malitz (1985) and Titman and Wessels (1988) find a negative but insignificant relationship – there is no link between non debt tax shields and leverage. Later studies of dynamic capital structure also find mixed results for the relationship between non-debt tax shields and leverage. MacKie-Mason (1990) finds that the non-debt tax shield parameter is positively related to leverage. Sharpe and Pooley (1990) regress their measure of non-debt tax shields on the capital ratio (defined as the ratio of capital to total assets) of finance companies find it to be negative but statistically insignificant.

From past studies, it is apparent that the actual relationship between leverage and non-debt tax shields has been difficult to discern. This may, in part, be due to the difficulties associated with deriving an accurate measure of a non-debt tax shield. Titman and Wessels (1988) for example, proxy the non-debt tax shields with three different measures:

(1) Ratio of investment tax credits over total assets;

(2) Ratio of depreciation over total assets; and

(3) Ratio of direct estimate of non-debt tax shields over total assets.

However, Titman and Wessels (1988) acknowledge that these proxies measure the current tax deductions associated with capital equipment and hence, only partially capture the non-debt tax shield variable. This is because these proxies exclude tax deductions (such as research and development and selling expenses) which are not

associated with capital equipment. Further, these proxies represent tax deductions rather than tax deductions net of true economic depreciation and expenses (which is the economic attribute suggested by the trade-off theory). Unfortunately, Titman and Wessels (1988) concede that the latter preferable attribute would be very difficult to measure (Titman and Wessels, 1988 page 4).

The proxy definition is further complicated by differences in accounting regulations and tax laws resulting in different treatments of accounting numbers such as research and development costs and depreciation expenditures.

[2.4.3] Growth Opportunities

Myers (1977) identified two types of assets of a firm: (1) growth opportunities[20] and (2) tangible assets. In particular, relative to entities with few growth opportunities, firms with greater growth options tend to be riskier as their managers are normally given more discretion over investment decisions (Smith and Watts, 1992). As a result, managerial decisions in firms with high growth prospects may be less transparent to outside parties (e.g. creditors) than other firms thus increasing agency costs (e.g. monitoring expenditures such as those associated with curbing the tendency for equity controlled firms to invest sub-optimally to expropriate wealth from the firm's debt-holders). Therefore, expected future growth should thus be negatively related to the level of long-term debt.

[20] Growth opportunities refer to the presence of future investment opportunities for the firms.

However, Myers (1977) also points out that the use of short-term rather than long-term financing for growth opportunities can reduce the costs associated with contractually bonding management. If an investment opportunity arises before a debt matures, then firms never get to invest sub-optimally; long term debt can be replicated by rolling-over short term debt and sub-optimal investments will always be avoided (Chiarella *et al.*, 1991).

On the other hand, growth opportunities are capital assets which are viewed as intangible. They add value to a firm but cannot be collateralised for purposes of borrowing funds or generate current taxable income. Therefore, a negative relationship between growth opportunities and debt can also be hypothesized because a firm's borrowing capacity is limited to the extent that their assets are in the form of intangible or unrealized growth opportunities.

Under the predictions of the trade-off theory, there is a negative relationship between growth opportunities and debt. This is because, as discussed in the above paragraph, since growth opportunities are intangible, growth firms will borrow less because of the increased expected costs of bankruptcy. [21]

In contrast, the pecking order theory posits that growth firms have continuously large cash flow needs that their internal financing is not likely to fulfill the needs of. Consequently, firms with growth opportunities are more likely to utilize debts.

[21] Intangible growth options are only valuable when a firm is deemed to be a going concern. Therefore, their value will drop dramatically if the firm faces bankruptcy. This suggests that the expected costs of financial distress for firms with high growth opportunities are likely to be higher than for firms with low growth prospects (Myers, 1984).

Therefore, according to the pecking order theory, a positive relationship between growth opportunities and debt exists.

From the signalling perspective, growth may serve as an alternative quality signal to the market. Hence, there is no need for the firm to use debt to signal its good quality. Therefore, a negative relationship between growth opportunities and debt should exist.

The agency theory also suggests that growth firms should have lower leverage (a negative relationship between growth opportunities and debt). As discussed at the beginning of this section, the difficulty in monitoring managerial activity of a growth firm increases the monitoring costs relative to those firms with fewer growth opportunities. As a result, high growth firms will reduce the usage of debt to avoid the pressure of the additional cash outflows for debt servicing.

A common proxy for growth opportunities is the market-to-book ratio. However, such a measurement may be a proxy for growth opportunities or a proxy for market timing. If the proxy is a true measurement for timing the market, the predicted relationship between the market-to-book ratio and leverage should be negative if a firm follows market timing strategy: the higher the ratio, the higher the market value of the firm as compared to its book value (the more the firm's value is mis-valued) and the higher chance the manager will take advantage of the misevaluation and issue more equity than debt.

Past empirical studies investigating the relationship between growth opportunities and leverage is mixed. While Bradley *et al.* (1984) and Rajan and Zingales (1995) find a significant negative relationship, Titman and Wessels (1988) find mixed results for their different debt ratio measures. Specifically, Titman and Wessels (1988) find no connection between growth opportunities and leverage when they use their measures standardized by market value of equity. However, they find a significant positive effect when using the long-term debt standardized by book value.[22]

[2.4.4] Uniqueness And Industry Classification

Titman (1984) suggests that firms in highly specialised industries will find bankruptcy more costly because workers (including managers) in such industries are often specialists in their particular field, thus less employable in the event of retrenchment. Furthermore, customers and suppliers of these industries will also suffer relatively high costs: customers may find it difficult to obtain servicing for their specialized products while suppliers handle very specific products for unique processes which are not employed by other industries in general. For these reasons, uniqueness is expected to be negatively related to debt ratios to maintain a low risk profile. Titman (1984) for example, hypothesizes that firms which are unique in their line of business should be financed with relatively less debt. Empirically, Titman and Wessels (1988) find that firms in unique industries have low debt ratios: firms choose low debt ratios if, in the event of liquidation, its customers, workers and suppliers face very high costs.

[22] However, Titman and Wessels (1988) argue that the positive coefficient is not necessary to be viewed as inconsistent with the agency and tax-based theories that predict a negative coefficient. Instead, they argue that the observed effect simply implies that, since growth opportunities add value to a firm, they increase the firm's debt capacity and, hence, the ratio of debt to book value, since this additional value is not reflected in the firm's book value.

[2.4.5] Size Of Firm

Warner (1977) and Ang *et al.*(1982) suggest that direct bankruptcy costs appear to constitute a larger proportion of a firm's value as the value decreases. Further, larger firms tend to be more diversified as compared to relatively smaller firms and therefore will face lower bankruptcy risk. Given that the bankruptcy costs arguments imply that the risk of bankruptcy discourages managers from using debt in a firm's capital structure (Shapiro and Titman, 1985 and Castanias, 1983), these arguments suggest that larger firms should be more highly leveraged.

However, the cost of issuing debt and equity securities may also suggest that smaller firms may be more leveraged than large firms. It is conceivable that larger firms incur relatively lower transaction costs in issuing new equity when compared to smaller firms and hence would hold less debt relative to a smaller firm (Chiarella *et al.*, 1992). Small firms pay much more than large firms to issue new equity and hence will be more prone to issue debt.

From the perspective of the trade-off theory, as large companies are more diversified and less prone to bankruptcy, they will opt for more debt in their capital structure. Hence, a positive relationship between the size of the firm and debt should exist.

Similarly, the pecking order theory also predicts a positive relationship between the size of the firm and debt because compared to smaller firms, information asymmetries are smaller for larger firms. Therefore, larger firms have easier access to the market for debt

finance (Schoubben and Van Hulle, 2004). Pecking order theory however, can also be used to argue for a negative relationship between the size of the firm and its debt. As issuing equity is relatively more costly for smaller firms, smaller firms may be more leveraged than larger firms.

As more information is available to outside investors for larger firms, there is also less need for quality signalling through high debt levels by them. This is because outside investors will be able to identify the good quality firms' from those which are bad based on the vast publicly available information. Also, in view of the availability of more information, the agency perspective would also predict less need for debt as a disciplining device because there are less information asymmetry problems among managers, shareholders and debt-holders. Therefore, both the signalling and agency perspectives would predict a negative relationship between the size of the firm and leverage.

Overall, preceding discussion shows that the theories examined in this dissertation can be used to justify very different hypotheses on the relationship between firm size to leverage. Empirical investigations also paint an inconsistent picture. Friend and Hasbrouck (1988) and Crutchley and Hansen (1989) find a significant positive relationship between the size of the firm and leverage.

Rajan and Zingales (1995) on the other hand, find a positive relationship between the size of the firm and leverage for the US, UK, Japan and Canada but find no effect for France and Italy, while the impact for Germany is negative. Titman and Wessels (1988)

find some evidence that firm size and leverage are negatively related but conclude that, due to their definition of leverage, the evidence is more indicative of a relationship between market values of equity and firm leverage rather than any firm size effect.[23]

[2.4.6] Earnings Volatility (Risk)

The variability of earnings (a proxy for company risk) may also affect a firm's capital structure. An unfavourable movement against the earnings of a firm increases its cost of financial distress. If this cost of financial distress becomes significant, the firm's optimal debt level is likely to be a decreasing function of the volatility of earnings (Titman and Wessels, 1988).

Specifically, the trade-off theory implies that the expected cost of financial distress increases with risk and hence the probability that the tax shield will be (fully) used decreases. Hence, the theory predicts a negative relationship between the volatility of earnings and leverage.

Furthermore, risk also exacerbates the negative impact of asymmetric information. Compared to managers who have inside information about their firm, debtors do not have the same level of information about the firm, as do the managers. Hence, the variability of earnings is likely to make debtors more worried about the future prospect

[23] Specifically, Titman and Wessels (1988) find that their size attribute is related to long-term debt scaled by book value of equity but not to long-term debt scaled by market value of equity. Since they use the natural logarithm of sales as the indicator of size, it is related to the market value of the firm. Therefore, large firms have higher market values and are able to include more debt in their capital structure (Titman and Wessels (1988, page 14).

of the firm and, more importantly the future prospect of the money they have loaned to the firm. As a consequence, debtors are likely to protect themselves by strengthening the conditions of debt contracts (such as imposing a premium for the required rate of return or imposing more stringent covenants). Therefore, as direct and indirect costs of debt increase (making debt finance less attractive), the pecking order hypothesis predicts a negative relationship between risk and leverage.

If risk really exacerbates the negative impact of asymmetric information, then the need for quality signalling and disciplining should increase as well. Under the signalling theory prediction, the higher the impact of the asymmetric information, the more managers should issue debt to signal to the outside investors that their firms are of good quality and able to continue to service their debt financings. Under the agency theory, if information asymmetry is high, debt financing should be used to as disciplining tool to align the managers' interests with those of the owners of the firms. Therefore, in contrast to trade-off and pecking order theories, signalling and agency theories both predict more leverage as risk increases.

Empirically, the relationship between volatility of earnings and debt is found to be mixed. For example, Bennett and Donnelly (1993) find a positive impact for the volatility of earnings on debt while Titman and Wessels (1988) report a negative but insignificant relationship.

[2.4.7] Profitability

Another important firm characteristic that may influence capital structure is profitability. If in the short run, dividends and investments are fixed, and if debt financing is the dominant mode of external financing, then changes in profitability will be negatively correlated with changes in leverage.

Profitable firms are less likely to go bankrupt and hence can sustain more debt to capture more tax advantages. Therefore, the trade-off theory would predict a positive relationship between the profitability of a firm and leverage.

Myers (1984) cites evidence from Donaldson (1961, 1969 and 1984) and suggests that firms prefer raising capital: first from retained earnings, second from debt and third from issuing new equity. This behaviour may be due to the costs of issuing new equity where the costs may include costs relating to asymmetric information or high transaction costs (Myers and Majluf, 1984). Therefore, under the pecking order theory, a firm with high past profitability (and hence the greater opportunities to retain earnings) is expected to have access to greater internal finances and hence, will tend to hold less debt in its capital structure.

Similar to the prediction of the pecking order theory, Ross's (1977) signalling theory predicts a negative relationship between profitability of a firm and debt. In the presence of asymmetric information, managers are expected to effect capital structural changes to indicate the future profitability of the firm. As high profitability may serve as an alternative signal of quality, there is less need for profitable firms to take on high

leverage to distinguish themselves from lower quality companies. Alternatively, if managers share in firm profitability via compensation plans and are primarily responsible for a firm's financing decisions, a nexus is forged between firm profitability and managerial wealth. Therefore, the desire to signal future profitability stems from managerial preferences (Blazenko, 1987). Future profitability is viewed, under both propositions, as an attribute which determines a firm's capital structure and is expected to be positively related to leverage since managers utilise debt to signal investments which yield high profits in the future.

In contrast, under the free cash flow theory of Jensen (1986), in profitable firms with excess cash flow, a higher debt level is needed to refrain managers from engaging in sub-optimal investment projects. Therefore, agency based theories predict a positive relationship between profitability of a firm and leverage.

Among earlier empirical tests of profitability as a determinant are the cross-sectional studies by Friend and Hasbrouck (1989) and Titman and Wessels (1988). Both studies find a significant negative relationship between leverage ratios and profitability. Rajan and Zingales (1995) also report a negative effect for their US, Japan, UK and Canada samples.

[2.4.8] In Summary

The preceding Sections 2.4.1 to 2.4.7 outline the determinants of leverage and the theoretical predictions of the relationship between these determinants (individually) and leverage under the various theories of capital structure. Such relationships are important

as they provide the empirical measurements to explore the various theoretical explanations which allow us to conduct competing analyses among the alternative theories of capital structure. The incorporation of these determinants will ensure that the tests of the competing theories of capital structure will not be wrongly specified through omitting variables. The next section will discuss the empirical evidence on theories of capital structure.

[2.5] Empirical Evidence On Theories Of Capital Structure

For the last twenty or so years, many researchers have investigated the determinants of financial policy decision and sought to provide empirical explanations for the capital structure.

Distinctively, a lot of the studies investigate the theories of trade-off, pecking order and market timing. Many of these studies run a horse race among these three competing theories in which all of them have an opportunity to reveal their relative impact on the securities issuance decision. Predominately, the signalling and agency theories are often tested under the context of the pecking order theories due to the related information asymmetries notion for all the three theories.[24] Hence, this section will only discuss direct evidence relating to the theories of trade-off, pecking order and market timing.

[24] As discussed in Section 2.3, one of the central assumptions for the pecking order, signalling and agencies theories is the presence of information asymmetry. Given that they all have the common assumption, the three theories are exploring the various aspects of the same problem of information asymmetry.

For the studies in the 60s and 70s, empirical work is dominated by trade-off theory. In the 80s, the pecking order hypothesis became a popular framework to explain the capital structure of a firm. However, from 2000s onwards, many empirical studies began to question the explanatory power of the pecking order hypothesis. Although the idea of market timing was developed as early as the 70s, it was the survey by Graham & Harvey (2001) that re-ignited the notion that managers time the market when issuing securities. Nevertheless, the support for market timing is not without its drawbacks. For the market timing hypothesis to be considered an important determinant for capital structure choice, its impact on capital structure must be persistent across time. However, many studies have found the impact of the market timing hypothesis to be too short to be deemed as an important determinant for capital structure choice. This questions the usefulness of the explanatory power of the market timing hypothesis. The rest of this section will discuss some of the central empirical studies relating to the alternative theories of capital structure.

[2.5.1] Empirical Evidence On Trade-Off Theory

Trade-off theory is directly linked to Modigliani and Miller's propositions that firms identify their optimal leverage by weighing the costs and benefits of an additional dollar of debt.

Specifically, there is evidence in favour of the static trade-off and optimal capital structure. Schwartz and Aronson (1967) for example, document evidence of strong industry effect in debt ratios which they interpret as evidence of optimal ratios.

Furthermore, many past studies have reported that observed leverage ratios relate to a firm's characteristics such as size, growth opportunities, asset tangibility and the marginal tax rate, in a manner consistent with the predictions of trade-off theories. Long and Malitz (1985) for example, show that leverage ratios are negatively related to research and development expenditures (a proxy they use for intangible assets) while Smith and Watts (1992) document a negative relationship between growth opportunities and debt ratios. In his 1990 study, Mackie-Mason (1990) reports evidence that firms with tax losses to carry forward are less likely to issue debt. This conclusion is consistent with Modigliani and Miller (1966) who find the positive effects of interest tax shields in the market values of electric utilities. Furthermore, Bradley *et al.* (1984) develop a model that synthesizes a balancing theory of optimal capital structure by incorporating personal taxes on equity and on bond income, expected costs of financial distress (bankruptcy costs and agency costs), and non-debt tax shields and their findings support the trade-off theory of capital structure.

The trade-off theory is also supported by studies which analyse how the deviation from target leverage can be an important determinant of the choice of external financing (i.e. debt versus equity) for a firm. Taggart (1977), Marsh (1982), Auerbach (1985), Jalilvand and Harries (1984) and Hovakimian *et al.* (2001) find evidence of mean reversion in debt ratios or evidence that when firms adjust their capital structure, they tend to move towards a target level of debt. Using a logit model, Marsh (1982) finds that the probabilities of debt and equity issues vary with the deviation of the current debt ratio from the target, which he estimates as the observed average over his sample period. Similarly, Opler and Titman (1994) who also use a logit model, but estimate the target

using a cross-sectional model, also come to broadly similar conclusions. Taggart (1977) and Jalilvand and Harris (1984) estimate target-adjustment models and find significant adjustment coefficients, which they interpret as evidence that firms optimize their debt ratios. Auerbach (1985) also estimates a target-adjustment model, but allows for firm-specific and time-varying targets. He also interprets the significant adjustment coefficients as support for target-adjustment behaviour. Employing a two-stage estimation procedure, Hovakimian *et al.* (2001) try to empirically capture the idea that firms make financing choices which move them toward a target debt ratio. Their results suggest that firms make their financing choices consistent with trade-off models of capital structure choice.

In contrast, Titman and Wessels (1988), using a latent variables approach[25], have found mixed evidence for the role of the factors predicted by the static trade-off theory. Further, other evidence is inconsistent with the optimal debt ratios or can be interpreted differently. First, as pointed out by Myers (1984), the negative valuation effects of equity issues or leverage-reducing exchange offers do not support the trade-off story. If changes in debt ratios are movements towards the optimal level of debt (where the present value of interest tax shields is equal to the present value of costs of financial distress), both increases and decreases in leverage should be value enhancing: increases in leverage maximise the present value of interest tax shields and decreases in the leverage minimise the present value of the costs of financial distress. Secondly, Kester (1986), Titman and Wessels (1988) and Rajan and Zingales (1995) find strong negative

[25] Titman and Wessels (1988) develop estimators for existing variables known to play a role in determining the choice of a firm's capital structure and test them empirically.

relationships between debt ratios and past profitability. Models based on the trade-off of the tax benefits of debt and the costs of financial distress predict a positive relationship.

[2.5.2] Empirical Evidence On Pecking Order Theory

In contrast, Myers (1984) developed a theory that would explain a firm's financing behaviour in capital structure choice by testing two contrasting frameworks :(1) A static tradeoff framework (in which the firm is viewed as setting a target debt-to-value ratio and gradually moving towards it, in much the same way that a firm adjusts dividends to move towards a target payout ratio) and (2) an old fashioned pecking order framework (in which the firm prefers internal to external financing, and debt to equity if it issues securities). Myers (1984) argued that while the static tradeoff theory works to some extend, it seems to have an unacceptably low statistical explanatory power (i.e. low R^2). Instead, his results provided a justification for pecking order behaviour which was previously suggested by Donaldson (1961), (1969) and (1984). Myers's (1993) organizational theory of capital structure further suggested that pecking order behaviour may be driven by asymmetric information or agency costs.

Other studies which find support for pecking order theory include Shyam-Sunder and Myers (1999) who analyse which type of financing (debt or equity) is used to fill the "financial deficit". Specifically, financial deficit arises when a firm invests more than it internally generates. Hence, if a firm has a financial deficit, such deficit must be filled with (net) sales of new securities. Shyam-Sunder and Myers (1999) test the pecking order model against the static trade-off theory. First, they regressed financing deficit on

the amount of net debt. In testing the sensitivity of changes in net debt to a firm's financial deficit, the pecking order theory implies a close to one-to-one relationship. Secondly, to test the target adjustment model, net debt is regressed on the difference between the firm's target and actual debt. Shyam-Sunder and Myers (1999) find that both models explain the variation in net debt, although the pecking order model seems to be a far better fit. When they combine both specifications into one model, the target adjustment coefficient remains significant, but again the pecking order variable seems superior in explaining changes in the debt ratio. In addition, Shyam-Sunder and Myers (1999) also compare the explanatory power of both models on simulated data based on the pecking order model or the conditional target model. The pecking order model can be easily rejected when false, while the target adjustment model cannot be rejected, even when false. In summary, finding that a simple pecking order model explains much more of the time-series variance in observed debt ratios than a target adjustment model based on the static trade-off model, Shyam-sunder and Myers (1999) conclude that pecking order is a much better explanation for the debt-equity choice.

In Australia, there is also evidence supporting the pecking order theory. For example, based on a series of field interviews undertaken with company secretaries and senior financial personnel from 48 listed Australian companies, Allen (1991) reports that companies appear to follow a pecking order with respect to funding sources. He also reports policies of maintaining spare debt capacity, which is consistent with pecking order prediction that firms will maintain moderate debt/equity ratio so that they are in a position to regard debt as an automatic extension of internally generated funds. Chiarella e*t al.* (1992) also find significant negative relationships between profitability and all

debt ratios and conclude that Australian firms prefer to finance investment with internally retained funds before issuing debt. This supports the notion that Australian companies have a pecking order of financial strategies. More recently, Suchard and Singh (2006) find further support for pecking order in their analysis of the determinants of the hybrid security issuance decision for Australian firms.[26]

However, other empirical tests which set out to establish "if pecking order theory holds", have found evidence which questions pecking order's ability to explain a firm's capital structure. Fama and French (2002) agree that the negative effect of profitability on leverage is consistent with the pecking order as suggested by Shyam-Sunder and Myers (1999). They however, also find an offsetting response of leverage to changes in earnings, implying that the negative profitability effects are in part due to transitory changes in leverage instead of changes in the target. Frank and Goyal (2003) replicate Shyam-Sunder and Myers (1999)[27] on a larger sample and with longer horizon and find evidence suggesting that net equity issues commonly exceed net debt issues. Further, net equity issues track the financing deficit more closely than do net debt issues. This is inconsistent with the pecking order theory because the theory predicts that financial deficits should be filled with debt issues. When Frank and Goyal (2003) further analyse their sample by splitting their data over different observation periods (i.e. 1971-1989

[26] Suchard and Singh (2006) use a bivariate logit and multinomial logit model to examine the choice of hybrid issues (warrants, convertible debt, and preference shares). Suchard and Singh (2006) reject the market timing hypothesis and infer their pecking order support based on the logit regressions. However, Suchard and Singh (2006) do not directly address the impact of any market timing strategy on the capital structure of a firm.

[27] Chirinko and Singha (2000) argue that the elegantly simple test by Shyam-Sunder and Myers (1999) generates misleading inferences when evaluating plausible patterns of external financing. In particular, Chirinko and Singha (2000) show that the empirical evidence by Shyam-Sunder and Myers (1999) can evaluate neither the pecking order nor static trade-off models.

and 1990-1998) and into different sizes (i.e. small, medium and large firms), they find that the greatest support for the pecking order is found among large firms in the earlier observation periods (i.e. 1971-1989). However, pecking order declines over time because equity becomes more important.

Fama & French (2005) find that equity issues are commonplace and reject the central predictions of the pecking order hypothesis about how often and under what circumstances firms issue and repurchase equity. Their results suggest that the pecking order breaks down because there are other ways to issue equity with low transaction costs and modest asymmetric information problems such as issuing shares to employees, rights issues and direct purchase plans.[28] As such, transaction costs and asymmetric information problems may not seriously constrain equity issues. Instead, lower transaction costs of equity can encourage firms to issue equity instead of debt.

[2.5.3] Empirical Evidence On Market Timing

Taggart (1977) demonstrates that movements in the market values of long-term debt and equity are important determinants of corporate security issues. In particular, there is a tendency of firms to issue equity when their market valuations are high relative to book values or past market values. In Taggart's (1977) study, the coefficients of stock market timing variable suggest that bonds are substituted for equity issues when the stock market is depressed.

[28] In Australia, dividend reinvestment plans can be another example of issuing equity with low transaction costs and modest asymmetric information problem.

Stating that, "*investment bankers appear to advise their clients that it is advantageous to issue their securities in "hot issue"*[29] *markets"*, Alexander *et al.* (1979) seek to investigate the market timing strategies in convertible debt financing. Using a US sample of 360 new convertible debenture offerings collected from all offerings of convertible debt between December 1965 and December 1972, Alexander *et al.* (1979) find that the first-month performance of newly issued convertible debentures is predictable for one month into the future. However, there is no evidence which reveals any collective strategy of issuers to offer their convertible debentures in "hot" or "cold" issue markets. Nonetheless, Alexander *et al.* (1979) describe that their finding may be caused by the non-existence of market timing strategies for new issues or by the issuers' failure to employ such strategies successfully because of the limited time in which to register the security and offer it to the public.

Bayless and Chaplinsky (1996) on the other hand, link the decision to issue equity with the cost of equity in order to search for "windows of opportunity", during which it is more favourable for a firm to issue equity. They find evidence for the existence of high volume equity markets ("hot" markets) and low volume equity markets ("cold" markets). Their results indicate that average price reactions in "hot" markets are significantly less negative, while price reaction in "cold" markets are significantly more negative than at other times.

[29] In which a "hot issue" market is defined as a period when new issues exhibit higher than average rates of return relative to the entire market (Alexander *et al.*, 1979 page 143).

More recently, Graham & Harvey (2001) conduct a survey exploring the theory and practice of corporate finance within corporations and find that two-thirds of American Chief Financial Officers agreed that, *"the amount by which our stock is undervalued or overvalued was an important or very important consideration"*, in issuing equity and an even higher percentage of those surveyed agreed that, *"if our stock price has recently risen, the price at which we can sell is 'high' "*.[30] Here, managers are confessing to timing the market. A separate paper by Dharan & Ikenberry (1995) also found that management "time" their corporate listing decisions to follow good performances in stock returns.

This idea of market timing is formally tested by Baker and Wurgler (2002) who argue that managers time the market to issue equity instead of debt when:

(1) Market value is high relative to book value and past market value;

(2) Cost of equity is relatively low; and

(3) Investors are rather too enthusiastic about earnings prospects.

Their findings report that historical market-to-book ratios (averaged using a weighting scheme where market-to-book ratios in years with higher external financing receive higher weights) have a statistically and economically significant impact on the current capital structure. Primarily, they report evidence that low leverage firms issue securities when market value are high and high leverage firms issue securities when market values

[30] The survey implicitly suggests that when their existing share prices are high in value, managers would tend to issue seasoned equity so that the offerings would fetch a high price as well.

are low. Baker and Wurgler (2002) argue that neither the trade-off nor the pecking order theory is consistent with the negative effect of long past market-to-book ratios on firm leverage. Instead, they contend that firms time their net equity issues to equity market conditions, and that the changes in capital structure induced by these issues persist because firms do not care to adjust their debt ratios toward the target in subsequent years. As a result, not only do timing considerations play a very important role in the companies' financial decisions, companies' capital structures are also the cumulative outcome of past attempts to time the equity market. Hence, their results are consistent with the hypothesis that market timing has large and persistent effects on capital structure.

In Australia, there is no study[31] which has tested the market timing impact on capital structure directly as those conducted in the US. However, while examining the cyclical behaviour of the IPO market in Australia, Brailsford *et al.* (2000) find that "hot issue" periods do appear to exist in the Australian IPO market and are characterised initially by a large degree of underpricing followed by unusually high new issue volume. More importantly, "hot issues" periods appear related to general stock market conditions as issuers are expected to consider stock market conditions when timing their issues. This supports the hypothesis that managers time their issues in an attempt to take advantage of favourable market conditions. This finding implies the importance of market timing strategy on the Australian firms' choice of capital structure. Given the lack of Australian studies, this dissertation will contribute to our understanding by providing a timely and

[31] Suchard and Singh (2006) is the closest Australian study which includes the market timing hypothesis. However, their methodology does not allow a direct testing of the market timing hypothesis against the other classical theories of capital structure.

advance knowledge of the impact of market timing on a firm's capital structure in the Australian context.

Nonetheless, there are recent market timing related studies, such as Alti (2006) and Kayhan and Titman (2007), which have questioned Baker and Wurgler's (2002) persistence result. Isolating timing attempts in a single major financing event - the Initial Public Offering (IPO) and by identifying market timers as firms which go public in "hot issue" markets, Alti (2006) finds American "hot" market IPO firms issue substantially more equity and lower their leverage ratios more than "cold" market firms do. He relates the findings to a timing effect which cannot be explained by firm-level or industry characteristics. However, the persistence of the market timing impact is short-lived as the timing effect on leverage quickly reverses. Immediately after going public, "hot" market firms start increasing their leverage ratios by issuing more debt and less equity relative to "cold" market firms. At the end of the second year following the IPO, the impact of market timing on leverage completely vanishes. Hence, Alti (2006) concludes that while market timing is an important determinant of financing activity in the short run, a firm's capital structure policies, in the long term appear to be largely consistent with the existence of a leverage target.

Kayhan and Titman (2007) examine how cash flow, investment expenditures, and stock price histories affect debt ratios. Although they confirm that firms that happen to raise capital in years in which their stock prices are relatively high tend to reduce their debt ratios, their timing measure which captures the spirit of the Baker and Wurgler intuition,

has a relatively weak effect on observed debt ratios. Hence, Kayhan and Titman (2007) argue that it is the persistence of the firm's average market-to-book ratio rather than the covariance between market-to-book and the financial deficit which drives the persistence result in Baker and Wurgler (2002). Baker and Wurgler's (2002) results are driven by the persistence in market-to-book ratios rather than timing. Kayhan and Titman (2007) instead, report that although the firms' histories strongly influence their capital structures, over time their capital structures tend to move towards target debt ratios that are consistent with the trade-off theories of capital structure.

Hovakimian (2006) on the other hand, develops new evidence that allows the re-evaluation of Baker and Wurgler's (2002) conclusions about firm behaviour and capital structure policy. Hovakimian (2006) finds no convincing evidence that equity market timing is responsible for the strong negative effect of long past market-to-book ratios on leverage. While his results suggest that equity issues are timed to periods of high market-to-book ratios, Hovakimian (2006) also finds that the effect of equity issues on leverage is economically small and short-lived. Further, the equity repurchasers' timing patterns and their impact on leverage are even weaker. In contrast, debt issues have a significant long lasting effect on capital structure, but their timing is unlikely to induce a negative relationship between the market-to-book ratio and leverage. Furthermore, although debt reductions also have a significant effect on leverage, the changes in the market-to-book ratio around debt reductions are opposite to what the equity market timing implies and may induce a positive rather than a negative relationship between the market-to-book ratio and leverage.

Nonetheless, Huang and Ritter (2007) revisit the three pre-eminent theories of capital structure (i.e. static trade-off, pecking order and market timing models) and argue that no single theory of capital structure is capable of explaining all the time-series and cross-sectional patterns documented by past studies. Huang and Ritter (2007) find that, consistent with the market timing theory, firms fund a larger (smaller) proportion of their financing deficit with net external equity (debt) when the expected equity risk premium (i.e. cost of equity) is lower. The leverage is lowered for many subsequent years with the impact gradually diminishing over time. Furthermore, their estimates of the speed of adjustment towards target debt ratios suggest that firms do move towards target debt ratios, although at a moderate pace[32]. Therefore, their evidence suggests that both the market timing model and the static trade-off model are important determinants of capital structure, whereas the pecking order model fails to describe their findings; while firms act as if they follow a pecking order model with a strict preference for debt when external financing is needed, this behaviour only happens when the cost of equity is high. In periods when the cost of equity is lower however, the pecking order model fails as a descriptive model of how firms behave.

[2.6] Conclusion

This chapter presents a review of seminal literature related to the area of capital structure. The chapter begins by revisiting the influential work by Modigliani and Miller (1958, 1961 and 1963) and highlights the important contributions of the MM's

[32] If firms adjust quickly towards their target leverage, which changes across time as firm characteristics and market conditions change, then historical financing activities and market conditions will have only short-lived effects on firms' current capital structures, implying that the market timing theory of capital structure is unimportant.

propositions: the theory tells us what kinds of market imperfection we need to look for and pay attention to, when deciding on the mixture of securities to form a firm's capital structure.

Since MM, a number of alternative theories of capital structure have subsequently been developed to explain how much leverage (i.e. the relative amount debt in the capital structure) a firm should take on and why. Trade-off theory which envisages that managers try to sustain an optimal target capital structure by weighing the costs and the benefits of an additional dollar of debt is immediately linked to the MM's theorem and the first and oldest capital structure theory developed. Its competing rival theory, Myers's (1984) and Myers and Majlufs' (1984) pecking order theory however, suggests that the choice of capital structure follows a hierarchical order with a preference for internal over external finance, and for debt over equity due to the presence of information asymmetries and the related cost concerning the issuance of securities. The market timing perspective on the other hand, argues that the choice of security is determined by the window of opportunity available to the managers during the point of issuance. Primarily, managers will issue equity during the "hot" period when their firms' market valuations are high relative to book values or past market values. Lastly, two other theories which also receive attention are the theories of signalling and agency. Both these theories are developed based on the notions of information asymmetric and the conflicts of interest arising among the managers, shareholders and debt-holders.

Past studies which examine the determinants of leverage are useful to our investigation of the explanatory power of the various alternative capital structure theories. This is

because these determinants provide the estimation of the impact of unobservable attributes on the choice of corporate debt ratios. Such estimation hence, provides the empirical measurements to explore the various theoretical explanations and allow us to explore the theories of trade-off, pecking order, market timing, signalling and agency. Specifically, the determinants outlined are asset structure, non-debt tax shields, growth opportunities, uniqueness, industry classification, size, earnings volatility and profitability.

Sections 2.4.1 to 2.4.7 then discuss the various hypotheses of the relationships between these determinants and leverage under the various alternative theories of capital structure (Table 2.1 provides a summary of the hypotheses under the various capital structure theories).

Table 2.1: Summary Of The Relationships Between The Determinants And Leverage Under The Various Alternative Theories Of Capital Structure

		Relationship with leverage								
Attributes		Trade-off theory		Pecking order theory		Signalling theory		Agency theory		Market timing theory
Asset Tangibility		Positive		Positive		no prediction		No prediction		no prediction
Non-debt tax shields		Mixed		no prediction		no prediction		No prediction		no prediction
Growth Opportunities		Negative		Positive		Negative		Negative		Negative
Uniqueness		Negative		no prediction		no prediction		No prediction		no prediction
Size		Positive		Mixed		Negative		Negative		no prediction
Risk (volatility)		Negative		Negative		Positive		Positive		no prediction
Profitability		Positive		Negative		Mixed		Positive		no prediction

These hypotheses provide the fundamental basis for empirical studies in investigating the validity of the alternative theories. However, many of the propositions of the determinants on the leverage are similar under alternative theories. This highlights one of the difficulties faced by all capital structure research which is, *how to distinguish between the theories of capital structure?*

The last section of chapter discusses seminal empirical capital structure studies. Most studies evolve around the tests of trade-off, pecking order and market timing models. Past empirical studies however, have not provided support for one of the many competing theories of capital structure: evidence from these studies has been inconsistent. Many of the hypotheses relating to the determinants of capital structure and leverage are similar to those of competing capital structure theories. Hence, to infer a precise deduction as to the best theory remains a challenge for capital structure research. This emphasizes the need to develop a methodology which is able to investigate the various capital theories by keeping similar predictions under control. Furthermore, given that there is Australian evidence that suggests the presence of a "hot" market, it implies that there may be some important impact of market timing strategy on the Australian firms' choice of capital structure. Given the lack of Australian studies running "a horse race" between the alternative capital strategy theories, this dissertation aims to providing a timely and advance knowledge of the impact of market timing on a firm's capital structure in the Australian context.

Chapter Three
Methodology & Data

[3.1] Introduction

This chapter describes the research methodology and data used in the main analysis, presented in Chapters 4 and 5 of this dissertation. The chapter begins by outlining the common empirical dilemma faced by capital structure studies running a "horse race" testing competing capital structure theories in Section 3.2. Section 3.3 then describes the formation of the hypothesis and regression models to test the competing capital structure theories. These regression methods are constructed to avoid the common problem that alternative capital theories offer similar predictions on the determinants of leverage. Hence, it is plausible that credible conclusions to which of the capital structure theories explain firm's choice of securities can be arrived at. Section 3.4 describes the additional robustness checks used in Chapter 6. The data sources are introduced in Section 3.5. The definition and formation of the variables for the regressions in Section 3.3 are described in Section 3.6 while Section 3.7 outlines the selection of the sample data for the analysis in Chapter 4 and 5. Lastly, Section 3.8 concludes this chapter.

[3.2] Similar Predictions By Alternative Theories Of Capital Structure

What determines the financing decisions of a company? What triggers the use of debt vis-à-vis issuing equity? Existing empirical evidence on capital structure is mixed presenting a variety of results which does not permit us to draw a consistent picture. This leaves one of the central questions in corporate finance unanswered. Specifically, a reason for the absence of a satisfactory answer is that a number of the theories share the same predictions for the determinants of leverage.[1]

For example, past studies of debt versus equity choice have found that the probability of issuing debt vis-à-vis issuing equity declines with the firm's market-to-book ratio (Hovakimian *et al.*, 2001). This is consistent with the hypothesis that high-growth (high market-to-book) firms have low target debt ratios, while low-growth firms have high target debt ratios (Stulz, 1990). An alternative explanation for this result is the firms time equity issuance to the periods when their market-to-book ratios are high, e.g. because managers believe that shares of such firms are overvalued (Baker and Wurgler, 2002). In this case, it is difficult to draw an inference as to which capital structure theory pertains.[2]

In attempting to answer the central question of "*what determines the financing decisions of a company?*" and *"what triggers the use of debt vis-à-vis issuing equity"*, this dissertation develops a research methodology (outlined in Section 3.3) which allows us

[1] See Sections 2.4 and 2.5 of Chapter 2, for the discussion on the mixed evidence on the various theories of capital structure.

[2] Fama and French (2002) present strong statistical evidence to suggest that the pecking order and trade-off models share a number of common predictions and the attributing causation is hard for them to distinguish which model is present.

to disentangle the predictions of the various theories of capital structure. As mentioned in Section 1.3 of Chapter 1, the understanding of the underlying reason behind the managers' decision of their choice of financing will be useful to institutional and retail investors who may be interested in the return behaviour of their investment. Further, it is also useful to regulators who may need to set regulations to prevent any financing decisions made by firms which may impinge on the efficiency and operation of capital markets.

[3.3] Development Of The Research Methodology

This dissertation will first explore the impact of market timing on determining a firm's capital structure. To avoid the common criticism relating to market timing measurement, Alti's (2006) technique of focusing on a single financing event (i.e the initial public offering (IPO)), in an attempt to capture market timing and its impact on capital structure is employed.

Once a presence of market timing behaviour using IPO data is established, this dissertation will continue to run a "horse-race" to test the various competing capital structure theories to understand which theory can explain the capital structure. In the process, the result of the firm's financing decisions, as well as the determinants of the form of financing, is also analysed. This assists our understanding as to why and when firms choose to use external financing. To mitigate the problem introduced in the preceding section, this dissertation employs empirical techniques which allow direct

testing of the capital structure in a setting where competing theories of capital structure do not share the same predictions.

The use of IPO sample allows this research to capture the impact of market timing. By extending the data sample to include listed firms in the stock exchange that were not floated for the first time during the sampling period however, allows a more robust inference than that obtained using just the IPO data.

The detailed discussions of the research methodology employed in this dissertation are now outlined in the next two sub-sections.

[3.3.1] Tests Of Market Timing

As mentioned in Chapter 2, the tendency of firms to issue equity when the cost of equity capital appears to be temporarily low is well documented by past US studies. Furthermore, studies on market valuations around equity issues are also complemented by other findings such as the long-run under-performance of issuers and by survey results of managers (see Section 2.5.3 of Chapter 2 for a detailed review of evidence on market timing). However, there is a lack of Australian studies exploring directly the impact of market timing on the Australian firms' capital structure. As such, this dissertation first examines the impact of market timing on the capital structure of Australian firms.

The Australian regulatory system is similar to that of the United States and any difference in the findings is therefore unlikely to be a function of such differences. Further, recent analysis has indicated that the Australian capital market functions as if it is simply an offshore branch of the American market (Durand *et al.*, 2006).[3] In addition, Fan *et al.* (2004) demonstrate that American and Australian firms have similar capital structures. Such integration and similarity in the capital structure of firms suggests that the markets' responses to corporate events may be similar in both America and Australia and, as such, a study using Australian samples offers a potentially instructive "hold-out" sample to critically appraise the findings in American studies.

While the collective past evidence makes a strong case for the presence of market timing attempts, to quantify their impact on financing activity is difficult. In particular, most direct tests of market timing are based on the positive relationship between the firms' market valuations (such as market-to-book ratios) and their equity issues. However, the technique of identifying market timers as those firms which have a history of raising securities at high market-to-book ratios is often subject to criticism relating to the market timing measurement. Alti (2006) for example, argues that a history of concurrent increases in external funding needs and the market-to-book ratio is likely to proxy for underlying firm characteristics, most notably the long-term growth traits which dictate low optimal leverage ratios. However, to the extent that contemporaneous control variables are noisy proxies for these firm characteristics, a spurious relationship between history and capital structure may be found in empirical analyses and produce

[3] Additional evidence of market integration is provided by Ragunathan *et al.* (1999) and Durand *et al.* (2001).

misleading inferences. Therefore, the need to isolate market timing is especially important in analysing its long-term effects on leverage.

Also, the positive relationship between the firms' market-to-book ratios and their equity issues may be due to a host of other factors (other than market timing impact) that affect financing policy. For example, firms with growth opportunities which typically have high market values relative to book assets, may use relatively more equity financing to maintain financial flexibility (Alti, 2006). Hence, to avoid potential Type II errors[4] by using market-to-book as a proxy to capture any market timing behaviour in Australia, the analysis in Chapter 4 first explores the impact of market timing on Australian IPO companies by isolating timing attempts following Alti (2006).

There is an unusual and distinguishing phenomenon regarding IPO issuance (i.e. "hot" markets and underpricing). As such, using IPO samples can assist this dissertation to examine the unique behaviour of leverage around the IPO, which is itself an important financing decision that is known to be related to the market-to-book ratio (a proxy for mis-pricing and growth opportunities). Alti (2006) argues that the IPO market constitutes a natural experiment with which to analyse market timing for a number of reasons:

(1) Going public is arguably the single most important financing event in the life of a public firm. Therefore, the payoff from correctly timing the IPO, whether real or as perceived by the issuer, is relatively high;

[4] Type II error consists in accepting a false hypothesis.

(2) Investors face more uncertainty and a higher degree of asymmetric information in valuing IPO firms than they do, in the case of mature public companies. IPOs hence, offer more room for mis-valuation, which is the root of timing considerations; and

(3) Most importantly, timing attempts are nowhere more apparent than in the IPO market.

Perhaps as a result of the first two reasons suggested above, cycles in IPO volume are much more pronounced and pervasive than cycles for other types of financing activity (i.e. there appear to be two distinct regimes characterised as either "hot" or "cold"). Hence, the IPO sample is likely to be highly revealing of pure market timing effects which are distinct from the effects of individual firm characteristics.

Consequently, Alti (2006) argues that in the IPO context, market timing has two related implications:

(1) Firms are more likely to go public when entrepreneurs perceive market conditions to be favourable; and

(2) Firms which go public when the market is favourable are likely to sell more equity than they would have, had they gone public when the market conditions were unfavourable.

To capture the favourable market conditions, the "hot" month for issuing IPOs is constructed. The definition of a "hot" month in this dissertation is based on the monthly IPO volume across the sample period. To smooth out any seasonal variations, a three-month centred moving average of the number of IPOs for each month is conducted.

Thereafter, "hot" months are then defined as those that are above the median[5] of the distribution of the monthly moving average IPO volume across all the months in the sample. "Cold" months are those that are equal or below the median.

Once the "hot" and "cold" months are identified, the rest of the steps to test the impact of market timing in Australia are as follow:

(1) Establish any significant differences in the amounts of equity issued by "hot" versus "cold" market firms;

(2) Establish any link between timing and "hot" markets by trying to capture the "hot" market effect; and

(3) Examine the capital structure implications of market timing.

[3.3.1.1] Do "Hot" Markets Reflect Timing Attempts?

Separating the data into "hot" market IPO firms and "cold" market IPO firms, this dissertation first examines the market timing effects on equity issue activity to determine if "hot" market firms take advantage of the market conditions to issue more equity (as predicted by the market timing hypothesis). In this dissertation, the amount of equity issued at the IPO year is measured as *Total IPO proceeds divided by IPO year-end total assets*. Alti (2006) on the other hand, split his total IPO proceeds into primary and secondary shares held by insiders (i.e. existing shareholders before public listing) from the total shares sold during the IPO exercise. Australia data however, does not allow such segregation into primary or secondary shares.

[5] In Chapter 4, the median is reported at 7.667.

The means of the proceeds between the "hot" and "cold" market firms are first compared, then an ordinary least square (OLS) regression is run to control for any difference in the means which may be driven by other factors other than market timing: the "hot" market effect on the amount of equity issued can potentially be due to differing characteristics of "hot" versus "cold" market firms (see Section 4.3.2 of Chapter 4 for more detailed discussion).

$$Proceeds_t = c_0 + c_1 HOT + c_2 M/B_t + c_3 EBITDA/A_{t-1} + c_4 SIZE_{t-1} \quad \textit{Equation 3.1}$$

$$+ c_5 PPE/A_{t-1} + c_6 (D/A)_{t-1} + c_{IndDummies}\, IndustryDummies + \varepsilon_t$$

where:

HOT represents the "hot" IPO dummy;

M/B is a proxy for the market performance of the firm at time t;

EBITDA/A is a proxy for the profitability of the firm at time t-1;

SIZE is a proxy for the size of the firm at time t-1;

PPE is a proxy for the asset tangibility of the firm at time t-1;

D/A is a proxy for the book leverage of the firm at time t-1; and

Industry Dummies represent the various Global Industry Classification Standard (GICS) on a 2 digit sector.

In particular, firms are classified into the sector of

(1) Energy (GICS code of 10);

(2) Materials (GICS code of 15);

(3) Industrials (GICS code of 20);

(4) Consumer discretionary (GICS code of 25);

(5) Consumer staples (GICS code of 30);

(6) Health care (GICS code of 35);

(7) Financials (GICS code of 40) ;

(8) Information technology (GICS code of 45);

(9) Telecommunication services (GICS code of 50); and

(10) Utilities (GICS code of 55)

However, this dissertation excludes samples which belong to the classification of financials (GICS code of 40) because due to the nature of their business, their capital structures are representative of very different influences (i.e. banks have high leverage simply due to holding customers' deposits) – more discussion on the exclusion of these firms in the Section 3.7.

As discussed in Section 2.4 of Chapter 2, previous research has identified the above independent variables in Equation 3.1 as the main determinants of financing policy (Titman and Wessels, 1988 and Rajan and Zingales, 1995). The definition of these variables will be specified later in Section 3.6.

[3.3.1.2] Comparison Of "Hot" And "Cold" Market Firms

Even if the results obtained from Equation 3.1 in the preceding section find evidence which supports the market-timing hypothesis, there could be two other reasons which may explain why the "hot" market firms issue more equity than the "cold" market firms, other than the window of opportunity reasoning:

(1) The over-leverage hypothesis: The first reason may be that firms may be over-leveraged before going public. Accordingly, the IPO may represent an attempt to revert back to their leverage targets. If this is true, then the *HOT* variable merely captures those "hot" market firms who are issuing equity to adjust their capital structure. Hence, any prima facie evidence of market timing may mask the underlying reason for the decision to raise funds; and

(2) The growth opportunities hypothesis: The second explanation argues that "hot" market firms issue equity to exploit growth opportunities; "Hot" market firms grow faster. If "hot" market firms invest at higher rates, or expect to do so in the near future, then they are likely to finance part of this growth by raising equity capital. If this is true, then the *HOT* variable simply captures those firms who are issuing equity because they have more investment opportunities than firms issuing equities in "cold" markets.

To test the over-leverage hypothesis and the growth opportunities hypothesis, a series of OLS regressions are run using the follow format:

$$Y_t = c_0 + c_1 HOT + c_2 M/B_{IPO} + c_3 M/B_{t-1} + c_4 EBITDA/A_{t-1} + c_5 SIZE_{t-1} \quad \textit{Equation 3.2}$$

$$+ c_6 PPE/A_{t-1} + c_{IndDummies}\, Industry\ Dummies + \varepsilon_t$$

The dependent variable (Y_t) is varied while the independent variables are held constant. Specifically, to test the over-leverage hypothesis, the dependent variable is set as pre-IPO book leverage. If "hot" market firms raise more funds than their "cold" market counterparts to adjust their over-leveraged position, then we should find the pre-IPO

book leverage of the "hot" market firms to be statistically higher than that of the "cold" market firms.

To test the growth opportunities hypothesis, the dependent variables are set as the investment rates for the years IPO, IPO+1 and IPO+2 respectively. If "hot" market firms issuing equity because they have more investment opportunities than firms issuing equities in "cold" markets, then we should find that the investment rates for the "hot" market firms are higher than that of the "cold" market firms.

If there is no evidence suggesting that "hot" market firms deviate from their leverage compared to that of the "cold" market firms at pre-IPO or that "hot" market firms are issuing equity because they have more investment at the IPO year and beyond compared to that of their "cold" market counterparts, then both the over-leverage and growth opportunities hypotheses will be rejected. Therefore, the "hot" effect of issuing more equity is due to market timing strategy.

The market timing hypothesis can be further tested by re-running OLS regressions for Equation 3.2, but replacing the dependent variable by a profitability measure for the years IPO, IPO+1, IPO+2 and IPO+4 over the same set of independent variables. A significant negative correlation between profitability and the *HOT* dummy is a justification for the window of opportunity hypothesis whereby favourable market conditions may trigger IPOs of less profitable firms if these firms find it difficult to go public when the IPO market is less active.

[3.3.1.3] Short-Term Impact Of Market Timing

If market timing behaviour is practiced by managers when deciding on their capital structure, then the impact of market timing on the capital structure, in particular leverage, in the IPO year is likely to be negative. Firms will issue less debt and more equity for external funds to take advantage of the favourable market condition (to issue equity).

To determine the short term impact of market timing on the capital structure of the sample firms, an OLS regression analysis is conducted to see if such a negative relationship is present using Equation 3.3:

$$Y_t = c_0 + c_1 HOT + c_2 M/B_t + c_3 EBITDA/A_{t-1} + c_4 SIZE_{t-1} + c_5 PPE/A_{t-1} \quad \textit{Equation 3.3}$$

$$+ c_6 (D/A)_{t-1} + c_{IndDummies}\, Industry\ Dummies + \varepsilon_t$$

The dependent variables (Y_t) are the book leverage and the change in book leverage at IPO. If market timing has a short-term impact on capital structure, a statistically significant negative relationship will exist between the dependent variables and the *HOT* dummy.

[3.3.1.4] Persistency Of The Market Timing Impact

Alti (2006) finds that the short-term impact of the market timing attempts on capital structure is negative. "Hot" market firms experience a bigger decline in their leverage ratios in the IPO year. Also, their leverage levels cannot be explained by the underlying

firm characteristics. The negative impact quickly reverses, however. Immediately following their IPO, "hot" market firms start issuing significantly more debt and less equity than "cold" market firms do. As a result of this seemingly active reversal policy, the leverage ratios of "hot" market firms increase significantly in the two years following the IPO. In contrast, "cold" market firms appear to be "content" with the leverage ratios they attain at the IPO. By the end of the second year, the "hot" market effect on leverage completely vanishes. Overall, the results show that market timing is an important determinant of financing activity in the short run, but its long-run effects are limited.

To test any persistency effect, a series of OLS regressions can be run on the cumulative change in leverage over the previous set of control variables with period *t* being IPO+1, and IPO+2:

$$D/A_t - D/A_{Pre\text{-}IPO} = c_0 + c_1 HOT + c_2 M/B_{t-1} + c_3 EBITDA/A_{t-1} \qquad \textit{Equation 3.4}$$

$$+ c_4 SIZE_{t-1} + c_5 PPE/A_{t-1} + c_6 (D/A)_{t-1}$$

$$+ c_{IndDummies}\, Industry\ Dummies + \varepsilon_t$$

If market timing has a permanent effect on leverage, then the cumulative change in leverage from its pre-IPO level should continue to reflect the "hot" market effect in the years after the IPO year. However, one concern is a potential inter-relationship between the *HOT* dummy and the market-to-book ratio in the IPO year. It may be the case that both variables capture the market timing effect in the IPO year, but the market-to-book ratio does a better job of reflecting the persistence of this effect. Since both variables are

included in Equation 3.4, the *HOT* dummy may turn out to be insignificant in subsequent years to the IPO even though the market timing effect is not reversed. To be more specific, for the year IPO+1, M/B_{t-1} is the same as the market-to-book ratio in the IPO year; for IPO+2, M/B_{t-1} is different from the IPO-year market-to-book. To address this concern, following Alti (2006), the persistence regression 3.4 can be re-run without the market-to-book ratio as a robustness check.

[3.3.2] A Horse Race: Which Is The Best Of The Competing Theories

The research methodology used to test the market timing hypothesis is described in Section 3.3.1. Once the impact of market timing on capital structure is explored, this dissertation compares the competing theories of capital structure to see which theory best describes the financing behaviours of Australian firms.

To mitigate the problem of alternative theories of capital structure having similar predictions mentioned in Section 3.2, the analysis of dual issues[6] (as advanced by Hovakimiam *et al.,* 2004) against debt/equity issues is used to allow an inference to be drawn. In summary, Hovakimian *et al.* (2004) argue that the analysis of dual issues offers two benefits to the studies of capital structure:

(1) An opportunity to test the effects of firm profitability on leverage in a setting where capital structure theories do not share the same predictions; and

[6] Dual issues refer to the concurrent issue of both equity and debt by a firm. See Section 3.3.2.1 for the discussion on the derivation of such issuers

(2) Dual issues can be incorporated as an additional issue type into the traditional debt versus equity choice analysis.

When analysing the trade-off versus the pecking order theories, concentrating on dual issuers eliminates observations with passive changes in leverage. Therefore, we do not have a leverage–profitability relation simply because of accumulation of earnings and losses. Furthermore, because dual issuers are able to issue both debt and equity, they have a rare opportunity to reset their capital structure at a relatively low cost.[7] Therefore, firms which follow a dynamic[8] trade-off strategy will choose amounts of new debt and equity so that the deviation from the target induced by accumulation of earnings and losses is offset and the resulting debt ratio is closer to the target. As a result, a negative relationship between profitability and leverage will no longer hold. In contrast, if firms follow pecking order, then a negative relationship between profitability and leverage will persist because such firms have no incentive to offset the effects of profitability on leverage.

Introducing dual issues into the analysis also improves the researchers' ability to discriminate between alternative interpretations of the effects of market-to-book on the debt versus equity choice. By comparing dual issuers to debt issuers and, separately to

[7] When the sole reason for issuing debt or equity is to adjust the capital structure, the resulting debt ratio can be expected to be close to the target. However, when firms issue securities (debt or equity) to finance investment projects, the size of the issue is determined by their financing needs. In such a case, firms have to issue a mix of debt and equity for their post-issue debt ratio to be close to the target.

[8] Dynamic models of capital structure introduce transaction costs that generate short-run pecking order behaviour. However, these models also suggest that firms will periodically re-adjust their capital structures toward a target ratio that reflects the costs and benefits of debt financing as found in the static trade-off model. In particular, the models suggest that firms repurchase equity after their share prices increase to adjust toward an optimal capital structure. However, this characterisation is inconsistent with the observation that firms tend to issue equity following stock price increases.

equity issuers, Hovakimian *et al*. (2004) argue that it is possible to discriminate between these alternative hypotheses. The pecking order and the market timing hypotheses imply that firms issue equity when their market performance is high. This prediction applies equally to dual issues, given that dual issues are defined as issues of both debt and equity. Because both equity issuers and dual issuers are expected to time the market by issuing in periods of high market performance, market timing effects should be insignificant in the dual versus equity issue regressions. In other words, dual versus equity issue regressions allow Hovakimian *et al*. (2004) to examine the effect of market performance on the choice of the form of financing while holding market timing constant. Therefore, differences in market performance observed between dual issuers and equity issuers can be attributed to the trade-off hypothesis.

Hovakimian *et al.*(2004) outlined the various theories' predictions when analysing dual issuers against the rest of the issuers and these can be summarised easily in the format used in Table 3.1.

Table 3.1: Determinants Of The Form Of Financing – Summary Of The Hypotheses

Model	Variable	Hypothesis		
		Trade-Off	Pecking Order	Market Timing
Dual Vs. Equity	• Market performance • Profitability	• Negative • positive	• no effect • no prediction	• no effect • no prediction
Debt Vs. Dual	• Market performance • Profitability	• Negative • positive	• negative • no prediction	• negative • no prediction

[3.3.2.1] Grouping Of Firms

This dissertation groups the sample Australian IPO firms by their post-IPO capital raising activities into issuers of debt, equity and dual issuers (those who issue debt and equity concurrently) and firms which do not issue debt or equity. In grouping firms into those that do not issue debt or equity, this dissertation therefore assumes that not raising capital (that is, having a passive capital structure strategy) is also a decision undertaken by a firm's management. These four capital raising activities represent the entire set of strategies open to firms.[9]

Similar to Hovakimian *et al.*(2004), the firm-year observations are grouped in the following manner: a firm-year observation is defined as issuing equity (debt) when net equity (debt) issued exceeds 5% of the book value of the total assets.[10] Dual issuers are defined as instances when firms issue both debt and equity in the same fiscal year whereas passive issuers (i.e., non issuers) are firms which do not fit into any of the above three categories.

[3.3.2.2] Determinants Of Firm Leverage

Once the firms are grouped into the various categories of issuers, the determinants of firm leverage are first analysed to see how the various theories of capital structure can

[9] Another capital raising strategy is to issue hybrid securities such as convertible debt. In this dissertation, convertible issues are not captured separately from the four capital raising activities (issuers of debt, equity, dual issuers and firms that do not issue debt or equity). If a sample firm issue only a convertible debt in a fiscal year, the firm will be grouped as a debt issuer (if the net debt issued exceeds 5% of the book value of the total assets).

[10] The classifications of equity (debt) issuers do not change when the net equity (debt) figures are scaled by the pre-issue book value of total assets. Therefore, whether or not the dissertation scales the net equity (debt) figures by year-end book value of total assets or by the pre-issue book value of total assets will not affect the inferences drawn by this dissertation.

explain the determinants' relationship with the leverage. As discussed in Chapter 2, most of the empirical evidence (such as Titman and Wessels, 1988 and Rajan and Zingales, 1995) on capital structure arise from studies of the determinants of corporate debt ratios and studies of issuing firm's debt versus equity financing choice (in contrast to this dissertation, which compares issuers of debt, equity, dual issuers and firms which do not issue debt or equity). These studies have identified firm characteristics such as firm size, research and development intensity, market-to-book ratio of assets, stock returns, asset tangibility, profitability and the marginal tax rate as determinants of corporate financing choices. In particular, the effects associated with profitability and the market-to-book ratio have been found to be especially important. These two variables (i.e. profitability and market-to-book ratio) can be used to investigate if the effects of operating and market performance on the firms' financing decisions are due to trade-off, pecking order financing behaviour or market timing.

Hence, to directly test whether market performance and profitability affect the leverage ratio, an OLS regression is run using post-issue leverage as the dependent variable for all types of issuers. The independent variables are similar to that used in the previous equations discussed in this chapter.

$$Post-Issue.Leverage_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} \qquad \textit{Equation 3.5}$$

$$+ \beta_4 PPE_{t-1} + \beta_5 HOT + \beta_{IndDummies} IndustryDummies + \varepsilon_t$$

The *HOT* dummy however, plays a slightly different role compared to the previous sections. While the *HOT* dummy still represents those firms who went IPO during the "hot" market period, the inclusion of it here is to relate how these previous "market timer" firms behave with their financial decisions after their IPOs. According to the window of opportunity hypothesis, firms will take advantage of "hot" market conditions to issue equity rather than debt. If these IPO firms were indeed opportunistic, there is no reason why they should not continue to make use of such strategy in their future raising of capital.

[3.3.2.3] Determinants Of The Form Of Financing

Rather than examining the results of the decisions firms make (that is, the leverage ratio they achieve), the choice of financing is further modelled by running a series of logit regressions where the dependent variable (D_t^*) is a binary observation capturing the choice of financing. Three logit regressions are estimated to allow this dissertation to conduct a "horse race" to determine the best theory among the competing theories of capital structure. In particular, the three regressions modelled are:

(1) The choice between dual issuers versus equity issuers;

(2) The choice between debt issuers and equity issuers; and

(3) The choice between debt issuers and dual issuers.

$$D_t^* = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} \qquad \textit{Equation 3.6}$$

$$+ \beta_5 BookLeverage_{t-1} + \beta_6 HOT + \beta_{IndDummies} IndustryDummies + \varepsilon_t$$

The analysis of the debt versus dual and the dual versus equity issue regressions is useful in discriminating between the trade-off hypothesis and the pecking order-market timing hypothesis (see Table 3.1).

[3.3.3] Extending The Analysis

The research methodology described in Sections 3.3.1 and 3.3.2 is conducted using the data from IPO firms. Given the unusual and distinguishing phenomenon regarding IPO issuance (i.e. "hot" markets and underpricing) as discussed in Section 2.3.3 of Chapter 2, it is debatable that the only use of data from IPO firms may bias towards finding supports for market timing hypothesis. As such, the analysis presented in Chapter 5 extends the methodology to include listed firms in the stock exchange which were not floated for the first time during the sampling period to obtain a more robust inference than that obtained using just the data from IPO firms. Above all, Chapter 5 extends the methodology described in Sections 3.3.2.2 and 3.3.2.3.

The analysis in Chapter 5 begins by testing whether market performance and profitability affect the leverage ratio. An OLS regressing similar to Equation 3.5 is run. However, an additional independent variable - lagged book leverage, is added to form Equation 3.7.

$$Post-Issue.Leverage_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} \qquad \textit{Equation 3.7}$$

$$+ \beta_4 PPE_{t-1} + \beta_5 BookLeverage_{t-1} + \beta_{IPO} IPO$$

$$+ \beta_{IndDummies} IndustryDummies + \varepsilon_t$$

The lagged book leverage is added to the analysis to recognize that the function of current leverage includes a function of previous leverage as well. Furthermore, there is a replacement dummy in Equation 3.7 as compared to Equation 3.5. The *HOT* dummy in Equation 3.5 is replaced by the IPO dummy. This is to control for the IPO firms effect.[11] As argued by Alti (2006), investors face more uncertainty and a higher degree of asymmetric information in valuing IPO firms than they do in the case of more mature public companies. Hence, failure to account for such IPO firms may bias the analysis of capital structure decisions towards market timing.

In addition to estimating Equation 3.7, the analysis in Chapter 5 addresses the possible existence of a target capital structure by calculating the leverage deficit for each firm in each year it appears in the data set. Hovakimian e*t al.* (2001) show that the leverage deficit is, *the difference between the observed debt ratio and a target ratio*, predicted by traditional trade-off variables.[12] This leverage deficit variable can be used to predict whether firms raise new capital with debt or equity. Leary and Roberts (2005) examine whether or not firms move towards their target debt ratios. Their results show that firms tend to rebalance their debt ratios in ways which keep them within an optimal range. Fama and French (2002) construct a similar variable and provide evidence that debt ratios tend to move towards their targets, but at a relatively slow rate.[13]

[11] A number of various statistics tests are also performed to ensure that the inferences made in Chapter 4 and 5 are robust. See Chapter 6, "Robustness tests", for the full discussion.
[12] See Table 2.1 of Chapter 2, "Literature review on capital structure", for the determinant variables and their relationship with leverage under the trade-off theory.
[13] Flannery and Rangan (2006) offer a different specification that suggests that debt ratios tend to move towards their target ratios at a rate that is substantially faster than the rate estimated by Fama and French (2002).

Therefore, the construction of the leverage deficit allows this dissertation to test if firms have a target ratio. The leverage deficit is constructed using a partial adjustment regression.[14] There are two stages involved in this regression. The first stage involves estimating the target leverage for each firm-year observation using a Tobit model, regressing the book leverage on variables which have been found to be important determinants of financing policy.[15]

$$BookLeverage_t(L_t) = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} \qquad \textit{Equation 3.8}$$

$$+ \beta_4 PPE_{t-1} + \beta_5 BookLeverage_{t-1} + \beta_{IPO} IPO$$

$$+ \beta_{IndDummies} IndustryDummies + \varepsilon_t$$

The Tobit Model was proposed by Tobin (1958) to describe the relationship between a non-negative dependent variable y_i and an independent variable (or vector) x_i. The model supposes that there is a latent (i.e. unobservable) variable y_i^*. This variable linearly depends on x_i via a parameter (vector) β which determines the relationship between the independent variable (or vector) x_i and the latent variable y_i^* (just as in a linear model). In addition, there is a normally distributed error term u_i to capture random influences on this relationship. The observable variable y_i is defined to be equal to the latent variable whenever the latent variable is above zero and zero otherwise.

[14] Jalilvand and Harris (1984) and Auerbach (1985) are some of the pioneers that use partial adjustment models. See Greene (2003) page 568 for the general discussion of partial adjustment model.
[15] Again, see the discussion of Titman and Wessels (1988) and Rajan and Zingales (1995) in Chapter 2 for the determinants of financing policies.

$$y_i = \begin{cases} y^* \ if \ y_i^* > 0 \\ 0 \ if \ y_i^* \le 0 \end{cases}$$

where y_i^* is a latent variable:

$$y_i^* = \beta x_i + \mu_i, \mu_i \sim N(0, \sigma^2)$$

If the relationship parameter β is estimated by regressing the observed y_i on x_i, the resulting ordinary least squares estimator is inconsistent. Amemiya (1973) however, has proven that the likelihood estimator suggested by Tobin for this model is consistent.[16]

This dissertation acknowledges that a firm's target leverage ratio can not be observed directly (unless such information is provided by the firm). Rather, one can only observe what firms do and seek to derive general principles. Therefore, the target leverage obtained from the Tobit model may not be the actual target leverage for a firm (which, in reality, would only be known by asking the firm's management about any target they may have). The success of these generalisations however, may be gauged by the accuracy of the model. Given however, that the adjusted R-square of the Tobit regression is 68.2% (see Table 5.4 in Chapter 5), the model appears to enjoy good explanatory power. This suggests that the Tobit regression is a good model and the predicted target leverage is a good proxy to the actual target.

Although there are other means to estimate the target leverage such as using industry leverage average, since the Tobit regression is adjusted for industry effect, this

[16] A full discussion about the Tobit model can be found in Tobin (1958) and Amemiya (1973).

dissertation does not take the route of using industry leverage average as a proxy. The use of industry leverage average may result in the clustering of the target leverage for sample observations in the same industry. Using the Tobit regression in contrast, estimates the predicted target leverage for individual firms in the sample.

From Equation 3.8, the target proxy is obtained to tabulate the leverage deficit. The second stage is to re-estimate Equation 3.7 by replacing the lagged book leverage with the leverage deficit to form Equation 3.9 where the leverage deficit is the observed value of L_t less the predicted value of $\hat{L}_t$ obtained from Equation 3.8.

$$Post-Issue.Leverage_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} \quad \textit{Equation 3.9}$$

$$+ \beta_4 PPE_{t-1} + \beta_5 LeverageDeficit_{t-1} + \beta_{IPO} IPO$$

$$+ \beta_{IndDummies} IndustryDummies + \varepsilon_t$$

As discussed in Chapter 2, Shyam-Sunder and Myers (1999) find that firms with higher financial deficits[17] (FD) (i.e. firms which raise more external capital) tend to increase their leverage. This behaviour is consistent with Myers and Majlufs' (1984) adverse selection model. Hence, to further test the theory of pecking order, the financial deficit for each firm-year observation is predicted. When this deficit is positive, the firm invests more than it internally generates. When it is negative, the firm generates more cash than it invests and has a positive free cash flow. The pecking order theory predicts that firms with higher financial deficits (i.e firms that raise more external capital), tend

[17] See Equation 3.14 in page 91 for definition of financial deficit.

to increase their leverage. This is consistent with the adverse selection theory- a central part of the pecking order theory. Hence, the financial deficits are incorporated into Equations 3.7 and 3.9 in the regressions to form Equations 3.10 and 3.11 as given below. Furthermore, Kayhan and Titman (2007) suggest that information issues involved in a share repurchase might not be the same as those involved in a share issuance. However, adding a dummy variable to interact with the financial deficit can control for any asymmetric effect on the debt ratio. Therefore, a control dummy variable is included in Equation 3.10 and 3.11 which takes a value of 1 when the financial deficit is positive and 0 otherwise.

$$Post-Issue.Leverage_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} \quad \textit{Equation 3.10}$$
$$+ \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 BookLeverage_{t-1}$$
$$+ \beta_{IPO} IPO + \beta_6 FD_{t-1} + \beta_{FD} FDDummy$$
$$+ \beta_{IndDummies} IndustryDummies + \varepsilon_t$$

$$Post-Issue.Leverage_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} \quad \textit{Equation 3.11}$$
$$+ \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 LeverageDeficit_{t-1}$$
$$+ \beta_{IPO} IPO + \beta_6 FD_{t-1} + \beta_{FD} FDDummy$$
$$+ \beta_{IndDummies} IndustryDummies + \varepsilon_t$$

The analysis in Chapter 5 also extends the methodology described in Section 3.3.2.3. In particular, this extension seeks to model the financing choices made by the Australian

firms by running a series logit regressions similar to Equation 3.6. Similarly, the *HOT* dummy is replaced by an IPO dummy to form Equations 3.12 and 3.13.

$$D_t^* = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} \quad \textit{Equation 3.12}$$
$$+ \beta_5 BookLeverage_{t-1} + \beta_{IPO} IPO + \beta_{IndDummies} IndustryDummies + \varepsilon_t$$

$$D_t^* = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} \quad \textit{Equation 3.13}$$
$$+ \beta_5 LeverageDeficit_{t-1} + \beta_{IPO} IPO + \beta_{IndDummies} IndustryDummies + \varepsilon_t$$

[3.4] Additional Robustness Checks

A number of various statistic tests are performed to ensure that the inferences made on the basis of the previous analyses are robust. These tests are conducted with the results discussed in Chapter 6.

[3.4.1] Possible Correlations Of Firm-Year Observations

Equations 3.5 and 3.6 investigate the determinants of firm leverage and the determinants of the form of financing by the various firms. Given the possibility of correlations between firm-year observations within a sample IPO firm itself, a repeat dummy is added to both equations to control for firms that have more than one firm-year observation within the sample.

$$Post-Issue.Leverage_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} \quad \textit{Equation 3.5a}$$

$$+ \beta_4 PPE_{t-1} + \beta_5 HOT + \beta_{IndDummies} IndustryDummies$$

$$+ \beta_{RD} \mathrm{Re}peat + \varepsilon_t$$

$$D_t^* = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} \quad \textit{Equation 3.6a}$$

$$+ \beta_5 BookLeverage_{t-1} + \beta_6 HOT + \beta_{IndDummies} IndustryDummies$$

$$+ \beta_{RD} \mathrm{Re}peat + \varepsilon_t$$

Repeat dummy take the value of 1 if a firm has more than a firm-year observation in the sample, 0 otherwise. Table 3.2 presents an example of the grouping of the repeat dummy. The example assumes that there are 5 firms with a total of 9 firm-year observations which are considered to be dual issuers in the following way:

Table 3.2: Example On The Classification Of A Repeat Dummy

	IPO Year	IPO+1	IPO+2	Repeat Dummy
Firm A	Dual	Dual	Dual	1
Firm B		Dual		0
Firm C			Dual	0
Firm D	Dual		Dual	1
Firm E		Dual	Dual	1

The repeat dummy will then be allocated as in the above table.

[3.4.2] Panel (Unbalanced) Analysis

Results obtained from Equations 3.5 to 3.7 and Equations 3.9 to 3.13, are from an unbalanced data. Hence, a panel (unbalanced) analysis is conducted for all the various regressions conducted previously as a robustness check against the inferences obtained in Chapters 4 and 5. A detailed discussion on the use of panel data is outlined in Chapter 6.

[3.5] Data Sources

The analysis reported in Chapters 4 and 5 uses the yearly accounting data from companies listed on the Australian Securities Exchange (ASX) between 1993 and 2005. These listed companies include those which were listed for the first time during the sample period. These initial public offering firms are identified from the "ASX Historical Float Register" published in *The Float Report* provided by ASX. However, ASX ceased to produce the report in July 2004. Hence, the rest of the historical listing records are obtained from the website of InvestSMART Financial Services Pty Ltd.

The annual accounting data is obtained from Aspect's FinAnalysis. Where financial year-end share prices are not available from FinAnalysis, the missing prices are obtained from the Share Price & Price Relative (SPPR) database complied by the Centre for Research in Finance (CRIF) and the Australian Graduate School of Management (AGSM) at the University of New South Wales (UNSW). Other detailed firms' information including the country of incorporation, principal activity, list of overseas exchanges in which the firms are listed on and dates of delist are obtained from various

sources, including Aspect's DatAnalysis, CONNECT4, deListed and the individual firm's website.

[3.6] Formations Of The Variables

The definition of the variables used in this dissertation follows those used in prior studies (including Baker and Wurgler, 2002; Fama and French, 2002; and Alti, 2006). In keeping with prior studies, some of the variables are scaled by the fiscal-year end total assets. Further, all the variables are derived using the balance sheet approach. Fama and French (2005) argue that this approach is better than the net cash flow approach. Take the definition of net equity issues for example, if the net cash flow approach is used, such an approach does not take into account the equity issue which involves no cash flows, such as grants of stock to employees and stock acquisition. Table 3.3 describes the definition of all the variables used in this dissertation.

This dissertation defines book debt (D) as "*total assets minus book equity*" while book equity (E) is defined as "*balance sheet retained earnings plus paid in share capital*". Book leverage (D/A) is then defined as "*book debt divided by total assets*". In this dissertation, due to IPO data limitations, the leverage is measured in terms of book value rather than market value. However, Bowman (1980) demonstrates that the cross-sectional correction between the book value and market value of debt is very large, so the misspecification due to using book value measures is probably fairly small (Titman and Wessels, 1988 page 7).

Table 3.3: Definition Of Variables

Variables		Definitions
Book Debt **(D)**		Total Assets minus Book Equity
Book Equity **(E)**		Balance Sheet Retained Earnings plus Paid In Share Capital
Book Leverage **(D/A)**		Book Debt divided by Total Assets
Market-to-book ratio **(M/B)**		(Book Debt plus Market Equity) divided by Total Assets
Market equity **(MV)**		Common Shares Outstanding multiplied by Share Price
Net debt issues **(d/A)**		Change In Book Debt divided by Total Assets
Net equity issues **(e/A)**		(Change In Book Equity minus Change In Retained Earnings) divided by Total Assets
Newly retained earnings **(RE/A)**		Change In Retained Earnings divided by Total Assets
Profitability **(EBITDA/A)**		(Earnings Before Interest, Taxes, And Depreciation) divided by Total Assets
Firm Size **(SIZE)**		Operating Revenue divided by Total Assets
Asset Tangibility **(PPE/A)**		Net Plant, Property And Equipment divided by Total Assets
Investment **(INV/A)**		(Current plus Non-Current Investments) divided by Total Assets
Dividend **(DIV/E)**		Ordinary Dividend divided by Year End Book Equity
Cash **(CASH/A)**		(Cash And Current Investments) divided by Total Assets
Post-Issue Leverage		(Pre-Issue Debt + Net Debt Issued)/(Pre-Issued Assets + Net Debt Issued + Net Equity Issued)

Market-to-book ratio (M/B) is used to proxy for a firm's market performance indicator and is defined as "*the result of book debt plus market equity divided by total assets*". Market equity (MV) is defined as "*common shares outstanding times share price*". Net debt issues (d/A) is the "*change in book debt divided by total assets*", whereas net equity issues (e/A) is the "*result in the change in book equity minus change in retained earnings dividend by total assets*". Newly retained earnings (RE/A) is the "*change in retained earnings divided by total assets*", while profitability is measured by EBITDA/A which is "*earnings before interest, taxes, and depreciation divided by total assets*". Firm size (SIZE) is measured by "*operating revenue divided by total assets*" and asset tangibility (PPE/A) is defined as "*net plant, property, and equipment divided by total assets*". Investment (INV/A) is "*the result of current plus non-current investments divided by total assets*" while dividend (DIV/E) is "*ordinary dividend divided by year end book equity*". Cash (CASH/A) is defined as "*cash and current investments divided by total assets*" and finally, post-issue leverage is the "*sum of pre-issue debt plus net debt issued divided by the sum of pre-issued assets and net debt issued and net equity issued*".

As defined by previous studies (Shyam-Sunder and Myers, 1999; Frank and Goyal, 2003 and Kayhan and Titman, 2007), financial deficit (FD) is the net amount of debt and equity the firm issues or repurchases in a given year. It can be calculated as the sum of investment (I), dividends (D) and changes in working capital (ΔWC) less the net of cash flow (CF). This is identical to net debt issues (Δd) plus net equity issues (Δe).

$$Financial Deficit(FD) = \Delta WC + I + D - CF \equiv \Delta e + \Delta d \qquad \textit{Equation 3.14}$$

[3.7] Selection Of Data Sample

The analysis in Chapters 4 and 5 excluded financial firms (this category includes property trusts, investment and financial services, banks, finance and real estate firms) from the sample because their leverage is strongly influenced by explicit (or implicit) investor insurance schemes such as deposit insurance. Furthermore, their debt-like liabilities are not strictly comparable to the debt issued by non-financial firms (for example, banks have high leverage simply due to holding customers' deposits). Finally, regulations such as minimum capital requirements may directly affect capital structure.

In keeping with previous studies (i.e., Baker & Wurgler, 2002; Alti, 2006), firm-year observations that are outliers with regard to various firm characteristics are also dropped if one of two conditions are met:

(1) Firm-year observations where market to book ratio (M/B) exceeds 10.0 are excluded; and

(2) Firm-year observations where book leverage, net debt/assets (d/A), net equity/asset (e/A), newly retained earnings (RE/A), earnings before interest, taxes and depreciation/assets (EBITDA/A), Investment/Assets (INV/A) or dividend/book equity (DIV/E) exceed 100% in absolute terms are also excluded.

In addition, the analysis in Chapter 4 also excludes privatized public sector entities, spin-offs, companies formed through a scheme of arrangement, firms which are foreign owned or affiliated with a foreign company, firms which are listed or registered on a foreign stock exchange prior to being listed on the ASX, and firms which had been previously listed on the ASX (e.g. in January 1992 the companies who were still trading

on the 'second board' were transferred to the ASX main board). These firms' capital structures are potentially subject to many external factors that are not related to the hypotheses predicted by the theories of capital structure. For example, firms which are foreign owned may have capital structures that are influenced by their foreign parent companies (which may be subjected to different institutional rulings from Australia's business environment). The inclusion of such firms may lead to a false inference on the financing behaviours of Australian firms.

[3.8] Conclusion

This chapter outlines the research methodology, the data and their sources and the formation of the variables used in the analyses of this dissertation. The complete data set covers the period 1993-2005.

Firstly, Alti's (2006) technique of isolating timing attempts in a single major financing event - the Initial Public Offering (IPO), to identify market timers is used to test the impact of market timing on Australian IPOs' capital structure. Because of the unusual and distinguishing phenomenon regarding IPO issuance, the IPO data set presents a natural experiment for market timing theory. Secondly, by using the analysis of dual issuers (as advanced by Hovakimian *et al.*, 2004), a horse race among the competing theories of capital structure is run with the intention to draw an inference on which theory best describes the Australia firms.

To obtain a more robust inference than that obtained using just the data from IPO firms, the chapter outlines the extended research methodology to include a data set of all listed Australian firms between 1993 and 2005 and the horse race is once again run for the competing theories. Frank and Goyal (2003) argue that most empirical tests have various weaknesses. It is therefore important to examine the predictions of a theory from a number of points of view rather than relying solely on a single test. Hence in Chapter 5, leverage deficit and financial deficit are added to further test the explanatory power of the trade-off and pecking order theories.

Finally, tests using different statistical techniques (which will be presented in Chapter 6 to test the robustness of the inferences made in Chapters 4 and 5) are also discussed.

Chapter Four
Capital Structure and the Use of Market Timing - The Australian Evidence[1]

"When the ferocious strike of an eagle breaks the body of its prey, it is because of the exact moment and timing of its engagement" – Sun Zi[2]

[4.1] Introduction

Shaping a firm's capital structure is one of the most important decisions a firm must make. Given that the choice of financing mechanisms (the use of internal funds, equity raising or debt issuance) plays a major part in moulding the structure, any decisions made are likely intended to maximize the wealth of the firms. Consequently, managers are likely to achieve wealth maximisation by choosing the choice of financing that will have the lowest cost.

In raising the funds, managers may also choose a timing that will enable them to raise funds in the most favourable market conditions. This behaviour suggests that market timing could be a possible strategy followed by managers when raising funds.

[1] A refereed conference paper adapted from this chapter was presented at the 2006 PhD Conference in Economics and Business held at the Australia National University (Canberra, Australia). Comments from Geoff Kingston and conference participants are gratefully acknowledged. An earlier draft of this paper also benefited from Mark Flannery and other seminar participants at the 2006 Asian Financial Association/Financial Management Association Doctoral Student Symposium (Auckland, New Zealand).
[2] Wee (2003), page 117.

As discussed in Chapter 2, there is empirical evidence supporting the presence of a market timing strategy. In summary, Taggart (1977) represents the first of many studies which demonstrate that firms issue equity when their market valuations are high relative to book values or past market values. Such opportunistic behaviour is also documented in new issue studies where the presence of a "hot" market is often found.[3] Graham & Harvey's (2001) survey finds that two-thirds of American CFOs admit to timing the market when issuing equity. Baker and Wurgler (2002) argue that capital structure is the cumulative outcome of past attempts to time the equity market. Evidence of market timing refutes two of the predominant theories of capital structure: the pecking order theory which argues that information asymmetry and agency costs present managers with a hierarchy of financing options, and the trade-off theory which suggests that managers balance the costs of equity and debt with a view to achieving an "optimal" capital structure. However, the persistence of market timing impact appears to be short-lived. Using data consisting of American initial public offerings to isolate and analyse timing attempts, Alti (2006) concludes that while market timing is an important determinant of financing activity in the short run, a firm's capital structure policy in the long term appears to be largely consistent with the existence of a leverage target.

Using a sample of Australian Initial Public Offering (IPO) firms listed on the Australian Securities Exchange (ASX) between 1993 and 2005, this chapter explores the market timing hypothesis directly by examining the capital structure of these new listings.[4]

[3] Ritter (1984) for example, documents that the monthly average initial returns on unseasoned new issues have been extremely high for prolonged periods. Each of these "hot" issue market periods was followed by a large and prolonged increase in the volume of initial public offerings.

[4] Section 3.3.1 of Chapter 3 discussed the reason behind using the Australian data for this dissertation.

Separating the Australian data into "hot" market IPO firms and "cold" market IPO firms, the market timing effects on issue activity are first analysed to determine if "hot" market firms take advantage of market conditions to issue more equity, as predicted by the market timing hypothesis. The analysis in Section 4.3 demonstrates that, although some characteristics of market timing are observed, there is also a high net debt issue in the IPO year which is at odds with this theory.

Finding that dual issuers (i.e. companies who issue equity and debt concurrently in the same financial year) are common, this chapter continues to explore the determinants of firm leverage to disentangle how competing capital structure theories, especially the market timing hypothesis, can best explain a firms' capital structure. Such examination contributes to our knowledge about the capital structure of Australian firms where there has been a lack of studies exploring the direct market timing impact on the capital structure and a "horse race" testing among the competing theories of capital structure in Australia.[5] The analysis in Section 4.4 confirms that Australian firms are opportunistic fund raisers but that their behaviour is consistent with them having target debt ratios. These targets are consistent with the firms trading-off the costs and the benefits of debt *versus* equity. However, the analysis in Section 4.4 rejects the pecking order theory. Rather, it confirms that market timing strategy is a "means to the end" of achieving a target leverage structure. Market timing is not an end in itself.

[5] Suchard and Singh (2006) is probably the closest Australian study which explores the theories of capital structure. However, while Suchard and Singh (2006) look at the determinants of the hybrid security issuance decision for Australian Firms, they did not test the market timing hypothesis directly like this dissertation.

[4.2] Methodology & Data

Chapter 3 describes the research methodology used in this chapter. In summary, this chapter utilises two methodologies. First of all, the impact of market timing on the Australian IPO companies is explored by isolating timing attempts as suggested by Alti (2006). Finding mixed evidence for the market timing hypothesis, this chapter continues the analysis by testing the various competing capital structure theories to understand which theory can best explain the capital structure of Australian companies. Both the results of the firm's financing decisions as well as the determinants of the form of financing are analysed.

This chapter uses data from companies floated on ASX between 1993 and 2005. A total of 1,436 floats were identified during this period from the floating history supplied by the ASX.[6] Accounting data are obtained from Aspect FinAnalysis to include data prior and post the IPO years. Firm with missing accounting data observations are excluded (this includes samples without pre-IPO data).

As discussed in Chapter 3, financial firms (this category includes property trusts, investment and financial services, banks, finance and real estate firms) are excluded because, due to the nature of their business, their capital structures are representative of very different influences (for example, banks have high leverage simply due to holding customers' deposits).

[6] As mentioned in Section 3.5 of Chapter 3, IPO firms are identified from "The Float Report" provided by ASX and from the floating records maintained by InvestSMART Financial Services Pty Ltd.

Further restrictions are also performed to exclude privatized public sector entities, spin-offs, companies formed through a scheme of arrangement, firms which are foreign owned or affiliated with a foreign company, firms which are listed or registered on a foreign stock exchange prior to being listed on the ASX and firms which had been previously listed on the ASX (e.g. in January 1992 the companies who were still trading on the 'second board' were transferred to the ASX main board.).

A balance of 469 IPOs is available to be analysed (see Table 4.1).

Table 4.1: Number Of IPOs For Analysing

	Samples		
	Initial	**Eliminated**	**Balance**
No. of IPOs (1993 – 2005)	**1,436**		
No. of IPOs eliminated due to • no data or incomplete data from FinAnalysis between 1992 – 2006 (including missing pre and post IPO data)		(728)	
No. of IPOs eliminated due to various firms' characteristic restrictions (i.e., Industry restriction, privatized public sector entities, spin-offs, firms formed through a scheme of arrangement, foreign owed or affiliated with a foreign company, firms listed or registered on a foreign stock exchange prior listing on ASX, and firms previous listed on ASX prior to 1993).		(239)	**469**

In keeping with previous studies such as Baker & Wurgler (2002) and Alti (2006), firm-year observations which are outliers with regard to various firm characteristics are also dropped if one of two conditions are met.

Firstly, the dissertation excludes firm-year observations where market to book ratio (M/B) exceeds 10.0. Secondly, firm-year observations where book leverage, net debt/assets (d/A), net equity/asset (e/A), newly retained earnings (RE/A), earnings before interest, taxes and depreciation/assets (EBITDA/A), Investment/Assets (INV/A) or dividend/book equity (DIV/E) exceed 100% in absolute terms are also excluded.

Table 4.2 illustrates the elimination process for the firm-year observations. In Column 1, the dissertation starts with 469 IPOs with a full data set in the pre-IPO year. Thereafter, the steady attrition of observations in IPO time (i.e. the number of observations decreases from 469 at pre-IPO year to 31 at IPO+7 year) is due to mergers or bankruptcies which cause an exit from our observations. After the exclusion of the outliers, a total of 413 pre-IPO firm-year observations are left for analysing (see Table 4.2).

Table 4.2: Number Of Firm-Year Observations For Analysing

	Samples		
	Initial	**Eliminated**	**Balance**
Firm-year observations on:			
• Pre-IPO year	**469**	(56)	413
• IPO year	**469**	(61)	408
• IPO+1 year	**371**	(50)	321
• IPO+2 year	**295**	(56)	239
• IPO+3 year	**263**	(43)	220
• IPO+4 year	**216**	(44)	172
• IPO+5 year	**138**	(28)	110
• IPO+6 year	**53**	(11)	42
• IPO+7 year	**31**	(5)	26
• IPO+8 year	**24**	(6)	18
• IPO+9 year	**20**	(4)	16
• IPO+10 year	**20**	(5)	15
• IPO+11 year	**9**	(1)	8
• IPO+12 year	**2**	(0)	2
• Total firm-year observations (469 IPO firms)	**2,380**		
• No. of firm-year observations eliminated due to firm-characteristics deemed as outliers		(370)	
• No. of firm-year observations for testing			**2,010**

Table 3.3 in Chapter 3 defines the variables used in this chapter. Also, as mentioned in Chapter 3, the "hot" market is defined based on the monthly IPO volume across the sample period. To smooth out seasonal variations, a three-month centred moving average of the number of IPOs for each month is conducted. Thereafter, "hot" months are then defined as those that are above the median of the distribution of the monthly moving average IPO volume across all the months in the sample. "Cold" months are those that are equal or below the median. Figures 4.1 and 4.2 show the time series of the monthly IPO volumes and moving average of the IPO volumes from 1993 to 2005 respectively. The horizontal lines in figures are the median monthly IPO volume (median of 8.0) and the median monthly moving average IPO volume (median of 7.67) for Figures 1 and 2 respectively.

Figure 4.1 - Time Series Of Monthly IPO volume

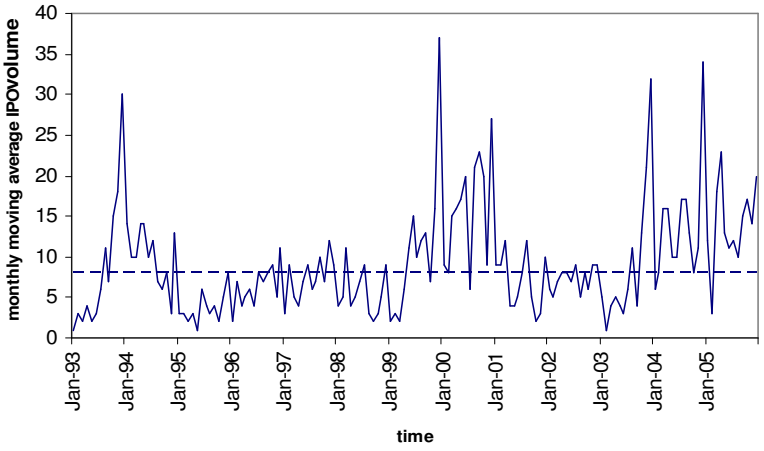
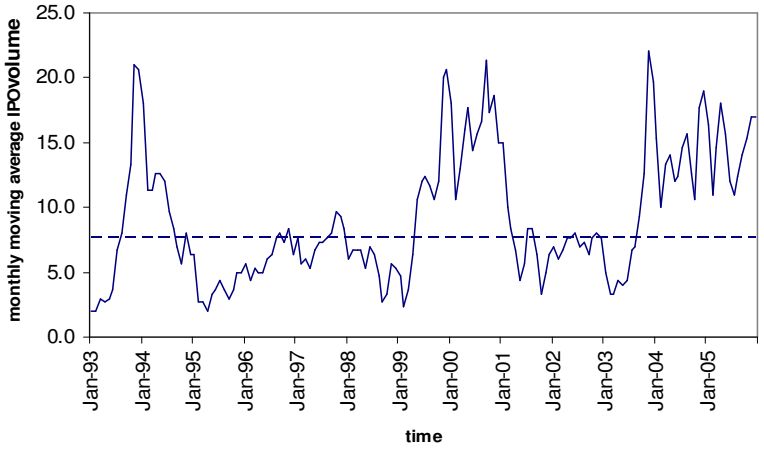


Figure 4.2 - Time Series Of Monthly Moving Average IPO volume



[4.3] Findings

[4.3.1] Summary Statistics Of Firm Characteristics And Financing Decisions

Table 4.3 summarises firm characteristics and financing decisions. The average book leverage of 26% at IPO year is comparable with other Australian IPO studies. For example, How *et al.* (1995) document a mean figure of 22.86% for their sample (debt to total assets). Thereafter, the book leverage increases steadily after the IPO. The t-value for the net debt difference between IPO and IPO+1 year is 3.194 (statistically significant at the 1% level). Such a finding is consistent with Pagano *et al.* (1998) who find that companies can achieve a lower cost of debt once they become listed, therefore they are likely to increase the level of leverage after the IPO year. The market-to-book ratio and the net equity decrease post-IPO year and this is consistent with the market timing hypothesis which suggests that firms who time the market will choose to issue less equity if the market conditions are less favourable for them to do so. Size increases post-IPO year, whereas the investment rate increases slightly and hovers around 4% in the early years after the IPO year. Similar to past American studies as documented by Jain and Kini (1994) and Mikkelson *et al.* (1997), there is a significant reduction in profitability around the IPO year. The "negative" profitability of the IPO firms also persists well beyond the IPO year. The cash balances of these IPO companies are expected to increase with the infusion of new capital in the IPO year, but surprisingly, no such increase is found. Cash balances also steadily decline in subsequent years.

Table 4.3
Summary Statistics of Firm Characteristics and Financing Decisions

The table reports the means and the standard deviations (in brackets) of several firm characteristics in pre-IPO, IPO and post-IPO years. *Book leverage D/A* is book debt to assets. *Net debt Issue d/A* is defined as the change in book debt divided by assets. Net equity Issues e/A is defined as the change in book equity minus the change in retained earnings divided by assets. *Newly retained earnings* $\Delta RE/A$ is the change in retained earnings divided by assets. *Market-to-book ratio M/B* is defined as book debt plus market value of equity divided by assets. Profitability is measured by *EBITDA*, which is earnings before interest, taxes and depreciation divided by assets. *SIZE* is measured by operating revenue divided by assets. *Asset tangibility PPE*, is defined as net plant, property and equipment divided by assets. *INV* denotes capital expenditure (which is proxied by current and non current i*nvestments*) to assets ratios. *DIV* is ordinary dividends divided by book equity. *CASH* is defined as cash and current investments divided by assets. Firm-year observations that consititute outliers with respect to book leverage, market-to-book ratio, net debt, net equity issues, newly retained earnings, profitability, investment and dividends are dropped from the sample.

	N	Book Leverage D/A	Net Debt d/A	Net Equity e/A	Newly Retained Earnings ΔRE/A	Mkt to book ratio M/B	EBITDA	Size	PPE	INV	DIV	Cash
Pre-IPO	413	0.26	-	-	-	-	0.01	0.48	0.10	0.02	0.02	0.46
		(0.29)	-	-	-	-	*(0.17)*	*(0.94)*	*(0.18)*	*(0.08)*	*(0.09)*	*(0.36)*
IPO	408	0.26	0.10	0.17	-0.09	2.13	-0.04	0.55	0.14	0.03	0.04	0.37
		(0.23)	*(0.21)*	*(0.31)*	*(0.20)*	*(1.42)*	*(0.22)*	*(0.92)*	*(0.19)*	*(0.11)*	*(0.11)*	*(0.29)*
IPO+1	321	0.31	0.05	0.15	-0.18	1.94	-0.08	0.71	0.16	0.04	0.03	0.27
		(0.25)	*(0.18)*	*(0.24)*	*(0.27)*	*(1.46)*	*(0.26)*	*(1.08)*	*(0.21)*	*(0.14)*	*(0.08)*	*(0.27)*
IPO+2	239	0.38	0.03	0.15	-0.12	1.86	-0.03	0.93	0.17	0.04	0.04	0.22
		(0.26)	*(0.21)*	*(0.22)*	*(0.22)*	*(1.37)*	*(0.24)*	*(1.21)*	*(0.20)*	*(0.15)*	*(0.10)*	*(0.23)*
IPO+3	220	0.41	0.06	0.14	-0.12	1.84	-0.01	0.98	0.18	0.04	0.04	0.24
		(0.25)	*(0.20)*	*(0.24)*	*(0.23)*	*(1.34)*	*(0.25)*	*(1.20)*	*(0.21)*	*(0.13)*	*(0.09)*	*(0.24)*
IPO+4	172	0.41	0.03	0.15	-0.08	1.94	0.02	1.09	0.19	0.04	0.02	0.22
		(0.24)	*(0.19)*	*(0.25)*	*(0.24)*	*(1.40)*	*(0.26)*	*(1.36)*	*(0.20)*	*(0.12)*	*(0.09)*	*(0.23)*
IPO+5	110	0.48	0.04	0.13	-0.07	1.74	0.04	1.19	0.20	0.04	0.00	0.20
		(0.22)	*(0.21)*	*(0.22)*	*(0.23)*	*(1.08)*	*(0.24)*	*(0.97)*	*(0.20)*	*(0.14)*	*(0.12)*	*(0.20)*
IPO+6	42	0.51	0.00	0.08	-0.03	1.90	0.06	1.18	0.26	0.06	0.02	0.15
		(0.24)	*(0.28)*	*(0.25)*	*(0.30)*	*(1.27)*	*(0.23)*	*(1.20)*	*(0.23)*	*(0.20)*	*(0.12)*	*(0.19)*
IPO+7	26	0.50	0.06	0.11	-0.05	1.66	0.08	1.21	0.32	0.07	0.02	0.08
		(0.26)	*(0.29)*	*(0.24)*	*(0.13)*	*(1.11)*	*(0.14)*	*(1.34)*	*(0.26)*	*(0.17)*	*(0.13)*	*(0.09)*
IPO+8	18	0.49	0.09	0.05	-0.01	1.67	0.09	1.41	0.27	0.01	0.02	0.11
		(0.27)	*(0.26)*	*(0.16)*	*(0.08)*	*(1.29)*	*(0.14)*	*(1.51)*	*(0.22)*	*(0.01)*	*(0.13)*	*(0.11)*
IPO+9	16	0.43	-0.02	0.11	-0.06	1.58	0.03	1.33	0.28	0.01	0.06	0.08
		(0.26)	*(0.12)*	*(0.13)*	*(0.15)*	*(0.79)*	*(0.19)*	*(1.34)*	*(0.25)*	*(0.02)*	*(0.11)*	*(0.07)*
IPO+10	15	0.42	-0.02	0.11	-0.04	1.69	0.07	1.32	0.22	0.01	0.01	0.12
		(0.27)	*(0.26)*	*(0.22)*	*(0.14)*	*(0.67)*	*(0.18)*	*(1.51)*	*(0.24)*	*(0.01)*	*(0.12)*	*(0.18)*

[4.3.2] Do "Hot" Markets Reflect Timing Attempts?

Alti (2006) argues that in the IPO context, market timing has two related implications. Firstly, firms are more likely to go public when entrepreneurs perceive market conditions to be favourable. Secondly, firms that go public when the market is favourable are likely to sell more equity than they would have, had they gone public when the market conditions were unfavourable. The market timing measure of the current analysis, the *HOT* variable, is constructed to test the first question of timing market conditions. This section presents evidence on the second implication by examining the effect of market timing on the amount of equity issued at the IPO.

The market timing effects on issue activity are first analysed to determine if "hot" market firms will take advantage of the market conditions to issue more equity as predicted by the market timing hypothesis. In this dissertation, the amount of equity issued at the IPO year is measured as "*Total IPO proceeds divided by IPO year-end total assets*". As discussed in Chapter 3, Alti (2006) on the other hand, split his total IPO proceeds into primary and secondary shares held by insiders (i.e. existing shareholders before public listing) from the total shares sold during the IPO exercise. Australian data however, does not allow such segregation into primary or secondary shares.

Table 4.4
Market Timing Effects On Issue Activity

For each variable Y_t, Panel A reports the mean value (in percentage) among hot and cold market firms, and the t-value of their difference. The time subscript *t* denotes the IPO year.
Panel B reports the coefficients of OLS regressions of which take the form of

$$Y_t = C_0 + C_1 HOT + C_2 M/B_t + C_3 EBITDA_{t-1} + C_4 SIZE_{t-1} + C_5 PPE_{t-1} + C_6 (D/A)_{t-1} + C_{IndDummies} \text{Industry Dummies} + error_t$$

The T-statistics are in brackets and are adjusted for heteroskedasticity (White, 1980).
The dependent variable Y_t is the total IPO proceeds in the first column and IPO-year net debt issues in the third column, divided by total assets at the end of the IPO year in both columns. The second column is the total IPO proceeds dvided by total assets at the beginning of the IPO year. HOT dummy takes a figure of 1 if the IPO firm was listed on ASX in a hot month, 0 otherwise.The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	Proceeds/Assets$_t$ Proceeds/A_t	**Proceeds/Asset$_{t-1}$** Proceeds/A_{t-1}	**Net Debt Issue$_t$** $(d/A)_t$
Panel A: Mean Values			
Hot	65.26	107.89	10.34
Cold	52.49	84.40	9.67
t-value (difference)[a]	(2.668)***	(1.146)	(0.275)
z-value (difference)[b]	(-2.483)**	(-1.407)	(-0.549)
Panel B: Regression Analysis			
CONSTANT	0.639	0.284	0.090
	(9.045)***	(1.196)	(2.422)**
HOT	0.085	0.319	0.005
	(2.153)**	(1.939)*	(0.259)
M/B_t	0.058	0.025	-0.002
	(4.108)***	(0.563)	(-0.368)
$EBITDA_{t-1}$	-0.439	-2.627	0.042
	(-3.141)***	(-3.047)***	(0.554)
$SIZE_{t-1}$	-0.077	-0.144	0.045
	(-4.058)***	(-1.544)	(3.168)***
PPE_{t-1}	-0.257	-1.047	-0.033
	(-2.767)***	(-2.123)**	(-0.477)
$(D/A)_{t-1}$	-0.439	1.149	-0.171
	(-5.749)***	(1.958)*	(-3.026)***
Consumer Staples Ind. Dummy	-0.011	0.644	0.029
	(-0.104)	(1.548)	(0.313)
Energy Ind. Dummy	-0.014	1.571	-0.002
	(-0.172)	(2.060)**	(-0.058)
Health Ind. Dummy	-0.010	0.108	-0.029
	(-0.140)	(0.668)	(-0.927)
Industrials Ind. Dummy	-0.047	0.105	0.086
	(-0.715)	(0.642)	(2.064)**
Information Tech. Ind. Dummy	-0.039	0.205	-0.005
	(-0.470)	(0.986)	(-0.144)
Materials Ind. Dummy	-0.055	0.495	-0.016
	(-0.893)	(2.290)**	(-0.494)
Telecommunications Ind. Dummy	0.002	0.261	0.061
	(0.016)	(1.321)	(1.350)
Utilities Ind. Dummy	0.135	0.203	0.097
	(0.818)	(0.461)	(1.121)
Adj R^2	0.340	0.121	0.080
R^2	0.365	0.155	0.114
N	373	367	373

*,**,*** denotes signficance at 10%, 5% & 1% respectively
[a] denotes Equal variances not assumed (Hot-Cold)
[b] Non-Parametric Test (Mann-Whitney Test) : 2-independent Sample Tests.

From the first column of Panel A in Table 4.4, the proceeds from the sale of total shares are on average 52.49% of IPO year-end total assets for "cold" market firms. The ratio for "hot" market firms is 65.26% - an increase of 24.33% relative to "cold" market firms. The difference is statistically significant (*t*-value = 2.668). This result indicates that "hot" market firms sell substantially more equity than "cold" market firms do. This is consistent with companies exploiting a window of opportunity where they will issue more equity in periods perceived to be favourable than in periods perceived to be unfavourable.

Simply comparing means however, may not be adequate if any difference is being driven by other factors. The "hot" market effect on the amount of equity issued can potentially be due to differing characteristics of "hot" versus "cold" market firms. Hence, a regression (Equation 3.1 in Chapter 3 page 68) is run for the proceeds from the sale of total shares (scaled by total assets at year end of IPO year) over a list of variables to control for various determinants of equity issues.

The *HOT* dummy takes the figure of 1 if the IPO firms issue IPOs during the "hot" market and 0 otherwise. If the variable *HOT* remains significant, then the conclusions on the basis of the comparison of means will be more soundly based. The control variables include the market-to-book ratio (M/B), profitability (EBITDA/A), firm size (SIZE), asset tangibility (PPE/A), and lagged book leverage (D/A). The market-to-book ratio (M/B) of assets is a measure of market performance, while profitability is measured by earnings before interest, tax, depreciation and amortisation (EBITDA) in the pre-issue year. Firm size (SIZE) controls any size-effect associated with the dependent variable

effect while asset tangibility (PPE) controls for any bias towards debts when the firms have a high value of fixed assets. Industry dummies are also included to control for industry effect. As discussed in Chapter 3, all sample firms are categorised into GICS code based on their initial classification at IPO. The GICS are consumer discretionary, consumer staples, energy, health care, industrials, information technology, materials, telecommunication services and utilities. Financial firms are excluded from the analysis.

The first column in Panel B of Table 4.4 confirms the tendency of "hot" market firms to time equity issues. Although various firm characteristics are significant determinants of equity issue activity, the *HOT* variable remains statistically significant after controlling for these firm characteristics. When scaled by total asset at year end, the variable, *proceeds at IPO*, is positively related to the *HOT* variable at 0.085. The p-value of 0.085 is derived using a two-tailed test of statistical significance. Given that the hypothesis suggests that the coefficient of *HOT* should be positive, it may be appropriate to use a one-tailed test of statistical significant; if so, *HOT* variable is statistically significance at the 5% level. In conducting the analysis in this dissertation, two-tailed tests are reported. Such an approach facilitates consideration as to whether any difference from the null is significantly positive or negative but imposes a stricter test than that which might be suggested by the hypotheses. To allow for this, the tables in this dissertation also report if statistics are significant at the 10% level.

In Column 2 of Table 4.4, when the total proceeds are scaled by total asset at the beginning of the year, the independent *HOT* variable coefficient of 0.319 is still statistically significant, albeit at the 10% level.

In Column 3 of Table 4.4, Equation 3.1 is re-run, replacing the dependent variable by net debt issue against the same set of independent variables as described in Equation 3.1. Interestingly, while the Australian data supports the market timing hypothesis, it also suggests that Australian companies increase their book debt in their IPO year. In particular, results from Panel A show that the average net debt issue for the "hot" market firms is 10.34% and 9.67% for the "cold" market firm. However, the debt issues cannot be attributed to the "hot" market effect. The difference of the net debt issued between the "hot" market and "cold" market is not statistically significant as shown in Panel A and the coefficient of the *HOT* dummy is also insignificant as shown in Panel B.

[4.3.2] Comparison Of "Hot" And "Cold" Market Firms

While the preceding section found evidence which supports the market-timing hypothesis, there may be two other reasons which could explain why the "hot" market firms issue more equity than their "cold" market firms, other than the window of opportunity reasoning: (1) over-leveraged hypothesis and (2) growth opportunities hypothesis. To test both these hypotheses, a series of regressions (see Equation 3.2 in Chapter 3, page 70) are conducted.

The dependent variable (Y_t) changes while the independent variables are held constant. In keeping with the approach adopted in other analyses to be presented in this chapter, this allows the dissertation to use variables with different interpretations and predictions in a variety of settings. As this dissertation noted, such an approach facilitates

consideration of competing explanations. The dissertation will use Y_t to model a number of variables: pre-IPO book leverage and the investment rates for the years IPO, IPO+1 and IPO+2. Table 4.5 presents comparisons between the "hot" and "cold" market firms.

Column 1 of Panel A shows that the "hot" and "cold" market firms have very similar leverage prior to their IPO. The average leverage of the "hot" and "cold" market firms are 25.61% and 27.81% respectively and the difference is not statistically different. After adjusting for firm characteristics in Panel B, the coefficient of the *HOT* market dummy remains insignificant, indicating that there is no evidence to suggest that "hot" market firms deviate from their leverage compared to that of the "cold" market firms at pre-IPO. If firms exploiting "hot" market conditions were doing so to reduce their leverage, this coefficient would be expected to be statistically significant, therefore this result rejects the over-leverage explanation.

Columns 2 to 4 of Table 4.5 also suggest that the growth hypothesis cannot explain why "hot" market firms issue more equity. If firms issuing equity were doing so to make further investments, we would expect that "hot" market firms invest more at the IPO year and beyond. In Panel A however, none of the differences between the "hot" and "cold" market firms is statistically significant. Furthermore, after adjusting for firm characteristics in Panel B, the coefficient of the *HOT* dummy remains insignificant.

Table 4.5
Comparison of "Hot" and "Cold" Market Firms

For each variable Y_t, Panel A reports the mean value (in percentage) among hot and cold market firms, and the t-value of their difference.

Panel B reports the coefficients of OLS regressions of which take the form of

$$Y_t = C_0 + C_1HOT + C_2M/B_{IPO} + C_3M/B_{t-1} + C_4EBITDA_{t-1} + C_5SIZE_{t-1} + C_6PPE_{t-1} + C_{IndDummies}\text{Industry Dummies} + error_t$$

The T-statistics are in brackets and are adjusted for heteroskedasticity (White, 1980).
The dependent variable Y_t is the pre-IPO book leverage, the investment rates for years IPO, IPO+1 and IPO+2, and profitability for years IPO, IPO+1 and IPO+2, and IPO+4 in columns one to eight respectively. HOT dummy takes a figure of 1 if the IPO firm was listed on ASX in a hot month, 0 otherwise.The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	$D/A_{PRE-IPO}$	INV/A_t			$EBITDA/A_t$			
t		IPO	IPO+1	IPO+2	IPO	IPO+1	IPO+2	IPO+4
Panel A: Mean Values								
Hot	25.61	2.80	3.94	3.79	-5.32	-9.39	-2.39	1.79
Cold	27.81	3.48	3.84	5.36	-1.82	-5.36	-2.76	2.45
t-value (difference)[a]	(-0.653)	(-0.532)	(0.054)	(-0.778)	(-1.341)	(-1.243)	(0.110)	(-0.134)
z-value (difference)[b]	(-0.938)	(-0.260)	(-0.272)	(-1.125)	(-1.508)	(-1.295)	(-0.439)	(-0.029)
Panel B: Regression Analysis								
CONSTANT	0.253	0.040	0.041	0.102	0.002	-0.066	-0.035	0.021
	(5.493)***	(1.954)*	(1.407)	(1.906)*	(0.048)	(-1.509)	(-0.924)	(0.300)
HOT	-0.015	-0.007	-0.004	-0.025	-0.038	-0.061	0.008	-0.020
	(-0.529)	(-0.508)	(-0.229)	(-1.040)	(-1.885)*	(-3.010)***	(0.356)	(0.576)
M/B_{IPO}	-	-0.002	0.006	-0.004	-0.009	0.009	0.016	-0.001
	-	(-0.770)	(0.949)	(-0.296)	(1.066)	(1.047)	(1.262)	(-0.089)
M/B_{t-1}	-	-	-	-0.006	-	-	-0.010	-0.004
	-	-	-	(-0.734)	-	-	(-0.724)	(-0.282)
$EBITDA_{t-1}$	0.042	0.043	-0.011	0.014	0.630	0.685	0.550	0.781
	(0.443)	(2.062)**	(-0.293)	(0.244)	(6.983)***	(5.744)***	(5.752)***	(5.323)***
$SIZE_{t-1}$	0.117	-0.008	-0.014	-0.021	0.042	0.032	0.038	0.009
	(6.129)***	(-1.094)	(-1.749)*	(-1.643)	(3.568)***	(2.112)**	(2.573)**	(0.372)
PPE_{t-1}	0.395	-0.073	-0.064	-0.044	0.202	0.174	0.053	0.052
	(5.742)***	(-2.633)***	(-1.275)	(-0.661)	(5.175)***	(3.651)***	(1.289)	(0.786)
Consumer Staples Ind. Dummy	0.049	0.006	-0.011	-0.027	-0.046	-0.031	0.036	-0.003
	(0.560)	(0.533)	(-0.860)	(-1.151)	(-1.023)	(-0.732)	(0.830)	(-0.045)
Energy Ind. Dummy	-0.079	-0.011	-0.025	0.012	-0.085	0.015	-0.024	0.052
	(-1.398)	(-0.963)	(-1.524)	(0.216)	(-1.833)*	(0.292)	(-0.728)	(0.589)
Health Ind. Dummy	-0.075	0.005	0.029	-0.012	-0.073	-0.082	-0.042	-0.058
	(-1.573)	(0.255)	(0.888)	(-0.478)	(-1.946)*	(-1.659)*	(-0.904)	(-1.091)
Industrials Ind. Dummy	-0.008	0.052	0.039	0.018	-0.034	0.002	-0.045	0.017
	(-0.139)	(1.777)*	(1.193)	(0.458)	(-0.803)	(0.050)	(-1.264)	(0.364)
Information Tech. Ind. Dummy	-0.093	0.003	0.014	0.034	-0.012	-0.024	-0.013	0.020
	(-2.090)**	(0.177)	(0.481)	(0.840)	(-0.276)	(-0.496)	(-0.265)	(0.326)
Materials Ind. Dummy	-0.152	-0.002	-0.027	-0.030	-0.076	-0.024	-0.038	-0.022
	(-3.555)***	(-0.145)	(-2.143)**	(-0.961)	(-2.029)**	(-0.585)	(-0.964)	(-0.414)
Telecommunications Ind. Dummy	-0.118	0.037	0.006	-0.026	-0.063	-0.097	0.026	-0.003
	(-1.974)**	(1.132)	(0.291)	(-1.224)	(-1.257)	(-1.681)*	(0.521)	(-0.055)
Utilities Ind. Dummy	0.046	0.161	0.208	0.116	-0.085	0.009	0.030	0.063
	(0.452)	(1.556)	(1.531)	(0.969)	(-1.259)	(0.181)	(0.644)	(-0.880)
Adj R^2	0.343	0.046	0.063	0.007	0.394	0.500	0.448	0.484
R^2	0.362	0.079	0.105	0.079	0.415	0.523	0.488	0.539
N	413	373	289	194	373	289	194	133

*, **, *** denotes signficance at 10%, 5% & 1% respectively
[a] denotes Equal variances not assumed (Hot-Cold)
[b] Non-Parametric Test (Mann-Whitney Test) : 2-independent Sample Tests.

Since the results from Columns 1 to 4 reject the over-leverage and growth opportunities explanations, the regression for Equation 3.2 is re-run, replacing the dependent variable by the profitability measure for the years IPO, IPO+1, IPO+2 and IPO+4, over the independent variables to further test the market timing hypothesis. Columns 5 to 8 in Table 4.5 report the profitability of "hot" versus "cold" market firms at the time they go public and in the subsequent year. Consistent with Table 4.3, Panel A of Table 4.5 shows that, on average, the IPO firms are not profitable although there is no evidence to suggest that the "hot" market firms are less profitable than their "cold" market counterparts. After adjusting for the firms' characteristics and industry dummies in Panel B, a significant negative correlation is found between profitability and the *HOT* dummy at IPO and IPO+1 years. This dissertation finds coefficients of -0.038 and -0.061 for IPO and IPO+1 year respectively (significant at 1% and 10% level respectively). This evidence appears to justify the window of opportunity hypothesis whereby favourable market conditions may trigger IPOs of less profitable firms if these firms find it difficult to go public when the IPO market is less active.

[4.3.3] Short-Term Impact Of Market Timing

There is evidence thus far, supporting traces of opportunistic behaviour by Australian firms. If such behaviour is consistently practiced by managers when deciding on their capital structure, then the impact of market timing on the capital structure, in particular leverage, in the IPO year is likely to be negative. Firms will issue less debt and more equity for external funds to take advantage of favourable market condition (to issue equity). To determine the impact of market timing, a regression analysis is conducted to

see if such a negative relationship is present using Equation 3.3 in Chapter 3 page 72. The dependent variables (Y_t) are the book leverage and the change in book leverage at IPO. Table 4.6 presents the short term impact of market timing on the capital structure of the sample firms.

Column 1 of Table 4.6 presents the leverage at IPO year, $(D/A)_t$. Panel A shows that the "hot" market firms have a mean leverage of 25.28% at IPO year compared to the 29.68% of the "cold" market firms. The difference between the two firms however, is not statistically significant. After controlling for the firms' characteristics and industry dummies, the coefficients of the "hot" market effect and the market-to-book variable in Panel B are not statistically significant. This is not consistent with the market timing hypothesis. The second column of Table 4.6 reports the change in book leverage between the "hot" and "cold" market firms. Panel A shows that the mean change in book leverage of the "hot" market firms is 0.75% compared to the -1.27% of the "cold" market firms. While the difference is not statistically significant, it is interesting to find IPO firms raising debt in their IPO year. This implies that while IPO firms issue equity, they also take the opportunity of their "*listed*" status to raise debt in the same IPO year. Such a finding supports the contention presented in the previous section that listing is not a function of being over-leveraged prior to IPO. However, after controlling for the firms' characteristics and industry dummies, there is also no evidence in Panel B to suggest the presence of the market timing hypothesis. The correlation between the change in book leverage in the IPO year and the *HOT* dummy/market-to-book variable is not statistically significant and there is no evidence of market timing hypothesis on capital structure.

Table 4.6
Short-Term Impact of Market Timing on Capital Structure

For each variable Y_t, Panel A reports the mean value (in percentage) among hot and cold market firms, and the t-value of their difference. The time subscript *t* denotes the IPO year.
Panel B reports the coefficients of OLS regressions of which take the form of

$$Y_t = C_0 + C_1HOT + C_2M/B_t + C_3EBITDA_{t-1} + C_4SIZE_{t-1} + C_5PPE_{t-1} + C_6(D/A)_{t-1} + C_{IndDummies}IndustryDummies + error_t$$

The T-statistics are in brackets and are adjusted for heteroskedasticity (White, 1980).
The dependent variable Y_t is the book leverage at IPO year in column one and the change in book leverage in the second column. HOT dummy takes a figure of 1 if the IPO firm was listed on ASX in a hot month, 0 otherwise.The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	$(D/A)_t$	$(D/A)_t - (D/A)_{t-1}$
Panel A: Mean Values		
Hot	25.28	0.75
Cold	29.68	-1.27
t-value (difference)[a]	(-1.615)	(0.845)
z-value (difference)[b]	(-0.599)	(-1.583)
Panel B: Regression Analysis		
CONSTANT	0.258	0.137
	(6.997)***	(4.515)***
HOT	-0.009	0.002
	(-0.398)	(0.144)
M/B_t	-0.005	-0.002
	(-0.933)	(-0.379)
$EBITDA_{t-1}$	0.138	0.078
	(2.081)**	(1.356)
$SIZE_{t-1}$	0.105	0.060
	(7.278)***	(4.763)***
PPE_{t-1}	0.208	0.042
	(3.409)***	(0.763)
$(D/A)_{t-1}$	-	-0.576
	-	(-10.831)***
Consumer Staples Ind. Dummy	0.002	0.007
	(0.035)	(0.113)
Energy Ind. Dummy	-0.088	-0.055
	(-2.210)**	(-1.612)
Health Ind. Dummy	-0.095	-0.056
	(-2.594)***	(-1.946)*
Industrials Ind. Dummy	0.034	0.037
	(0.874)	(-1.082)
Information Tech. Ind. Dummy	-0.078	-0.031
	(-1.857)*	(-0.854)
Materials Ind. Dummy	-0.122	-0.050
	(-3.612)***	(-1.818)*
Telecommunications Ind. Dummy	-0.008	0.051
	(-0.172)	(1.310)
Utilities Ind. Dummy	0.104	0.102
	(1.179)	(1.766)*
Adj R^2	0.432	0.444
R^2	0.451	0.465
N	373	373

*,**,*** denotes signficance at 10%, 5% & 1% respectively
[a] denotes equal variances not assumed (Hot-Cold)
[b] Non-Parametric Test (Mann-Whitney Test) : 2-independent Sample Tests.

Given that there is no evidence of market timing hypothesis on capital structure of Australian IPOs, there is no need for this dissertation to test the persistency of the market timing impact. Hence, no regression is needed to run Equation 3.4 (Chapter 3, page 73).

The findings in Section 4.3 appear to be mixed with regard to the existence of market timing. The existence of debt issuance during the IPO year may have somewhat lessened the impact of market timing on the capital structure of the Australian firms. This seems to suggest that perhaps Australian companies are using their initial public offering (i.e. listed status) to raise capital concurrently through debt. This may be consistent with Pagano *et al.* (1998) who suggest that IPOs are followed by a lower cost of credit, thus suggesting that going public provides a benefit to enable companies to borrow more cheaply. It could also well be that the floating of the company is simply a way to facilitate raising debt. If this argument is true, then the findings in this section suggest a more interesting version of market timing. The use of the short-lived window of opportunity for raising equity forms part of the long term capital structure strategy involving debt (another possible justification is that these firms make use of a "hot" market to raise equity and debt in the IPO year, so as to maintain their target leverage ratios). Such a strategy may be consistent with the relatively small size of Australian companies and the liquidity offered by the Australian equity market.

[4.4] Determinants Of Firm Leverage And Determinations Of The Form Of Financing

To further explore the opportunistic behaviour of firms, the determinants of firm leverage are investigated to see if other capital structure theories can explain the findings in Section 4.3. In particular, this section concentrates on the findings of the indicators for firm performance (proxied by profitability) and market performance (proxied by market to book ratio) to establish an appropriate explanation for the behaviour found in Section 4.3.

Finding that dual issuers (i.e. companies which issue equity and debt concurrently in the same financial year) are common, this section further categorises the firm-year observations described in Table 4.2 into dual, debt, equity and non issuers. This grouping technique, introduced by Hovakimian *et al*. (2004), enables this dissertation to examine the capital structure of firms in a setting where the various financing theories do not share the same predictions. The method of grouping the firms is discussed in Section 3.3.2.1 in Chapter 3. Specifically, the classification of equity (debt) issuers remains the same regardless of whether or not the net equity (debt) figures are scaled by the pre-issue book value of total assets or year-end book value of total assets. In particular, as discussed in Chapter 3, by comparing dual issuers to debt issuers and separately to equity issuers, it is possible to discriminate predictions between the alternative capital structure hypotheses.

This dissertation begins with 2,010 firm year observations (see Table 4.2). In order to classify the data set into the four groups discussed above and to ensure that all firm-year observations include a market performance indicator (i.e. market-to-book ratio), the pre-IPO year and IPO year observations are excluded. It is noted that a potential bias may occur when using an IPO data set as it has the potential of classifying all observed firms to be equity issuers. However, since this section has excluded the pre-IPO and IPO firm-year observations, such a problem should not exist.

Further exclusion includes those firm-year observations which have missing accounting data (i.e. without the full set of accounting data) from their IPO+1 year to their exit from the database due to the outliers as described in Section 4.2. Consequently, a total of 1,074 firm-year observations are left for testing - 253 debt issuers, 253 equity issuers, 204 dual issuers and 364 non issuers. Table 4.7 illustrates the elimination process.

To directly test whether market performance and profitability affect the leverage ratio, an ordinary least squares regression (Equation 3.5 in Chapter 3 page 78) is first run using post-issue leverage as the dependent variable for all types of issuers. The independent variables include the market-to-book ratio (M/B), profitability (EBITDA/A), firm size (SIZE) and asset tangibility (PPE/A). All the independent variables are in the pre-issue year and are scaled by the year end book value of the total assets. The regression also controls for industry and the "hot" market effect. Table 4.8 reports the determinants of firm leverage for all the various issuers.

Table 4.7
Distribution of The Type of Issuers

Distribution of sample security issues from 1994 to 2006. The sample includes issues for which the net amount issued divided by the book value of assets exceeds 5%. (The main sample were companies that floated between 1993-2005. Samples are splitted into Pre-ipo, IPO, IPO+t etc. Pre-IPO data is deleted due to missing required data to calculate the net debt and net equity. IPO data is deleted due to missing required data to calculate pre-issue market-to-book ratio).

	Firm-year Observations		
	Initial	Eliminated	Balance
No. of firm-year observations for grouping	2010		
Pre-IPO, IPO firm-year observations and outliers eliminated		(936)	
No. of firm-year observations for grouping and testing			1074

YEAR	Debt Issue	Equity Issue	Dual Issue	Non Issue	TOTAL
1994	2	0	0	1	3
1995	8	0	1	2	11
1996	7	1	2	11	21
1997	9	4	3	4	20
1998	8	6	2	7	23
1999	3	15	6	8	32
2000	13	11	11	10	45
2001	40	17	20	31	108
2002	37	29	27	74	167
2003	41	36	36	77	190
2004	32	66	44	66	208
2005	51	65	49	72	237
2006	2	3	3	1	9
TOTAL	253	253	204	364	1074

Table 4.8
Determinants of Firm Leverage

This table reports analyses of the financing behaviour (or security issuance) of Australian firms over the period 1994 to 2006. Post-issue leverage is (pre-issue debt + net debt issued)/(pre-issued assets + net debt issued + net equity issued). Firms are defined as issuing a security when the net amount issued exceeds 5% of total assets. Dual issuers are firms issuing both debt and equity in the same fiscal year. Non issuers are passive firms which do not issue or repurchase securities.

This table reports the coefficients of OLS regressions of which take the form
Post-issue $Leverage_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 HOT + \beta_{IndDummies} IndustryDummies + error_t$

The T-statistics are in brackets and are adjusted for heteroskedasticity (White, 1980). HOT dummy takes a figure of 1 if the IPO firm was listed on ASX in a hot month, 0 otherwise. The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	Dual Issuers	**Non Issuers**	**Debt Issuers**	**Equity Issuers**
Constant	0.309 (5.598)***	0.280 (7.301)***	0.361 (7.013)***	0.261 (4.419)***
$Market\text{-}to\text{-}book_{pre\text{-}issue}$	-0.014 (-1.426)	-0.005 (-0.570)	-0.022 (-2.621)***	-0.004 (-0.359)
$EBITDA_{pre\text{-}issue}$	0.196 (2.499)**	0.174 (2.917)***	0.228 (3.176)***	0.206 (2.872)***
$Size_{pre\text{-}issue}$	0.062 (2.706)***	0.082 (6.798)***	0.061 (4.628)***	0.094 (3.737)***
$PPE_{pre\text{-}issue}$	0.321 (4.296)***	0.328 (5.534)***	0.232 (2.984)***	0.289 (4.268)***
HOT	-0.025 (-0.863)	-0.085 (-3.184)***	-0.035 (-1.126)	0.008 (0.290)
Consumer Staples Ind. Dummy	-0.004 (-0.070)	0.102 (1.326)	0.007 (0.127)	0.050 (0.891)
Energy Ind. Dummy	0.013 (0.170)	0.049 (1.311)	0.064 (0.889)	-0.003 (-0.052)
Health Ind. Dummy	0.002 (0.037)	-0.011 (-0.290)	-0.008 (-0.229)	0.037 (0.661)
Industrials Ind. Dummy	0.081 (1.248)	0.049 (1.389)	0.040 (1.086)	0.080 (1.219)
Information Tech. Ind. Dummy	0.009 (0.154)	0.005 (0.163)	0.019 (0.421)	0.042 (0.597)
Materials Ind. Dummy	-0.109 (-2.541)**	-0.035 (-1.0440)	-0.027 (-0.564)	-0.116 (-2.454)**
Telecommunications Ind. Dummy	0.014 (0.257)	0.035 (0.738)	-0.024 (-0.514)	-0.029 (-0.439)
Utilities Ind. Dummy	0.011 (0.123)	0.166 (2.248)**	-0.006 (-0.135)	0.004 (0.035)
Adj R^2	0.371	0.435	0.283	0.377
R^2	0.412	0.455	0.320	0.409
N	204	364	253	253
F-statistics	10.229***	22.484***	8.651***	12.714***

*,**,*** denotes signficance at 10%, 5% & 1% respectively

The pecking order theory predicts that the effect of profitability ($EBITDA_{pre\text{-}issue}$) in the regressions reported in Table 4.8 will be negative if a pecking order is followed. Firms prefer financing through retained earnings, then move to debt and, as a last resort, issue new equity. Therefore, firms with higher past profitability and hence more opportunities to retain earnings, should have lower debt. This negative relationship should also hold for dual issuers which follow the pecking order behaviour. The reason for this is that as dual issuers are able to obtain both types of security when choosing amounts of new debt and equity, they have no incentive to offset the accumulated deviation from the target so that their debt ratio is close to the target. It is observed, however, that the profitability indicators for all the issuers are positive correlations - 0.196, 0174, 0.228 and 0.206 for dual, non, debt and equity issuers respectively (all are statistically significant at the 5% and 1% level respectively). Being more profitable, yet increasing leverage, is not consistent with the pecking order behaviour. The positive association between profitability and leverage for non issuers is consistent with more profitable firms being able to maintain higher levels of debt and as such, is also inconsistent with the pecking order theory. The pecking order theory suggests that higher profitability should be associated with debt reduction strategies.

Instead, the positive relationship between the profitability and leverage for the dual issuers is suggestive of trade-off theory: firms take advantage of the tax deductibility of the interest payments to offset any taxable profit.

When the market performance indicator, $Market\text{-}to\text{-}book_{pre\text{-}issue}$, is analysed, no issuers, except the debt issuers, have a statistically significant relationship between the leverage

and the market performance indicator. A negative coefficient of -0.022 (statistically significant at the 1% level) for the market-to-book ratio is found for the debt issuers. If firms follow market timing strategies, then they should not raise higher debt when the market seemingly overvalues their shares. Rather, firms are more likely to raise more equity to take advantage of the favourable market condition.

Since dual issuers issue both debt and equity, factors which prevent a firm from issuing equity, such as undervaluation, are less likely to have a significant impact on post-issue leverage ratios. Hence, the statistically insignificant relationship between post leverage and the market performance indicator is expected. The result for the equity issuers however, is inconsistent with the market timing hypothesis.

The negative relationship between leverage and market performance for the debt issuers might also be consistent with the hypothesis that, if firms are faced with high growth opportunities, they will tend to have low target debt ratios (see Myers, 1977; Smith and Watts, 1992; and Barclay, Smith, and Watts, 1995). If this is true, the negative relationship is likely to be consistent with the existence of high growth opportunities for the debt issuers. To test whether or not the high growth opportunities hypothesis can explain the negative relationship between leverage and the market performance, an OLS regression of the following equation is run:

$$INV^*_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA/A_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE/A_{t-1} \qquad \textit{Equation 4.1}$$

$$+ \beta_5 HOT + \beta_{IndDummies}\, Industry\ Dummies + \varepsilon_t$$

The dependent variable, INV^*_t, is the debt issuers' investment opportunities and the independent variables remain the same as the other equations discussed in Chapter 3. If the debt issuers really have low target debt ratios due to high growth opportunities, the relationship between the investment opportunities and the pre-issue market to book ratio should be positive and statistically significant. However, the analysis of Table 4.9 reports that there is no evidence to suggest that the debt issuers' investment opportunities are positively related to their pre-issue market to book ratio. This suggests that the negative relationship between leverage and the market performance for the debt issuers is not due to the high growth opportunities explanation.

So far, the findings presented in Section 4.4 have rejected the pecking order theory but provide mixed evidence between trade-off and market timing behaviours. Rather than examining the results of the decisions firms make (that is, the leverage ratio they achieve), the choice of financing is further modelled by running a series of logit regressions where the dependent variable, D_t^*, is a binary observation capturing the choice of financing. This dissertation models the choice between dual issuers (D=1) and equity issuers (D=0) in Column 1 of Table 4.10, debt issuers (D=1) and equity issuers (D =0) in Column 2 and debt issuers (D=1) and dual issuers (D=0) in Column 3. Appendix A summarises firm characteristics and financing decisions for the various issuers.

Running the logit regressions using Equation 3.6 (Chapter 3 page 79), this dissertation is able to test the trade-off theory directly against the market timing hypothesis. Table 4.10 reports the logit regression of the various competing financing choices.

Table 4.9
High Growth Opportunities Hypothesis

This table reports analysis of the investment opportunities of the debt issuers over the period 1994 to 2006. The table reports the coefficients of OLS regression of which takes the form of

$$INV^*_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 HOT + \beta_{IndDummies} IndustryDummies + error_t$$

The T-statistics are in brackets and are adjusted for heteroskedasticity (White, 1980). INV* denotes the investment opportunities of the debt issuers and is proxied by current and non current investments divided by total assets. HOT dummy takes a figure of 1 if the IPO firm was listed on ASX in a hot month, 0 otherwise. The definitions for the independent variables are defined in Table 3.3 of Chapter 3.

	Debt Issuers INV*
Constant	0.140 (2.851)***
Market-to-book$_{pre\text{-}issue}$	0.001 (0.080)
EBITDA$_{pre\text{-}issue}$	-0.074 (-0.911)
Size$_{pre\text{-}issue}$	-0.030 (-2.554)**
PPE$_{pre\text{-}issue}$	-0.094 (-2.024)**
HOT	-0.024 (-1.050)
Consumer Staples Ind. Dummy	-0.024 (-1.253)
Energy Ind. Dummy	-0.054 (-1.786)*
Health Ind. Dummy	-0.038 (-1.188)
Industrials Ind. Dummy	0.014 (0.481)
Information Tech. Ind. Dummy	0.009 (0.200)
Materials Ind. Dummy	-0.062 (-2.447)**
Telecommunications Ind. Dummy	-0.054 (-1.866)*
Utilities Ind. Dummy	0.013 (0.625)
Adj R^2	0.074
R^2	0.122
N	253
F-statistics	2.545***

*,**,*** denotes signficance at 10%, 5% & 1% respectively

Table 4.10
Determinants of The Form of Financing

The sample covers security issuance behaviour from 1994 to 2006. This table reports logit regressions. The z-statistics (based on Huber/White corrected standard errors) are in brackets.

Independent variable	Dual Issue vs Equity Issue	Debt Issue vs Equity Issue	Debt Issue vs Dual Issue
CONSTANT	-0.368 (-0.864)	-0.284 (-0.625)	0.418 (0.979)
Market-to-book$_{pre\text{-}issue}$	0.157 (1.921)*	-0.047 (-0.507)	-0.152 (-1.832)*
EBITDA$_{pre\text{-}issue}$	1.611 (2.840)***	4.148 (5.186)***	1.586 (2.545)**
Size$_{pre\text{-}issue}$	0.171 (1.584)	0.282 (1.939)*	0.061 (0.555)
PPE$_{pre\text{-}issue}$	0.238 (0.485)	0.680 (1.275)	0.650 (1.219)
Leverage$_{pre\text{-}issue}$	-0.319 (-0.623)	-0.167 (-0.309)	0.529 (1.020)
HOT	0.238 (1.083)	0.536 (2.161)**	-0.150 (-0.658)
Consumer Staples Ind. Dummy	0.259 (0.531)	-0.528 (-1.035)	-0.899 (-2.117)**
Energy Ind. Dummy	-0.459 (-1.048)	-1.029 (-2.076)**	-0.708 (-1.484)
Health Ind. Dummy	-0.441 (-1.117)	-0.085 (-0.213)	0.034 (0.091)
Industrials Ind. Dummy	-0.218 (-0.468)	0.573 (1.335)	0.256 (0.691)
Information Tech. Ind. Dummy	0.038 (0.083)	0.680 (1.475)	0.311 (0.786)
Materials Ind. Dummy	-0.388 (-1.093)	-1.205 (-3.049)***	-1.125 (-3.141)***
Telecommunications Ind. Dummy	0.051 (0.103)	0.798 (1.354)	-0.041 (-0.092)
Utilities Ind. Dummy	-0.636 (-0.926)	-0.769 (-1.373)	-0.380 (-0.587)
McFadden R-squared	0.059	0.261	0.099
Dep. Variable = 1	204	253	253
Dep. Variable = 0	253	253	204

*,**,*** denotes signficance at 10%, 5% & 1% respectively

The dual versus equity issue logistic regression enables an examination of the effect of market performance on the choice of the form of financing while holding market timing constant. Differences in market performance observed between dual issuers and equity issuers can therefore be attributed to the trade-off hypothesis. In examining the decision to issue *both* equity and debt (dual-issuance), versus the decision to issue equity only, Column 1 reveals that the coefficients for the pre-issue market performance and profitability indicators are both positive - 0.157 (significant at the 10% level) and 1.611 (significant at the 1% level). The predictions under the trade-off theory for the logit regression between dual issuer and equity issuer (dual issuers are less levered than equity issuers) are that:

(1) The higher the market performance indicator, the more likely the issuer will issue only equity as compared to issuing *both* equity and debt because the high value of the firm cannot be collateralized and too much debt increases the expected costs of bankruptcy; and

(2) The higher the profit, the more likely the issuer will issue *both* equity and debt rather than just equity so that the benefit of debt issuance can be taken advantage of.

Therefore, while the positive coefficient for the profitability is consistent with the predictions of trade-off theory, the positive coefficient for the market performance indicator in Table 4.10 is not consistent with trade-off expected predictions. This dissertation argues that the positive coefficient for the market performance may be due to the firm exercising some form of opportunistic behaviour when deciding on their

choice of financing which cannot be explain by any of the pure form theory of capital structure.

When the results for the debt versus dual model in Column 3 are examined, a negative coefficient of -0.152 (significant at the 10% level) and a positive coefficient of 1.586 (significant at the 5% level) for the pre-issue market-to-book variable and pre-issue profitability respectively are found. The predictions under the trade-off theory are that:

(1) The higher the market performance indicator, the more likely that the issuer will issue *both* equity and debt as compared to just issuing debt for the same reason that the high value of the firm cannot be collateralized and too much debt increases expected costs of bankruptcy; and

(2) The higher the profit, the more likely the issuer will issue only debt instead of *both* equity and debt in order to take full advantage of the benefits of the tax deductibility of interest payments.

This is because compared to debt issuers, dual issuers' leverage increases less. Hence, in the binary modelling between debt and dual issuers, it is more likely for an issuer to issue both debt and equity (to reduce expected costs of bankruptcy due to too much debt) when the market performance is high and to issue more debt when the profitability of the firm is high (to take advantage of the opportunity of tax deductibility). Hence, the findings for the debt-versus-dual logit regression are consistent with the trade-off theory.

Trade-off behaviour is also supported when the results for the model of the choice between debt over equity in Column 2 are analysed. The coefficient for the profitability indicator is 4.148 (significant at the 1% level). The more profit an issuer earns, the more likely the issuer will issue debt instead of equity to cash in on tax deductibility.

The negative coefficient for the market performance indicator is not statistically significant. One possible explanation for the insignificance may be due to the interaction between the *HOT* market dummy and the market-to-book ratio. Both variables capture the market timing effect and the *HOT* market dummy may have drawn away the explanatory power of the market-to-book ratio. To make sure that the statistically insignificance of the market performance indicate is not due to the interaction between the *HOT* market dummy and the market-to-book ratio, Equation 3.6 (see Chapter 3 page 79) is re-run for the model of choice between debt over equity, with the *HOT* market dummy removed from the logit regression. The results presented in Table 4.11 are similar to that presented in Table 4.10. In particular, the analysis in Table 4.11 shows that the market-to-book ratio remains statistically insignificant in Column 2. This confirms that market timing cannot fully describe the data.

Table 4.11
Determinants of The Form of Financing (Without the HOT Dummy)

The sample covers security issuance behaviour from 1994 to 2006. This table reports logit regressions. The z-statistics (based on Huber/White corrected standard errors) are in brackets.

Independent variable	Dual Issue vs Equity Issue	Debt Issue vs Equity Issue	Debt Issue vs Dual Issue
CONSTANT	-0.161 (-0.419)	0.145 (0.352)	0.285 (0.762)
Market-to-book$_{pre\text{-}issue}$	0.155 (1.910)*	-0.055 (-0.595)	-0.147 (-1.800)*
EBITDA$_{pre\text{-}issue}$	1.591 (2.836)***	4.055 (5.113)***	1.576 (2.528)**
Size$_{pre\text{-}issue}$	0.175 (1.617)	0.259 (1.790)*	0.062 (0.561)
PPE$_{pre\text{-}issue}$	0.236 (0.476)	0.659 (1.242)	0.646 (1.208)
Leverage$_{pre\text{-}issue}$	-0.331 (-0.646)	-0.158 (-0.296	0.547 (1.049)
HOT	- -	- -	- -
Consumer Staples Ind. Dummy	0.248 (0.507)	-0.551 (-1.088)	-0.880 (-2.078)**
Energy Ind. Dummy	-0.506 (-1.161)	-1.046 (-2.182)**	-0.702 (-1.454)
Health Ind. Dummy	-0.474 (-1.205)	-0.089 (-0.223)	0.041 (0.108)
Industrials Ind. Dummy	-0.296 (-0.642)	0.400 (0.959)	0.295 (0.807)
Information Tech. Ind. Dummy	0.032 (0.070)	0.719 (1.594)	0.285 (0.722)
Materials Ind. Dummy	-0.471 (-1.346)	-1.306 (-3.345)***	-1.090 (-3.095)***
Telecommunications Ind. Dummy	0.027 (0.055)	0.893 (1.529)	-0.048 (-0.109)
Utilities Ind. Dummy	-0.752 (-1.099)	-0.877 (-1.520)	-0.365 (-0.570)
McFadden R-squared	0.057	0.254	0.099
Dep. Variable = 1	204	253	253
Dep. Variable = 0	253	253	204

*,**,*** denotes signficance at 10%, 5% & 1% respectively

Based on all the evidence presented in this section, the pecking order hypothesis is rejected. While there are elements of market timing behaviour, the results show that trade-off behaviour explains the choice of financing. When Australian issuing firms are profitable, they tend to issue debt. When firms are profitable and perform well in the market, they will issue both debt and equity. The reason behind this could be due to Australian firms behaving opportunistically to exploit favourable market conditions to issue equity. Their ultimate strategy however, remains to maintain a target leverage ratio to maximise the benefit of debt. This explains the positive coefficient for the market performance indicator in the dual versus equity model.

[4.5] Conclusion

In deciding the capital structure of a firm, many past studies have suggested that the classical theories of capital structure explain the managers' decisions. However, managers are unlikely to make their decisions in a vacuum or static manner. When deciding on capital structure policy, managers are likely to exploit any favourable factors and minimise the effects of unfavourable influences as described in Sun Zi's "The Art of War" – "*when the ferocious strike of an eagle breaks the body of its prey, it is because of the exact moment and timing of its engagement"*. In Australian stock-broking parlance, during "hot" markets one must 'feed the chooks.'

This chapter finds that "hot" market firms tend to take advantage of the favourable market conditions to issue more equity during their IPO than their "cold" market counterparts. Such behaviour appears consistent with a market timing strategy. However, there is no evidence that market timing has a long-term impact on a firm's capital structure. Instead, Chapter 4 finds that when the Australian issuing firms are

profitable, they tend to issue debt. This is consistent with the trade-off behaviour. When firms are profitable and perform well in the market, they will issue both debt and equity. Such behaviour is opportunistic but behind it is an overarching strategy to reach a target leverage ratio. Managers take advantage of opportunities to raise external funds but they do not let such opportunities tempt them to stray from their long-term target.

Chapter Five
Opportunism and Target Leverage

"…the wise general in his deliberations must consider both favourable and unfavourable factors…" - Sun Zi[1]

[5.1] Introduction

The analysis in Chapter 4 shows that Australian IPOs are opportunistic. Firms take advantage of the window of opportunity when raising external funds but do so with a view to achieving their target leverage ratio.

Given the unusual and distinguishing phenomenon regarding IPO issuance (i.e. "hot" markets and underpricing) as discussed in Section 2.3.3 of Chapter 2, it is debatable that the use of data from IPO firms may only be bias towards finding supports for the market timing hypothesis. As such, Chapter 5[2] extends the data set to include all listed Australian firms between 1993 and 2005 and the race described in Chapter 4 is once again run for the competing theories. Further, Frank and Goyal (2003) argue that most empirical tests have various weaknesses. It is therefore important to examine the predictions of a theory from a number of points of view rather than relying solely on a single test. Hence, in Chapter 5, leverage deficit and financial deficit are added to further test the explanatory power of both the trade-off and pecking theories.

[1] Griffith (1971), page 113.

[2] A refereed conference paper (entitled "Seize The Moment: Opportunism And Target Leverage") adapted from this chapter was presented at the 15th Conference on the Theories and Practices of Securities and Financial Markets held at Kaohsiung, Taiwan in December 2007. Comments from Kwangwoo Park and conference participants are gratefully acknowledged.

Using a sample of listed firms from the ASX between 1993 and 2005, the data is again separated into the four groups: issuers of debt, equity, dual issuers and firms which do not issue debt or equity. The determinants of firm leverage are analysed to see how various theories of capital structure can explain the determinants' relationship with the leverage. A target leverage proxy for each firm-year observation is also constructed to study whether the Australia firms have a long term target capital structure (see Section 3.3.3 of Chapter 3 for a detailed discussion on the construction of the target leverage proxy).

If the uses of debt and/or equity incur costs, then it is natural for firms to choose the type of security that offers the lowest cost during the window in which funds are to be raised or when the external factors present a favourable condition to raise funds by that particular security or securities. Pagano *et al.* (1998) for example, find evidence of newly listed companies enjoying a lower cost of credit after their initial floating. This suggests that going public provides a benefit to enable companies to borrow more cheaply. In this way, if the firms have a leverage target, they will be able to adjust their leverage within their target range by selectively issuing either debt and/or equity. If this is true, it should therefore be expected that firms are opportunistic seekers. They will always shift from debt to equity issuing, vice-versa or issuing both. Hence, there may not be one particular financing theory that can fully describe the financing behaviour of a firm. Instead, given the past empirical findings discussed in Chapter 2, it is plausible to find various financing behaviours depending on the firms' characteristics and the presence of favourable external conditions.

Likewise as in Chapter 4, analysing leverage focuses on the result of a firm's decision making. Therefore, in addition to analysing the results of a firms' decision making, the determinants of the decisions that they made are also analysed by exploring the determinants of the type of financing. This examination allows this dissertation to understand why and when firms choose to use external financing.

The analysis of Australian companies in this chapter demonstrates that firms behave opportunistically when raising funds. Managers seize the moment to exploit firm characteristics that facilitate a particular capital-raising strategy at a particular time. In the long run however, firms appear to have a target debt ratio which is determined by various tradeoffs between the costs and the benefits of debt *versus* equity. Therefore, managers act opportunistically to achieve strategic goals. These findings are consistent with the findings reported in Chapter 4 (where only IPO data is analysed).

[5.2] Data

This chapter employs a sample of listed firms in the ASX between 1993 and 2005 to examine the determinants of capital structure (and the choice of capital raising strategy). The chapter considers a range of competing theories. However, if the market timing hypothesis is to be validly considered, it needs to control for potential bias in the data which increases the likelihood of any findings supporting the presence of market timing. Some of these firms will be IPOs, or recent IPOs at some time during the sample period. As documented in Chapter 4, the IPO proceeds received by the Australian "hot" market firms are higher than those received by the "cold" market firms. As such, timing

attempts are nowhere more apparent than in the IPO market. Therefore, failure to account for such IPO firms may bias the analysis of capital structure decisions towards a support of market timing. Accordingly, IPO firms analysed in this chapter are defined as sample firms first listed on the ASX between 1993 and 2005 and identified by a IPO dummy variable.[3]

Accounting data are obtained from Aspect FinAnalysis and are first collected for all the firms available from the database between 1992 and 2005. Next, the firm-year observations of those IPO firms which were floated between 1993 and 2005 are identified from the "The Float Report" provided by ASX and the floating records maintained by InvestSMART Financial Services Pty Ltd. For the IPO firms, their accounting data are collected from their IPO year onwards as some of these firms are without pre-IPO data. Further, due to the computation of the net equity and net debt, a year of data is lost. Hence, the firm-year observations available for non-IPO firms (from hereafter, this chapter uses the term "non-IPO" to refer to the mature listed firms) and IPO firms begin from 1993 and IPO+1 year onwards respectively. In keeping with Chapter 4, financial firms (this category includes property trust, investment and financial services, banks, finance and real estate firms) are excluded because their capital structures are likely to be significantly different from the capital structures of other firms in our samples. Firms with missing accounting data are also excluded.

[3] This IPO dummy recognises that firms that are listed in 1992 and before are treated as non-IPO firms while firms listed on 1993 and beyond are regarded as an IPO firm throughout the sampling period. In this chapter, the analysis is extended to include non-IPOs in addition to the firms analysed in Chapter 4. Nonetheless, this dissertation acknowledges that this variable definition may be subject to controversy. An alternative definition, suggested by an examiner, may have been to classify firms as IPOs for a fixed number of years after their initial listing. In order to construct such a variable however, a decision would need to be made about how many years after the initial listing might need to be captured by this alternative dummy variable.

Thereafter, the test variables are constructed with the remaining observations. A total of 6,119 firm-year observations (i.e. 1,400 IPO firm-year observations and 4,719 non-IPO firm-year observations) are available for analysing.

Consistent with Chapter 4, firm-year observations which are outliers with regard to various firm characteristics are also dropped if one of two conditions are met:

(1) Firm-year observations where book leverage and earnings before interest, tax, and depreciation and amortisation/Assets (EBITDA/A) exceed 100% in absolute are excluded; and

(2) Firm-year observations where market to book ratio (M/B) exceeds 10 are also excluded.

Table 5.1 summarises the data selection and filtering process for the firm-year observations, leaving a total of 5,082 firm-year observations for testing, of which 1,225 are IPOs and 3,857 are non-IPOs.

Table 5.1 - Breakdown Of The Total Sample Firm-Year Observations

	Samples		
	Initial	**Eliminated**	**Balance**
No. of firm years observations (1993 – 2005)	**6119**		
No. of firm-year observations eliminated due to firm-characteristics deemed as outliers:			
o Book Leverage and EBITDA/A exceeds 100% in absolute		(983)	
o Market to Book ratio exceeds 10.0		(54)	
No. of firm-year observations available for testing			**5082**

Next, the firm-year observations are put into four groups: issuers of debt, equity, dual issuers (issuing debt and equity concurrently) and fourthly firms which do not issue debt or equity. This dissertation will refer to these groups as dual issuers, debt issuers, equity issuers and non issuers for the rest of this chapter. Table 5.2 illustrates the breakdown of the various issuers' firm-year observations. There are 782 dual issuers, 1,062 debt issuers, 1,303 equity issuers and 1,935 non issuers, giving a total of 5,082 firm-year observations.

Table 5.2 - Breakdown Of Firm-Year Observations Into Dual, Debt, Equity And Non Issuers

	Dual Issuers	Debt Issuers	Equity Issuers	Non Issuers	TOTAL
TOTAL	**782**	**1062**	**1303**	**1935**	**5082**
IPO	**225**	**243**	**332**	**425**	**1225**
Non-IPO	**557**	**819**	**971**	**1510**	**3857**

The definitions of the variables used in this chapter are presented in Table 3.3, Chapter 3.

[5.3] Analysis

[5.3.1] Summary Statistics

Table 5.3 summarises firm characteristics and financing decisions (Appendix B summarises firm characteristics and financing decisions for the various issuers). While I do not wish to make definitive statements about the research questions on the basis of the summary statistics in Table 5.3, it is interesting that many of these numbers are suggestive of the inferences this thesis will make on the basis of the more substantive analysis this dissertation will present in subsequent sections. An inspection of Table 5.3 reveals firm behaviour that is consistent with firms having target leverage ratios. There is also evidence in support of the market timing hypothesis but contradicting evidence against the pecking order theory.

The average leverage for the sample is 45.42% across all years with the average for non-IPOs (47.81%) higher than their IPO (37.92%) counterparts. How *et al.* (1995) document the mean leverage of Australian IPO firms at their IPO year to be 23%. This dissertation finds a higher percentage because the mean is calculated across all years (including observation beyond IPO year). The fact that the leverage is found to be higher for non-IPO firms than IPO firms (the t-value is statistically significant at -11.314 for the independent samples t-test for equality of mean for the leverage between the IPO and Non-IPO firms) is consistent with Pagano *et al.* (1998), who find that companies can achieve a lower cost of debt once they become listed. Therefore, it will take some years before the IPO firms reach the same level of leverage as their counterparts. Non-IPO firms tend to have, on average, negative net debt (mean of -1.74%). The t-value is statistically significant at 2.971 for the independent samples t-test for equality of mean for the net debt between the IPO and Non-IPO firms. Compared to IPO firms (whose average net debt is positive at 2.56%), non-IPO firms' negative net debt can be due to the latter group overshooting their target leverage ratio and the consequential decisions made to move closer to their targets. IPO firms on the other hand, could be trying to increase their leverage closer to their target in the long-run.

Table 5.3
Summary Statistics of Firm Characteristics and Financing Decisions

The table reports the means and the standard deviations of firm year observations of the IPO and non-IPO firms. *Book Leverage (D/A)* is book debt to assets. *Net Debt Issue (d/A)* is defined as the changes in book debt divided by assets. Net Equity Issues (e/A) is defined as the change in book equity minus the change in retained earnings divided by assets. *Newly retained earnings (∆RE/A)* is the change in retained earnings divided by assets. *Market-to-book ratio (M/B)* is defined as book debt plus market value of equity divided by assets. Profitability is measured by (*EBITDA)*, which is earnings before interest, taxes and depreciation divided by assets. Firm size (SIZE) is measured by Operating Revenue divided by assets. *Asset tangibility (PPE)*, is defined as net plant, property and equipment divided by assets. (*INV)* denotes capital expenditure which is proxied by Current and non Current *Investments* to assets ratios. (*DIV)* is ordinary dividends divided by book equity. (*CASH)* is defined as cash and current investments divided by assets. Leverage deficit is the difference between the observed debt ratio and a target debt ratio. Financial deficit is the sum of net equity and net debt.

	N		Book Leverage D/A	Net Debt d/A	Net Equity e/A	Newly Retained Earnings ∆RE/A	Mkt to book ratio M/B	EBITDA	Size	PPE	INV	DIV	Cash	Leverage deficit	Financial deficit
ALL Firms	5082	Mean	45.42%	-0.71%	10.51%	-12.65%	181.93%	-0.57%	73.15%	24.51%	7.36%	5.15%	17.55%	0.0000020%	9.80%
		std	*0.27*	*0.44*	*0.85*	*0.95*	*1.70*	*2.00*	*0.99*	*0.24*	*0.17*	*0.19*	*0.22*	*0.15*	*0.95*
IPO Firms	1225	Mean	37.92%	2.56%	13.36%	-19.42%	191.02%	-6.69%	70.24%	22.71%	5.42%	5.41%	21.88%	0.0000097%	15.91%
		Std	*0.26*	*0.27*	*0.58*	*0.73*	*2.10*	*0.48*	*0.90*	*0.25*	*0.15*	*0.29*	*0.24*	0.15	0.65
Non-IPO Firms	3857	Mean	47.81%	-1.74%	9.60%	-10.50%	179.05%	1.37%	74.07%	25.09%	7.98%	5.06%	16.17%	-0.0000004%	7.86%
		Std	*0.27*	*0.48*	*0.92*	*1.01*	*1.56*	*2.28*	*1.02*	*0.24*	*0.17*	*0.14*	*0.21*	*0.15*	*1.03*

IPO firms also tend to have a higher market-to-book ratio and net equity than non-IPO firms. The t-value is significant at 2.143 for the independent samples t-test for equality of the mean for the market-to-book ratio between the IPO and Non-IPO firms but not significant for the net equity. However, a Mann-Whitney 2-independent samples test shows that z-value is significant at -1.818. The average market-to-book ratio and net equity are 1.91 and 13.36% for IPO firms and 1.79 and 9.60% for non-IPO firms. This is consistent with the market timing hypothesis which suggests that firms will take advantage of their high market-to-book ratio to issue more equity.

Table 5.3 also shows that IPO firms are less profitable compared to the non-IPO firms. The average profitability is -6.69% for IPO firms and 1.37% for non-IPO firms (the z-value from the Mann-Whitney 2-independent samples test is significant at -1.818). This is also consistent with US findings - Jain and Kini (1994) and Mikkelson *et al.* (1997) find a significant reduction in profitability around the IPO year for IPO firms.

Less profitable IPO firms seeking equity finance is consistent with the pecking order hypothesis, especially if such firms are in financial distress. However, these firms tend to increase their net debt concurrently. The pecking order theory predicts that firms will choose debt over equity issue if external funds are to be raised. The issuance of both debt and equity is not consistent with the central predictions of the pecking order theory.

The finding of non-IPO firms being profitable and raising less debt, on average, is consistent with the pecking order hypothesis. However, the fact that non-IPO firms continue to issue equity (average net equity of 9.60%) is not consistent with the pecking

order theory. Even if firms resort to external funding, they should choose to raise debt before raising equity if the pecking order theory describes their behaviour.

[5.3.2] Determinants Of Firm Leverage

As discussed in Chapter 3, the effect between leverages and profitability/ market-to book ratio can be used to investigate if the effects of operating and market performance on the firms' financing decisions are due to trade-off, pecking order financing behaviour or market timing. Hence, to directly test whether market performance and profitability affect the leverage ratio, an ordinary least squares regression (using Equation 3.7 in Chapter 3 page 80) is run with the post-issue leverage as the dependent variable for all the types of issuers.

As discussed in Chapter 3, the pre-issue year market-to-book ratio (M/B) of assets is a measure of market performance, while past profitability is measured by earnings before interest, tax, depreciation and amortisation (EBITDA) in the pre-issue year. Firm size (SIZE) controls any size-effect associated with the dependent variable effect while asset tangibility (PPE) controls for any bias towards debts when the firms have a high value of fixed assets. The lagged book leverage is added to the analysis to recognize that the function of current leverage includes a function of previous leverage as well. All the independent variables are in the pre-issue year and are scaled by the year end book value of the total assets. Equation 3.7 also controls for industry and IPO firms effect. As discussed in Chapter 3, all the sample firms are categorised into their GICS code: consumer discretionary, consumer staples, energy, health care, industrials, information technology, materials, telecommunication services and utilities. Financial firms are

excluded in the analysis. The IPO dummy takes the value of 1 if a firm-year observation is for a firm floated between 1993 and 2005 and 0 otherwise. As mentioned in Section 5.1, failure to account for such IPO firms may bias the analysis of capital structure decisions towards support of market timing.

To address the possible existence of a target capital structure, leverage deficit is calculated for each firm in each year it appears in the data set. The construction of the leverage deficit allows this study to test if firms have a target ratio. The leverage deficit is constructed using a partial adjustment regression. Jalilvand and Harris (1984) and Auerbach (1985) are some of the pioneers who use partial adjustment models (see Greene, 2003 page 568 for the general discussion of the partial adjustment model). There are two stages involved in the partial adjustment regression. The first stage involves estimating the target leverage for each firm-year observation using a Tobit model (see Section 3.3.3 of Chapter 3 for the discussion on the Tobit model), regressing the book leverage on variables which have been found to be important determinants of financing policy (see the discussion of Titman and Wessels, 1988 and Rajan and Zingales, 1995 in Chapter 2 for the discussion on the determinants of financing policies).

From Equation 3.8 in Chapter 3 page 82, the target proxy is obtained to tabulate the leverage deficit. Table 5.4 reports the regression result for Equation 3.8.

Table 5.4
Tobit Regression: Determinants of Financing Policy

This table reports the coefficients of tobit regression of which takes the form of

$$\text{Book Leverage}_t\,(L_t) = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 BookLeverage_{t-1} + \beta_{IPO}\,IPO + \beta_{IndDummies} IndustryDummies + error_t$$

The p-values are in brackets and are adjusted for heteroskedasticity (White, 1980).
IPO dummy takes the figure of 1 if the firm-year observation is of an IPO firm duirng the period of 1993-2005, 0 otherwise. The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

Constant	0.033 (0.0033)***
Market-to-book$_{pre\text{-}issue}$	0.008 (0.0043)***
EBITDA$_{pre\text{-}issue}$	0.041 (0.0292)**
Firm Size$_{pre\text{-}issue}$	0.008 (00137)**
PPE$_{pre\text{-}issue}$	0.075 (0.0000)***
Book Leverage$_{pre\text{-}issue}$	0.854 (0.0000)***
IPO Dummy	-0.012 (0.0608)*
Consumer Staples Ind. Dummy	-0.006 (0.4857)
Energy Ind. Dummy	-0.057 (0.0000)***
Health Ind. Dummy	-0.044 (0.0014)***
Industrials Ind. Dummy	-0.001 (0.9006)
Information Tech. Ind. Dummy	-0.001 (0.9513)
Materials Ind. Dummy	-0.052 (0.0000)***
Telecommunications Ind. Dummy	-0.013 (0.6213)
Utilities Ind. Dummy	-0.026 (0.3924)
Adj R^2	0.682
R^2	0.683
N	5082

*,**,*** denotes signficance at 10%, 5% & 1% respectively

The second stage is to re-estimate the determinants of the leverage using Equation 3.9 in Chapter 3 page 84, which replaces the lagged book leverage in Equation 3.7 with the leverage deficit where the leverage deficit is the observed value of L_t less the predicted value of $\hat{L}_t$ obtained from Equation 3.8. The average leverage deficit of around 0% for the sample firms in Table 5.3 suggests that these firms are close to their target leverage ratios over the sample period.

Table 5.5 reports the determinants of firm leverage (that is, estimates of Equation 3.7 and Equation 3.9 for the classes of issuers defined in Table 5.2). The analyses of the effects associated with profitability and market-to-book in Table 5.5 suggest that pecking order behaviour is not followed by any of the Australian issuers. Trade-off behaviour appears to be present. Additionally, there is an indication that firms raising equity time the market.

The pecking order theory predicts that firms prefer financing through retained earnings, then move to debt and as a last resort issue new equity. Therefore, firms with high past profitability and as a result, opportunities to retain earnings, should have lower debt. The effect of profitability ($EBITDA_{pre\text{-}issue}$) in the regressions reported in Table 5.5 will be negative if the pecking order theory is followed. The analysis of dual issuers demonstrates that increased leverage is associated with increased profitability (the first two columns of Table 5.5 show that the post-dual issue leverage increases with past profitability in regressions (a) and (b): the coefficients – 0.106 and 0.218 respectively are positive and statistically significant). This positive significance of profitability is not consistent with the pecking order theory. If profitable firms follow the pecking order,

they should use greater profitability to reduce their leverage rather than issuing *both* debt and equity. Indeed, issuing *both* debt and equity also seems inconsistent with pecking order theory which ranks strategies.

Table 5.5
Determinants of Firm Leverage

The sample covers corporate financing behaviour from 1993 to 2005. Post-issue leverage is (pre-issue debt + net debt issued)/(pre-issued assets + net debt issued + net equity issued). Firms are defined as issuing a security when the net amount issued exceeds 5% of total assets. Dual issuers are firms issuing both debt and equity in the same fiscal year. Non-issuers are passive firms which do not issue securities.

This table reports the coefficients of OLS regressions of which take the form of

$$\text{Post-issue Leverage}_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 BookLeverage_{t-1} + \beta_{IPO}\, IPO + \beta_{IndDummies} IndustryDummies + error_t \quad (a)$$

$$\text{Post-issue Leverage}_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 LeverageDeficit_{t-1} + \beta_{IPO} IPO + \beta_{IndDummies} IndustryDummies + error_t \quad (b)$$

The p-values are in brackets and are adjusted for heteroskedasticity (White, 1980). The p-value for the null hypothesis that the book leverage coefficients equal one are also presented in square brackets [ ].

Leverage deficit is the difference between the observed debt ratio and the target debt ratio. IPO dummy takes the figure of 1 if the firm-year observation is of an IPO firm duirng the period of 1993-2005, 0 otherwise. The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	Dual Issuers		Non-Issuers		Debt Issuers		Equity Issuers	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Constant	0.226	0.464	0.000	0.381	-0.002	0.424	0.104	0.330
	(0.0000)***	(0.0000)***	(0.9867)	(0.0000)***	(0.9924)	(0.0001)***	(0.0000)***	(0.0000)***
Market-to-book$_{pre\text{-}issue}$	-0.003	0.000	0.010	0.029	-0.032	-0.039	-0.006	-0.004
	(0.4284)	(0.9474)	(0.1004)*	(0.0005)***	(0.4094)	(0.4195)	(0.0009)***	(0.1585)
EBITDA$_{pre\text{-}issue}$	0.106	0.218	0.110	0.330	-1.813	-1.839	0.091	0.180
	(0.0000)***	(0.0000)***	(0.0039)***	(0.0000)***	(0.3156)	(0.3604)	(0.0000)***	(0.0000)***
Firm Size$_{pre\text{-}issue}$	0.007	0.040	0.008	0.032	0.228	0.262	0.034	0.082
	(0.1408)	(0.0011)***	(0.2603)	(0.0874)*	(0.2699)	(0.2306)	(0.000)***	(0.000)***
PPE$_{pre\text{-}issue}$	0.026	0.134	0.065	0.294	0.290	0.464	0.048	0.154
	(0.2158)	(0.0000)***	(0.1595)	(0.0000)***	(0.2198)	(0.0946)*	(0.0089)***	(0.0000)***
Book Leverage$_{pre\text{-}issue}$	0.593	-	0.868	-	0.864	-	0.547	-
p-value coeff.=0	(0.0000)***	-	(0.0000)***	-	(0.0000)***	-	(0.0000)***	-
p-value coeff.=1	*[0.0000]****		*[0.0000]****		*[0.2576]*		*[0.0000]****	
Leverage Deficit$_{pre\text{-}issue}$	-	0.388	-	0.680	-	0.432	-	0.419
p-value coeff.=0	-	(0.0000)***	-	(0.0000)***	-	(0.0227)**	-	(0.0000)***
p-value coeff.=1		*[0.0000]****		*[0.0000]****		*[0.0028]****		*[0.0000]****
IPO Dummy	-0.006	-0.074	-0.003	-0.074	0.216	0.237	-0.009	-0.070
	(0.5699)	(0.0000)***	(0.7975)	(0.0000)***	(0.2913)	(0.3646)	(0.1628)	(0.0000)***
Consumer Staples Ind. Dummy	-0.014	0.002	-0.005	-0.039	0.028	0.039	-0.033	-0.008
	(0.5554)	(0.9530)	(0.5456)	(0.0319)**	(0.5004)	(0.4294)	(0.1485)	(0.7981)
Energy Ind. Dummy	-0.040	-0.074	-0.005	-0.130	0.076	0.029	-0.070	-0.122
	(0.1209)	(0.0240)**	(0.6361)	(0.0000)***	(0.3433)	(0.7514)	(0.0011)***	(0.0000)***
Health Ind. Dummy	-0.012	-0.019	0.000	-0.107	-0.007	-0.065	-0.068	-0.095
	(0.6851)	(0.5825)	(0.9799)	(0.0002)***	(0.9038)	(0.4285)	(0.0020)***	(0.0016)***
Industrials Ind. Dummy	-0.017	-0.002	-0.023	-0.017	-0.056	-0.053	-0.032	-0.026
	(0.4666)	(0.9507)	(0.2718)	(0.5437)	(0.3360)	(0.5013)	(0.1158)	(0.3631)
Information Tech. Ind. Dummy	-0.062	-0.060	-0.075	-0.182	0.693	0.742	-0.079	-0.069
	(0.0264)**	(0.0628)*	(0.0251)**	(0.0000)***	(0.3037)	(0.3236)	(0.0010)***	(0.0441)**
Materials Ind. Dummy	-0.024	-0.077	-0.034	-0.161	0.050	-0.014	-0.080	-0.129
	(0.3059)	(0.0043)***	(0.0498)**	(0.0000)***	(0.3466)	(0.8274)	(0.0001)***	(0.0000)***
Telecommunications Ind. Dummy	-0.058	-0.005	-0.060	-0.140	0.021	0.013	-0.115	-0.089
	(0.1880)	(0.9178)	(0.0179)**	(0.0019)***	(0.8684)	(0.9344)	(0.0061)***	(0.0653)*
Utilities Ind. Dummy	0.015	0.034	-0.041	-0.075	-0.189	-0.269	-0.094	-0.059
	(0.7387)	(0.6113)	(0.1896)	(0.1260)	(0.4179)	(0.3933)	(0.1380)	(0.3986)
Adj R^2	0.640	0.391	0.475	0.259	0.029	0.024	0.742	0.500
R^2	0.647	0.403	0.479	0.265	0.042	0.039	0.744	0.506
N	782	704	1935	1698	1062	921	1303	1201
F-statistics	100.224***	33.203***	126.157***	43.445***	3.281***	2.635***	268.049***	86.816***

*,**,*** denotes signficance at 10%, 5% & 1% respectively

For the equity issuers (in Columns 7 and 8), positive coefficients are obtained for the profitability indicator - 0.091 and 0.180 for regression (a) and (b) respectively (both coefficients are statistically significant at the 1% level). A positive association of profitability and leverage is again not consistent with the predictions of the pecking order theory. If the firm is profitable, it should prefer to use its internal funds if pecking order behaviour is followed.

To further test the theory of pecking order, financial deficits are constructed for each firm-year observation (see Section 3.6 of Chapter 3 for the definition of financial deficit). When this deficit is positive, the firm invests more than it internally generates. When the deficit is negative, the firm generates more cash than it invests and has positive free cash flow. The pecking order theory predicts that firms with higher financial deficits, that is firms which raise more external capital, tend to increase their leverage and this is consistent with the adverse selection theory- a central part in the pecking order theory as argued by Shyam-Sunder and Myers (1999). Hence, financial deficits for the firms are incorporated into Equations 3.7 and 3.9 to form Equations 3.10 and 3.11 in Chapter 3 page 85. Kayhan and Titman (2007) argue that a positive financial deficit and a negative financial deficit may affect debt ratios differently because information issues involved in a share repurchase might not be the same as those involved in a share issuance. Hence, a dummy variable is added to interact with the financial deficit which can control for any asymmetric effect on the debt ratio. This control dummy variable takes a value of 1 when the financial deficit is positive and 0 otherwise.

The results from Table 5.6 are similar to that of Table 5.5. However, the positive correlation between the leverage and the financial deficit, as predicted by the pecking order theory, is not found in all the regressions for all the issuers in Table 5.6. On the contrary, a negative correlation is observed for the dual issuers; -0.008 & -0.010 in Columns 1 and 2 (both coefficients are statistically significant at the 5% level). For these dual issuers, when their internal funds are not sufficient to finance their investment (i.e. the higher their financial deficits), the pecking order theory suggests that they should have increased their issue of leverage. Therefore, this negative correlation is not consistent with the pecking order theory.

While the evidence presented in Tables 5.5 & 5.6 is inconsistent with pecking order behaviour, the positive relationship between leverage and profitability for both dual and equity issuers is suggestive of trade-off behaviour, with firms becoming more levered to take advantage of the tax deductibility of debt when their profits are high. However, such relationships can also be suggestive of market timing. In these cases, managers would be exploiting the investors' propensity to take increased profitability as a signal of the firm's growth prospects and time the market to issue equity instead of debt. This is consistent with the findings by Baker & Wurgler (2002) who found that managers time the market to issue equity when, "*investors are rather too enthusiastic about earnings prospects*".

Table 5.6
Determinants of Firm Leverage (With Financial Deficit)

The sample covers corporate financing behaviour from 1993 to 2005. Post-issue leverage is (pre-issue debt + net debt issued)/(pre-issued assets + net debt issued + net equity issued). Firms are defined as issuing a security when the net amount issued exceeds 5% of total assets. Dual issuers are firms issuing both debt and equity in the same fiscal year. Non-issuers are passive firms do not issue securities.

This table reports the coefficients of OLS regressions of which take the form of

$$\text{Post-issue Leverage}_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 BookLeverage_{t-1} + \beta_{IPO}\, IPO + \beta_6 FinancialDeficits_{t-1} + \beta_{FD} FDDummy + \beta_{IndDummies} IndustryDummies + error_t \quad (a)$$

$$\text{Post-issue Leverage}_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 LeverageDeficit_{t-1} + \beta_{IPO}\, IPO + \beta_6 FinancialDeficits_{t-1} + \beta_{FD} FDDummy + \beta_{IndDummies} IndustryDummies + error_t \quad (b)$$

The p-values are in brackets and are adjusted for heteroskedasticity (White, 1980). The p-value for the null hypothesis that the book leverage coefficients equal one are also presented in square brackets [ ].

Leverage deficit is the difference between the observed debt ratio and the target debt ratio. IPO dummy takes the figure of 1 if the firm-year observation is of an IPO firm duirng the period of 1993-2005, 0 otherwise. Financial deficit is the net amount of debt and equity whereas FDDummy takes the figure of 1 for a positive financial deficit and 0 for a negative financial deficit. The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	Dual Issuers		NON-Issuers		Debt Issuers		Equity Issuers	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Constant	0.244 (0.0000)***	0.469 (0.0000)***	0.005 (0.7187)	0.386 (0.0000)***	0.014 (0.9260)	0.471 (0.0000)***	0.086 (0.0002)***	0.338 (0.0000)***
Market-to-book$_{pre\text{-}issue}$	-0.002 (0.5841)	0.001 (0.8440)	0.010 (0.1456)	0.029 (0.0005)***	-0.012 (0.6441)	-0.011 (0.6869)	-0.006 (0.0009)***	-0.004 (0.1962)
EBITDA$_{pre\text{-}issue}$	0.118 (0.0000)***	0.221 (0.0000)***	0.112 (0.0052)***	0.332 (0.0000)***	-2.225 (0.3077)	-1.991 (0.3514)	0.092 (0.0000)***	0.180 (0.0000)***
Firm Size$_{pre\text{-}issue}$	0.003 (0.5105)	0.038 (0.0016)***	0.008 (0.2753)	0.031 (0.0939)*	0.219 (0.2542)	0.244 (0.2145)	0.035 (0.000)***	0.081 (0.000)***
PPE$_{pre\text{-}issue}$	0.023 (0.2894)	0.138 (0.0000)***	0.067 (0.2097)	0.292 (0.0000)***	0.299 (0.2225)	0.468 (0.0929)*	0.051 (0.0073)***	0.155 (0.0000)***
Book Leverage$_{pre\text{-}issue}$	0.588	-	0.865	-	0.983	-	0.548	-
p-value coeff.=0	(0.0000)***	-	(0.0000)***	-	(0.0000)***	-	(0.0000)***	-
p-value coeff.=1	*[0.0000]****		*[0.0067]****		*[0.9438]*		*[0.0000]****	
Leverage Deficit$_{pre\text{-}issue}$	-	0.397	-	0.686	-	0.863	-	0.423
p-value coeff.=0	-	(0.0000)***	-	(0.0000)***	-	(0.0366)**	-	(0.0000)***
p-value coeff.=1		*[0.0000]****		*[0.0000]****		*[0.7399]*		*[0.0000]****
IPO Dummy	-0.004 (0.7093)	-0.072 (0.0000)***	-0.008 (0.5478)	-0.073 (0.0000)***	0.272 (0.2912)	0.223 (0.3642)	-0.005 (0.4559)	-0.070 (0.0000)***
Financial Deficit$_{pre\text{-}issue}$	-0.008 (0.0204)**	-0.010 (0.0429)**	-0.004 (0.4709)	-0.006 (0.4991)	-0.451 (0.3809)	-0.484 (0.3649)	-0.001 (0.1193)	-0.002 (0.2481)
FD Dummy	-0.009 (0.5363)	-0.007 (0.6987)	-0.003 (0.7841)	-0.006 (0.6364)	-0.038 (0.6807)	-0.012 (0.8984)	0.006 (0.5179)	-0.010 (0.4012)
Consumer Staples Ind. Dummy	-0.022 (0.4045)	0.003 (0.9206)	-0.010 (0.2595)	-0.040 (0.0299)**	0.008 (0.8479)	0.025 (0.5646)	-0.027 (0.2719)	-0.008 (0.8016)
Energy Ind. Dummy	-0.044 (0.1142)	-0.073 (0.0250)**	-0.006 (0.5411)	-0.130 (0.0000)***	0.094 (0.3686)	0.036 (0.7097)	-0.054 (0.0149)**	-0.123 (0.0000)***
Health Ind. Dummy	-0.024 (0.4300)	-0.023 (0.5052)	-0.009 (0.4189)	-0.106 (0.0002)***	0.036 (0.7020)	-0.057 (0.4944)	-0.058 (0.0127)**	-0.095 (0.0013)***
Industrials Ind. Dummy	-0.021 (0.3986)	-0.001 (0.9694)	-0.031 (0.1810)	-0.017 (0.5467)	-0.077 (0.2953)	-0.044 (0.5275)	-0.020 (0.3363)	-0.027 (0.3424)
Information Tech. Ind. Dummy	-0.065 (0.0323)**	-0.060 (0.0600)*	-0.078 (0.0391)**	-0.183 (0.0000)***	0.755 (0.2960)	0.707 (0.3177)	-0.065 (0.0106)**	-0.069 (0.0417)**
Materials Ind. Dummy	-0.032 (0.2124)	-0.078 (0.0036)***	-0.040 (0.0417)**	-0.162 (0.0000)***	0.044 (0.4516)	-0.046 (0.4131)	-0.069 (0.0014)***	-0.129 (0.0000)***
Telecommunications Ind. Dummy	-0.058 (0.2331)	-0.014 (0.7810)	-0.063 (0.0270)**	-0.141 (0.0017)***	0.182 (0.3492)	0.120 (0.5336)	-0.105 (0.0131)**	-0.091 (0.0638)*
Utilities Ind. Dummy	0.033 (0.4552)	0.031 (0.6299)	-0.054 (0.1284)	-0.077 (0.1217)	-0.287 (0.3022)	-0.316 (0.2903)	-0.029 (0.5306)	-0.061 (0.3867)
Adj R^2	0.636	0.394	0.428	0.259	0.041	0.036	0.737	0.500
R^2	0.644	0.408	0.433	0.266	0.058	0.052	0.741	0.507
N	704	704	1698	1698	921	921	1201	1201
F-statistics	77.814***	29.555***	80.257***	38.033***	3.475***	3.117***	211.544***	76.063***

*,**,*** denotes signficance at 10%, 5% & 1% respectively

Further analysis of Table 5.5 on the market performance indicator strengthens the possible presence of market timing. For equity issuers, the negative coefficient for the market-to-book ratio (the coefficient in equation (a) is -0.006 and is significant at the 1% level) is indicative of market timing. In this case, firms may issue equity when they believe their stocks are undervalued.

The negative relationship between leverage and market performance can also be consistent with the hypothesis that if firms are faced with high growth opportunities, they will tend to have low target debt ratios (see Myers, 1977; Smith and Watts, 1992; and Barclay, Smith, and Watts, 1995). If this is true, the negative relationship is likely to be consistent with high growth opportunities instead of market timing. To examine whether or not the negative relationship between leverage and market performance for the equity issuers is due to the growth opportunities hypothesis, an OLS regression of the following equation is run:

$$INV^*_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA/A_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE/A_{t-1+} \qquad \textit{Equation 5.1}$$

$$+\beta_{IPO} IPO + \beta_{IndDummies}\, Industry\ Dummies + \varepsilon_t$$

The dependent variable, INV^*_t, is the equity issuers' investment opportunities and the independent variables remain the same as the other equations discussed in Chapter 3. If the equity issuers really have low target debt ratios due to high growth opportunities, the relationship between the investment opportunities and the pre-issue market to book ratio should be positive and statistically significant. However, the analysis of Table 5.7

reports find that the investments by the equity issuers are not related to their pre-issue market performance, hence rejecting the growth opportunities reasoning.

Table 5.7
High Growth Opportunities Hypothesis

This table reports analysis of the investment opportunities of the equity issuers over the period 1993 to 2005. The table reports the coefficients of OLS regression of which takes the form of

$$INV^*_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_{IPO} IPO + \beta_{IndDummies} IndustryDummies + error_t$$

The p-values are in brackets and are adjusted for heteroskedasticity (White, 1980).

INV* denotes the investment opportunities of the equity issuers and is proxied by current and non current investments divided by total assets. IPO dummy takes the figure of 1 if the firm-year observation is of an IPO firm duirng the period of 1993-2005, 0 otherwise. The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	Equity Issuers INV*
Constant	0.128 (0.0000)***
Market-to-book$_{pre\text{-}issue}$	0.002 (0.5949)
EBITDA$_{pre\text{-}issue}$	0.026 (0.2781)
Firm Size$_{pre\text{-}issue}$	-0.024 (0.0245)**
PPE$_{pre\text{-}issue}$	-0.103 (0.0000)***
IPO Dummy	-0.021 (0.0345)**
Consumer Staples Ind. Dummy	0.002 (0.9462)
Energy Ind. Dummy	-0.035 (0.1050)
Health Ind. Dummy	0.047 (0.0949)*
Industrials Ind. Dummy	0.003 (0.9057)
Information Tech. Ind. Dummy	-0.025 (0.3408)
Materials Ind. Dummy	-0.032 (0.1197)
Telecommunications Ind. Dummy	0.030 (0.3468)
Utilities Ind. Dummy	0.079 (0.1290)
Adj R^2	0.039
R^2	0.049
N	1303
F-statistics	5.109***

*,**,*** denotes signficance at 10%, 5% & 1% respectively

It should be noted that the coefficient for market-to-book is not significant in Equation (b) (Column 8 of Table 5.5) when the equation is run with the leverage deficit rather than past year leverage. The result may be sensitive to the specification of the model which this dissertation estimates (Table 6.5 in Section 6.3 of Chapter 6, however, presents a negative coefficient that is statistically significant at 10% level).

In Table 5.5, a positive association between profitability and leverage is also found for non issuers (the coefficient values in Columns 3 and 4 are 0.110 and 0.330 respectively and are statistically significant). In this case, profitability is not associated with opportunistic behaviour. Rather, it is consistent with more profitable firms being able to maintain higher levels of debt and, as such, is also inconsistent with the pecking order theory as the theory suggests that higher profitability should be associated with debt reduction strategies.

In contrast to the equity and dual issuers, there is no indication in Table 5.5 that debt issuers time the market or follow pecking order in their financing behaviour. The variables for $EBITDA_{pre\text{-}issue}$ and $market\text{-}to\text{-}book_{pre\text{-}issue}$ are not statistically significant in Columns 5 and 6.

Table 5.5 presents clear evidence on target-leverage. If a firm has a target-leverage and if its existing leverage ratio is not within the range of the target, it will adjust its leverage ratio towards the target. For all but firms issuing debt, the coefficient of book leverage is less than one (0.593 for dual issuers, 0.868 for non issuers, and 0.547 for equity issuers) indicating that firms act to reduce leverage. In the case of debt issuers,

the coefficient 0.864 is not significantly different from one (the p-value testing the null hypothesis that this coefficient equals one is 0.2576, suggesting that these debt issue firms are seeking to maintain their leverage at a constant level). The coefficients for leverage deficit are all statistically significant and positive (0.388 for dual issuers, 0.680 for non issuers, 0.432 for debt issuers and 0.419 for equity issuers) and are all less than one (the t-statistic testing the null hypothesis that the coefficients equal one may all be rejected with conventional levels of confidence). Firms over/undershooting their targets will be closer to their targets in the next period. This section however, has focused on the *level* of leverage which is the outcome of the firms' financing decisions. In the following section, the dissertation will model the choice of financing strategy. It is these choices which lead to the outcomes modelled in this section.

[5.3.3] Determinants Of The Form Of Financing

In the preceding section, the pecking order theory does not adequately describe the behaviour of the firms studied. The evidence also suggests some market timing behaviour. In addition, there is strong evidence for the existence of target leverage. This section explores these issues further where this dissertation seeks to model the financing choices made by the firms in the data sample. The results presented in this section suggest that Australian firms pursue a target level of debt. There is evidence that issuers issue debt when they are profitable. When firms are profitable and perform well in the market, they will take the timely opportunity to issue both debt and equity.

Rather than examining the results of the decisions firms make (that is, the leverage ratio they achieve), this section models the choice of financing. A series of logit regressions using Equations 3.12 and 3.13, as described in Chapter 3 page 86, is estimated where the dependent variable (D_t^*) is a binary observation capturing the choice of financing. This section models the choice between dual issuers (D=1) and equity issuers (D=0) in Columns 1 and 2 of Table 5.8, debt issuers (D=1) and equity issuers (D =0) in Columns 3 and 4, and debt issuers (D=1) and dual issuers (D=0) in Columns 5 and 6.

Equation 3.12 is denoted (a) in Table 5.8 and it is reported in Columns 1, 3 and 5. Following the procedure adopted in the previous section, all the regressions are re-run by replacing the lagged book leverage in the pre-issue year with the leverage deficit in the pre-issue years in Equation 3.13 (which is denoted (b) in Table 5.8 and is reported in Columns 2, 4 and 6).

Comparing the decision to issue *both* equity and debt (dual-issuance) and just equity in Columns 1 and 2 (dual issuers (D=1) and equity issuers (D=0)), Table 5.8 finds that the coefficients of book $\text{leverage}_{\text{pre-issue}}$ and $\text{leverage deficit}_{\text{pre-issue}}$ are both negative. The coefficients are -0.879 and -0.866 (both significant at the 1% level) for the book leverage and leverage deficit variables respectively: overshooting the target results in a reduction in leverage through issuing equity. Examining the decision to issue debt rather than equity in Column 4 (debt issuers (D=1) and equity issuers (D =0)), the coefficient of $\text{leverage deficit}_{\text{pre-issue}}$ is also negative and statistically significant: overshooting the target requires a reduction in debt. These findings provide further support to the findings in Section 5.3.2 that Australian firms have target leverage ratios.

Table 5.8
Determinants of The Form of Financing

The sample covers security issuance behaviour from 1993 to 2005. The regression follows a logit form (QML (Huber/White) standard errors & covariance adjusted). The p-values are in brackets.

$$D^*_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 BookLeverage_{t-1} + \beta_{IPO} IPO + \beta_{IndDummies} IndustryDummies + error_t \quad (a)$$

$$D^*_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 LeverageDeficit_{t-1} + \beta_{IPO} IPO + \beta_{IndDummies} IndustryDummies + error_t \quad (b)$$

Independent variable	Dual Issue vs Equity Issue		Debt Issue vs Equity Issue		Debt Issue vs Dual Issue	
	(a)	(b)	(a)	(b)	(a)	(b)
CONSTANT	0.015	-0.376	-0.036	-0.236	-0.1600	0.216
	(0.9584)	(0.1958)	(0.8894)	(0.3695)	(0.5519)	(0.4311)
Market-to-book$_{pre\text{-}issue}$	0.215	0.201	-0.026	-0.018	-0.256	-0.238
	(0.0000)***	(0.0000)***	(0.5504)	(0.7090)	(0.0000)***	(0.0000)***
EBITDA$_{pre\text{-}issue}$	0.560	0.351	3.136	3.165	2.255	2.738
	(0.0102)**	(0.1198)	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Firm Size$_{pre\text{-}issue}$	0.151	0.132	0.430	0.523	0.219	0.271
	(0.0374)**	(0.0729)*	(0.0000)***	(0.0000)***	(0.0357)**	(0.0187)**
PPE$_{pre\text{-}issue}$	0.147	-0.066	1.096	1.055	1.124	1.382
	(0.5634)	(0.7711)	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Book Leverage$_{pre\text{-}issue}$	-0.879	-	-0.138	-	1.097	-
	(0.0000)***	-	(0.5041)	-	(0.0000)***	-
Leverage Deficit $_{pre\text{-}issue}$	-	-0.866	-	-1.203	-	0.228
	-	(0.0008)***	-	(0.0001)***	-	(0.4697)
IPO Dummy	0.006	0.092	-0.064	-0.197	-0.159	-0.405
	(0.9535)	(0.4161)	(0.5834)	(0.1277)	(0.2117)	(0.0036)***
Consumer Staples Ind. Dummy	-0.104	-0.129	0.051	0.154	0.225	0.376
	(0.7229)	(0.6838)	(0.8446)	(0.5812)	(0.3635)	(0.1573)
Energy Ind. Dummy	-0.916	-0.859	-0.907	-0.882	-0.114	-0.144
	(0.0015)***	(0.0050)***	(0.0006)***	(0.0015)***	(0.6785)	(0.6284)
Health Ind. Dummy	-1.224	-1.277	-0.744	-0.802	0.383	0.338
	(0.0001)***	(0.0002)***	(0.0088)***	(0.0091)***	(0.2455)	(0.3532)
Industrials Ind. Dummy	-0.349	-0.402	-0.215	-0.274	0.113	0.159
	(0.2085)	(0.1781)	(0.3840)	(0.2970)	(0.6430)	(0.5438)
Information Tech. Ind. Dummy	-0.349	-0.290	-0.262	-0.228	0.092	0.064
	(0.2379)	(0.3595)	(0.3609)	(0.4592)	(0.7499)	(0.8360)
Materials Ind. Dummy	-0.865	-0.715	-1.067	-0.982	-0.227	-0.297
	(0.0011)***	(0.0117)**	(0.0000)***	(0.0001)***	(0.3328)	(0.2357)
Telecommunications Ind. Dummy	0.189	0.065	-0.571	-0.718	-0.549	-0.569
	(0.6551)	(0.8838)	(0.2480)	(0.1855)	(0.2170)	(0.2360)
Utilities Ind. Dummy	-0.119	-0.097	0.155	0.212	0.042	0.049
	(0.8429)	(0.8817)	(0.7813)	(0.7269)	(0.9525)	(0.9489)
McFadden R-squared	0.043	0.039	0.214	0.232	0.172	0.177
Dep. Variable = 1	782	704	1062	921	1062	921
Dep. Variable = 0	1303	1201	1303	1201	782	704

*,**,*** denotes signficance at 10%, 5% & 1% respectively

In the discussion of Table 5.5 in Section 5.3.2, there is evidence for both trade-off and market timing behaviours. In Table 5.8, this dissertation is able to analyse whether market timing behaviour really exists. Hovakimian *et al.* (2004) argue that if both equity issuers and dual issuers time the market by issuing in periods of high market performance, market timing effects should be insignificant in the dual versus equity issue regressions in Columns 1 and 2 (any differences in market performance observed can be attributed to the trade-off hypothesis). Yet, the analysis on the financing choice between dual versus equity continues to produce statistically significant coefficients of 0.215 and 0.201 in Columns 1 and 2 respectively. This suggests that the higher a firm's pre-issue market-to-book ratios, the more likely it is to be a dual issuer than an equity issuer. This is inconsistent with the expected effects of the market timing and trade-off hypotheses as developed by Hovakimian *et al.* (2004).

Under trade-off theory however, the probability of a firm choosing a more levered form of financing declines with market performance because of increased expected costs of bankruptcy. This is because, while a higher market-to-book ratio means that the value of the firm is increased, a higher ratio cannot be collateralized. Hence, if firms increase their borrowing, they will expose themselves to a higher probability of bankruptcy. The trade-off theory also predict that the probability of a firm choosing a more levered form of financing increases with profitability to take advantage of tax deductibility. According to *Hovakimian et al.* (2004), the predicted signs in the debt versus dual logistic regression (debt issuers (D=1) and dual issuers (D=0)) for the market performance and profitability indicators will be negative *and* positive respectively if trade-off behaviour is followed. This is because dual issuers, almost by definition, are

not as highly levered as debt issuers. Hence, in the binary modelling between debt and dual issuers, it is more likely for an issuer to issue both debt and equity (to reduce probability of bankruptcy due to high leverage level) when the market performance is high and to issue more debt when the profitability of the firm is high to take advantage of the tax deductibility. In Table 5.8, Columns 5 and 6, the pre-issue market-to-book variable has a negative coefficient of -0.256 (significant at the 1% level) when book $\text{leverage}_{\text{pre-issue}}$ is used and -0.238 (also significant at the 1% level) when leverage $\text{deficit}_{\text{pre-issue}}$ is used. Pre-issue EBITDA is positive and statistically significant (positive coefficients of 2.255 and 2.738 are both significant at the 1% level when book $\text{leverage}_{\text{pre-issue}}$ and leverage $\text{deficit}_{\text{pre-issue}}$ are used respectively). This indicates that firms are more likely to issue debt when they are profitable. Such a result concludes that the trade-off theory better explains the observed behaviour than pure market timing.

The trade-off explanation is also consistent with the analysis of the results for the model of the choice between debt over equity (debt issuers (D=1) and equity issuers (D =0)) in Columns 3 and 4. The more profit an issuer earns, the more likely the issuer will issue debt instead of equity. Such a finding is consistent with the trade-off theory - the coefficients for the profitability indicator are 3.136 and 3.165 (significant at the 1% level) when adjusted with pre-issued book leverage and leverage deficit respectively. Furthermore, the negative coefficient for the market performance indicator is not statistically significant, showing that market timing cannot describe the data.

On the basis of the results presented in Table 5.8, trade-off behaviour rather than market timing best explains the choice of financing. Between debt and equity, there is evidence

that profitable Australian firms are more likely to issue debt. If they have a leverage deficit however, they will issue equity. In the long run therefore, Australian firms are issuing equity to balance their leverage ratio so that they are close to their target leverage. However, being opportunistic, firms choose the most favourable condition when issuing equity (that is, when the market views the firms' value highly). Comparing dual issuers to equity and debt issuers, it is apparent that dual issuers issuing securities (of debt and equity) will do so when their market performance is high, when they are profitable and when they are already close to their target ratio. Such behaviour is consistent with evidence of Australian issuers having target leverage ratios as their ultimate goal, and acting opportunistically by using a market timing strategy as a means to reach their ultimate goal of having a leverage ratio close to their target.

[5.4] Conclusion

In "The Art of War", Sun Zi argued that, "*the wise general in his deliberations must consider both favourable and unfavourable factors"*. In business, as in war, the wise manager will formulate strategies that consider both favourable and unfavourable business conditions. If external factors are favourable, managers should exploit them to increase the wealth of their shareholders and, or, their own wealth. If there are unfavourable trends, the managers must act to minimise negative impacts (see Foo and Grinyer, 2000 for a discussion on organising business strategies). Successful exploitation of favourable external factors may assist managers to achieve their business goals (such as obtaining the required financing at the lowest possible cost of financing). Hence, when deciding on capital structure policy, managers should exploit favourable factors and minimise the effects of unfavourable influences – "*carpe diem quam*

*minimum credula postero" – "Seize the day, put no trust in tomorrow" (*Horace, *Odes* 1.11)!

When Australian issuing firms are profitable, they tend to issue debt. When firms are profitable and are performing well in the market, they will issue both debt and equity. While firms seize the opportunities to obtain financing when the conditions for doing so are optimal, they do so in a way which is consistent with having a long-run target capital structure. Therefore, in order to adjust their actual leverage ratio, they raise external funds by taking advantage of the window of opportunity available to help them achieve their target capital structure in a strategic way.

Chapter Six
Robustness Tests

[6.1] Introduction

On the basis of the analysis presented in Chapters 4 and 5, it appears that Australian firms behave opportunistically. When Australian issuing firms are profitable, they tend to issue debt. When firms are profitable and are performing well in the market, they will issue both debt and equity. However, Australian firms have a target leverage ratio with which they will adjust their capital structure accordingly to maintain that target.

In this chapter, two additional robustness checks are made to ensure that the results obtained from Chapters 4 and 5 are robust. Firstly, in Chapter 4, the OLS regression on Equations 3.5 and 3.6 present possible correlations between the firm-year observations within the individual IPO firm. Hence, a repeat dummy is added to both equations and re-run. The result is then compared to that documented in Chapter 4.

Secondly, this dissertation uses firm-level data from Australia. Many firms will appear in the data over a number of years and this is recognised by using an econometric technique appropriate for panel-data. A panel-data set is simply one that includes a sample of observations from firms or individuals, where those observations are taken over a period of time (see Greene, 2003, Chapter 13).[1] Recognising that not all the firms

[1] A seemingly standard textbook example is one where families are sampled over a number of years to examine their patterns of consumption. Failure to recognise that the same family is being observed repeatedly might lead to false inferences being made.

will be present in the data for all years, panel (unbalanced) analyses are conducted for Equations 3.5 to 3.7 and Equations 3.9 to 3.13.

Section 6.2 outlines the test for possible correlations and the results obtained from the additional test, whereas the results obtained from the panel (unbalanced) analysis are discussed in Section 6.3. Finally, Section 6.4 concludes the chapter.

[6.2] Possible Correlations Of Firm-Year Observations

In Section 4.4 of Chapter 4, using Equations 3.5 and 3.6, this dissertation investigates the determinants of firm leverage and the determinants of the form of financing by the various firms. The sample used in Chapter 4 is a set of Australian IPOs floated on the ASX between 1993 and 2005. As discussed in Chapter 3, these sample firms are grouped into the 4 categories of security issuers (i.e. dual, debt, equity and non issuers). From the initial sample size of 2,010 firm year observations from Table 4.2 of Chapter 4, the sample size is reduced to 1,074 as described in Table 4.7 of Chapter 4. Consequently, the sample has 253 debt issuers, 253 equity issuers, 204 dual issuers and 364 non issuers.

Within each issuer category however, a particular sample firm may have multiple issues during the sample period. For example, under the definition of the firms' grouping, Kagara Zinc Ltd (ASX code: KZL) is a dual issuer for the fiscal years of 2001, 2002, 2003 and 2005 and an equity issuer in 2004. Hence when examining the determinants of firm leverage for dual issuers, there a possibility of correlations between the firm-year observations within Kagara Zinc Ltd (KZL) - the accounting data for the fiscal year of

2002 may be correlated to that of year 2001. Therefore, to control for any possibility of correlations, a repeat dummy is added to both equations to form Equations 3.5a and 3.6a as described in Chapter 3 page 87.[2]

In Equation 3.5a, this repeat dummy will take the value of 1 if a particular firm has more than one firm-year observation within the same category of issuer, and zero otherwise. For example, the repeat dummy for KZL will be 1 for its 2001, 2002, 2003 and 2005 observations; 0 for its 2004 equity issue. Likewise for the binary regression on Equation 3.6a, this dummy will also take the value of 1 if a particular firm has more than one firm-year observation within the same category of issuer, and zero otherwise. For example, a logit regression between dual versus equity issues, the repeat dummy for KZL will be 1 for its 2001, 2002, 2003 and 2005 dual issues; 0 for its 2004 equity issue.

Tables 6.1 and 6.2 present the results from the regressions on Equations 3.5a and 3.6a. The analysis shows that, although the repeat dummy is found to be statistically significant in some instances, the results obtained for the rest of the variables remain similar to those obtained from Equation 3.5 and 3.6 (the results are presented in Tables 4.8 and 4.10 in Chapter 4). Hence, the inferences from the latter set of equations are robust.

[2] Another way to control for this possibility of correlations is to remove the firms that have more than one firm-year observation and re-run Equations 3.5 and 3.6. However, when I remove these firms from the sample and re-run Equations 3.5 and 3.6, I lose between 49% to 77% of firm-year observations for the regressions. Such a dramatic fall in the number of observations reduces the power of the tests and makes the drawing of valid inferences problematic. As such, this dissertation did not use this technique. Furthermore, this dissertation also performs a panel (unbalanced) analysis (see Section 6.3). Such panel data technique can also recognise that a same firm maybe observed repeatedly.

Table 6.1
Determinants of Firm Leverage (With Repeat Dummy)

This table reports analyses of the financing behaviour (or security issuance) of Australian firms over the period 1994 to 2006. Post-issue leverage is (pre-issue debt + net debt issued)/(pre-issued assets + net debt issued + net equity issued). Firms are defined as issuing a security when the net amount issued exceeds 5% of total assets. Dual issuers are firms issuing both debt and equity in the same fiscal year. Non issuers are passive firms which do not issue or repurchase securities.

This table reports the coefficients of OLS regressions of which take the form of

$$\text{Post-issue Leverage}_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 HOT + \beta_{IndDummies} IndustryDummies + \beta_{RD} Repeat\ Dummy + error_t$$

The T-statistics are in brackets and are adjusted for heteroskedasticity (White, 1980). HOT dummy takes a figure of 1 if the IPO firm was listed on ASX in a hot month, 0 otherwise. Repeat dummy takes a figure of 1 if the issuer has more than a firm-year observation within the issuer catergory, 0 otherwise.The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	Dual Issuers	**Non Issuers**	**Debt Issuers**	**Equity Issuers**
Constant	0.238 (4.377)***	0.258 (6.075)***	0.304 (5.632)***	0.277 (4.460)***
$\text{Market-to-book}_{\text{pre-issue}}$	-0.011 (-1.012)	-0.002 (-0.261)	-0.019 (-2.230)**	-0.005 (-0.403)
$EBITDA_{\text{pre-issue}}$	0.164 (2.134)**	0.161 (2.638)***	0.193 (2.618)***	0.207 (2.903)***
$Size_{\text{pre-issue}}$	0.056 (2.508)**	0.080 (6.757)***	0.055 (4.325)***	0.091 (3.624)***
$PPE_{\text{pre-issue}}$	0.298 (3.960)***	0.316 (5.313)***	0.206 (2.676)***	0.288 (4.315)***
HOT	-0.018 (-0.621)	-0.089 (-3.345)***	-0.027 (-0.876)	0.010 (0.353)
Consumer Staples Ind. Dummy	-0.020 (-0.388)	0.107 (1.404)	0.022 (0.393)	0.055 (0.939)
Energy Ind. Dummy	0.017 (0.245)	0.053 (1.447)	0.062 (0.859)	0.013 (0.233)
Health Ind. Dummy	0.005 (0.075)	-0.014 (-0.352)	-0.009 (-0.259)	0.045 (0.804)
Industrials Ind. Dummy	0.098 (1.633)	0.043 (1.210)	0.039 (1.099)	0.078 (1.226)
Information Tech. Ind. Dummy	0.002 (0.031)	0.001 (0.038)	0.023 (0.496)	0.044 (0.621)
Materials Ind. Dummy	-0.115 (-2.880)***	-0.030 (-0.888)	-0.019 (-0.417)	-0.106 (-2.193)**
Telecommunications Ind. Dummy	0.017 (0.274)	0.040 (0.836)	-0.034 (-0.733)	-0.023 (-0.347)
Utilities Ind. Dummy	0.024 (0.228)	0.163 (2.240)**	-0.003 (-0.064)	0.000 (0.004)
Repeat Dummy	0.107 (3.560)***	0.036 (1.311)	0.086 (2.807)***	-0.035 '(-1.195)
Adj R^2	0.409	0.437	0.308	0.378
R^2	0.450	0.458	0.346	0.413
N	204	364	253	253
F-statistics	11.055***	21.104***	8.993***	11.940***

*,**,*** denotes signficance at 10%, 5% & 1% respectively

Table 6.2
Determinants of The Form of Financing (With Repeat Dummy)

The sample covers security issuance behaviour from 1994 to 2006. This table reports logit regressions. The z-statistics (based on Huber/White corrected standard errors) are in brackets.

Independent variable	Dual Issue vs Equity Issue	Debt Issue vs Equity Issue	Debt Issue vs Dual Issue
CONSTANT	-0.423 (-0.922)	-0.492 (-1.013)	0.137 (0.301)
Market-to-book$_{pre\text{-}issue}$	0.161 (1.939)*	-0.038 (-0.420)	-0.136 (-1.622)*
EBITDA$_{pre\text{-}issue}$	1.621 (2.838)***	4.140 (5.157)***	1.521 (2.422**
Size$_{pre\text{-}issue}$	0.170 (1.577)	0.271 (1.835)*	0.051 (0.465)
PPE$_{pre\text{-}issue}$	0.231 (0.470)	0.652 (1.211)	0.620 (1.173)
Leverage$_{pre\text{-}issue}$	-0.321 (-0.626)	-0.201 (-0.370)	0.356 (0.674)
HOT	0.240 (1.089)	0.555 (2.229)**	-0.132 (-0.581)
Consumer Staples Ind. Dummy	0.242 (0.496)	-0.547 (-1.053)	-0.932 (-2.193)**
Energy Ind. Dummy	-0.477 (-1.088)	-1.076 (-2.134)**	-0.644 (-1.348)
Health Ind. Dummy	-0.457 (-1.156)	-0.102 (-0.256)	0.034 (0.089)
Industrials Ind. Dummy	-0.214 (-0.459)	0.548 (1.263)	0.276 (0.744)
Information Tech. Ind. Dummy	0.039 (0.087)	0.697 (1.505)	0.349 (0.875)
Materials Ind. Dummy	-0.402 (-1.129)	-1.219 (-3.075)***	-1.116 (-3.134)***
Telecommunications Ind. Dummy	0.045 (0.090)	0.755 (1.298)	-0.056 (-0.126)
Utilities Ind. Dummy	-0.638 (-0.937)	-0.744 (-1.348)	-0.313 (-0.482)
Repeat Dummy	0.081)0.358)	0.272 (0.879)	0.408 (1.537)
McFadden R-squared	0.059	0.262	0.103
Dep. Variable = 1	204	253	253
Dep. Variable = 0	253	253	204

*,**,*** denotes signficance at 10%, 5% & 1% respectively

[6.3] Panel (Unbalanced) Analyses

In treating my data as a cross-section in Chapters 4 and 5, I follow the lead of Alti (2006) and Hovakimian *et al.* (2004) to facilitate comparison with their work. I also analysed the data as a panel; these analyses did not lead to different inferences from those presented in Chapter 4 and 5 in this dissertation.

In Chapters 4 and 5, the samples used for the regression are from panel data. Since this panel data relates to Australian listed firms over time, there is bound to be heterogeneity in these firms. Therefore, the techniques of panel data estimation can take such heterogeneity explicitly into account by allowing for firm-specific variables (see Greene, 2003, Chapter 13). However, there is missing data in our initial sample collected, resulting in some firm observations not having a continuous time series for the regressions. Consequently, the data set regressed using the equations described in Chapters 4 and 5 is an unbalanced panel set. Hence, to control for heterogeneity explicitly and to test if the inferences made in Chapters 4 and 5 are robust, panel (unbalanced) analyses are conducted for Equations 3.5 to 3.7 and Equations 3.9 to 3.13.

Firstly, panel (unbalanced) analyses are conducted for Equations 3.5 and 3.6 and Tables 6.3 and 6.4 report the regression results. The analyses of Tables 6.3 and 6.4 suggest that the results obtained are similar to that reported in Chapter 4. Hence, the inferences made in Chapter 4 are robust.

Table 6.3
Panel (Unbalanced) Analysis: Determinants of Firm Leverage

The sample covers corporate financing behaviour from 1994 to 2006. Post-issue leverage is (pre-issue debt + net debt issued)/(pre-issued assets + net debt issued + net equity issued). Firms are defined as issuing a security when the net amount issued exceeds 5% of total assets. Dual issuers are firms issuing both debt and equity in the same fiscal year. Non issuers are passive firms which do not issue or repurchase securities.

This table reports the coefficients of Panel Least Square regressions of which take the form of

$$\text{Post-issue Leverage}_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 HOT + \beta_{IndDummies} IndustryDummies + error_t$$

The T-statistics are in brackets and are adjusted for heteroskedasticity (White, 1980). HOT dummy takes a figure of 1 if the IPO firm was listed on ASX in a hot month, 0 otherwise.The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	Dual Issuers	**Non Issuers**	**Debt Issuers**	**Equity Issuers**
Constant	0.301 (5.181)***	0.280 (7.609)***	0.382 (7.930)***	0.219 (3.643)***
Market-to-book$_{pre\text{-}issue}$	-0.012 (-1.16)	-0.007 (-0.837)	-0.024 (-2.909)***	0.000 (0.011)
EBITDA$_{pre\text{-}issue}$	0.199 (2.474)**	0.190 (3.169)***	0.266 (3.802)***	0.200 (2.911)***
Size$_{pre\text{-}issue}$	0.065 (2.636)***	0.081 (6.599)***	0.058 (4.409)***	0.083 (3.807)***
PPE$_{pre\text{-}issue}$	0.300 (3.975)***	0.297 (4.960)***	0.165 (2.269)**	0.242 (3.808)***
HOT	-0.009 (-0.263)	-0.068 (-2.606)***	-0.033 (-1.128)	0.024 (0.899)
Consumer Staples Ind. Dummy	-0.002 (-0.038)	0.109 (1.379)	0.028 (0.491)	0.108 (1.725)*
Energy Ind. Dummy	0.022 (0.256)	0.026 (0.769)	0.026 (0.376)	0.056 (0.924)
Health Ind. Dummy	-0.007 (0.112)	-0.002 (-0.052)	0.005 (0.163)	0.079 (1.499)
Industrials Ind. Dummy	0.024 (0.342)	0.041 (1.189)	0.022 (0.621)	0.055 (1.004)
Information Tech. Ind. Dummy	0.008 (0.130)	0.007 (0.221)	0.004 (0.081)	0.096 (1.458)
Materials Ind. Dummy	-0.106 (-2.347)**	-0.052 (-1.480)	-0.035 (-0.700)	-0.073 (-1.450)
Telecommunications Ind. Dummy	0.001 (0.017)	0.047 (0.989)	-0.015 (-0.317)	0.027 (0.411)
Utilities Ind. Dummy	-0.003 (-0.040)	0.166 (2.090)**	0.041 (0.109)	0.022 (0.293)
Adj R^2	0.368	0.458	0.335	0.484
R^2	0.443	0.496	0.401	0.531
N: Panel (unbalanced)	203	364	253	253
F-statistics	5.907***	13.284***	6.069***	11.289***

*,**,*** denotes signficance at 10%, 5% & 1% respectively

Table 6.4
Panel (Unbalanced) Analysis: Determinants of The Form of Financing

The sample covers security issuance behaviour from 1994 to 2006. This table reports logit regressions using panel (unbalanced) data. The z-statistics (Covariance matrix computed using second derivatives) are in brackets.

Independent variable	Dual Issue vs Equity Issue	Debt Issue vs Equity Issue	Debt Issue vs Dual Issue
CONSTANT	-0.349 (-0.823)	-0.284 (-0.621)	0.407 (0.969)
Market-to-book$_{pre\text{-}issue}$	0.146 (1.863)*	-0.047 (-0.512)	-0.146 (-1.727)*
EBITDA$_{pre\text{-}issue}$	1.587 (3.090)***	4.148 (5.684)***	1.589 (2.690)***
Size$_{pre\text{-}issue}$	0.171 (1.463)	0.282 (1.994)**	0.060 (0.617)
PPE$_{pre\text{-}issue}$	0.246 (0.493)	0.680 (1.255)	0.641 (1.192)
Leverage$_{pre\text{-}issue}$	-0.301 (-0.602)	-0.167 (-0.304)	0.519 (0.980)
HOT	0.231 (1.069)	0.536 (2.198)**	-0.146 (-0.633)
Consumer Staples Ind. Dummy	0.251 (0.522)	-0.528 (-1.020)	-0.893 (-2.051)**
Energy Ind. Dummy	-0.508 (-1.163)	-1.029 (-2.108)**	-0.668 (-1.350)
Health Ind. Dummy	-0.438 (-1.126)	-0.085 (-0.215)	0.033 (0.088)
Industrials Ind. Dummy	-0.224 (-0.491)	0.573 (1.381)	0.262 (0.715)
Information Tech. Ind. Dummy	0.041 (0.089)	0.680 (1.474)	0.308 (0.793)
Materials Ind. Dummy	-0.390 (-1.112)	-1.205 (-3.095)***	-1.121 (-3.111)***
Telecommunications Ind. Dummy	0.057 (0.112)	0.798 (1.486)	-0.039 (-0.092)
Utilities Ind. Dummy	-0.638 (-0.906)	-0.769 (-1.129)	-0.373 (-0.523)
McFadden R-squared	0.058	0.261	0.098
Dep. Variable = 1	203	253	253
Dep. Variable = 0	253	253	203

*,**,*** denotes signficance at 10%, 5% & 1% respectively

Secondly, panel (unbalanced) analyses are conducted on Equations 3.7 and 3.9. Table 6.5 presents the analyses on Equation 3.7 and 3.9 and the results are similar to those documented in Chapter 5.

Table 6.5
Panel (Unbalanced) Analysis: Determinants of Firm Leverage

The sample covers corporate financing behaviour from 1993 to 2005. Post-issue leverage is (pre-issue debt + net debt issued)/(pre-issued assets + net debt issued + net equity issued). Firms are defined as issuing a security when the net amount issued exceeds 5% of total assets. Dual issuers are firms issuing both debt and equity in the same fiscal year. Non-issuers are passive firms which do not issue securities.

This table reports the coefficients of Panel Least Square regressions of which take the form of

$$\text{Post-issue Leverage}_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 BookLeverage_{t-1} + \beta_{IPO} IPO + \beta_{IndDummies} IndustryDummies + error_t \quad (a)$$

$$\text{Post-issue Leverage}_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 LeverageDeficit_{t-1} + \beta_{IPO} IPO + \beta_{IndDummies} IndustryDummies + error_t \quad (b)$$

The p-values are in brackets and are adjusted for heteroskedasticity (White, 1980).

Leverage deficit is the difference between the observed debt ratio and the target debt ratio. IPO dummy takes the figure of 1 if the firm-year observation is of an IPO firm duirng the period of 1993-2005, 0 otherwise. The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	Dual Issuers		Non-Issuers		Debt Issuers		Equity Issuers	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Constant	0.242	0.462	0.008	0.382	0.025	0.402	0.101	0.331
	(0.0000)***	(0.0000)***	(0.6009)	(0.0000)***	(0.8605)	(0.0013)***	(0.0000)***	(0.0000)***
Market-to-book$_{pre\text{-}issue}$	-0.005	-0.003	0.009	0.026	-0.041	-0.050	-0.007	-0.005
	(0.1326)	(0.4331)	(0.1499)	(0.0019)***	(0.3728)	(0.3547)	(0.0002)***	(0.0832)*
EBITDA$_{pre\text{-}issue}$	0.096	0.182	0.102	0.317	-1.733	-1.810	0.093	0.160
	(0.0000)***	(0.0000)***	(0.0034)***	(0.0000)***	(0.3137)	(0.3536)	(0.0000)***	(0.0000)***
Firm Size$_{pre\text{-}issue}$	0.010	0.046	0.008	0.033	0.234	0.280	0.038	0.088
	(0.0634)*	(0.0012)***	(0.2479)	(0.0861)*	(0.2693)	(0.2221)	(0.000)***	(0.000)***
PPE$_{pre\text{-}issue}$	0.036	0.148	0.068	0.286	0.301	0.455	0.045	0.149
	(0.0840)*	(0.0000)***	(0.1405)	(0.0000)***	(0.2250)	(0.0909)*	(0.0124)***	(0.0000)***
Book Leverage$_{pre\text{-}issue}$	0.562	-	0.855	-	0.805	-	0.553	-
	(0.0000)***	-	(0.0000)***	-	(0.0000)***	-	(0.0000)***	-
Leverage Deficit$_{pre\text{-}issue}$	-	0.346	-	0.642	-	0.343	-	0.400
	-	(0.0000)***	-	(0.0000)***	-	(0.1297)	-	(0.0000)***
IPO Dummy	0.002	-0.041	0.005	-0.048	0.209	0.272	-0.006	-0.054
	(0.8331)	(0.0047)***	(0.6686)	(0.0047)***	(0.2881)	(0.2885)	(0.3967)	(0.0000)***
Consumer Staples Ind. Dummy	-0.013	-0.005	-0.007	-0.039	0.043	0.059	-0.026	-0.024
	(0.5634)	(0.8370)	(0.4081)	(0.0424)**	(0.4504)	(0.03710)	(0.2690)	(0.4517)
Energy Ind. Dummy	-0.053	-0.093	-0.008	-0.131	0.066	0.041	-0.072	-0.128
	(0.0372)**	(0.0012)***	(0.4099)	(0.0000)***	(0.3873)	(0.6761)	(0.0012)***	(0.0000)***
Health Ind. Dummy	-0.015	-0.019	-0.003	-0.109	-0.005	-0.016	-0.064	-0.090
	(0.5933)	(0.5381)	(0.8105)	(0.0002)***	(0.9419)	(0.8862)	(0.0048)***	(0.0014)***
Industrials Ind. Dummy	-0.019	-0.007	-0.025	-0.017	-0.050	-0.047	-0.030	-0.031
	(0.4009)	(0.7796)	(0.2327)	(0.5411)	(0.3764)	(0.5457)	(0.1599)	(0.2395)
Information Tech. Ind. Dummy	-0.061	-0.063	-0.076	-0.168	0.745	0.814	-0.078	-0.068
	(0.0240)**	(0.0281)**	(0.0254)**	(0.0001)***	(0.3026)	(0.3094)	(0.0016)***	(0.0362)**
Materials Ind. Dummy	-0.033	-0.085	-0.037	-0.161	0.041	-0.010	-0.081	-0.137
	(0.1498)	(0.0002)***	(0.0409)**	(0.0000)***	(0.4443)	(0.8910)	(0.0001)***	(0.0000)***
Telecommunications Ind. Dummy	-0.059	-0.010	-0.056	-0.116	-0.018	-0.065	-0.109	-0.085
	(0.1591)	(0.8309)	(0.0312)**	(0.0123)**	(0.9166)	(0.7665)	(0.0082)***	(0.0787)*
Utilities Ind. Dummy	0.003	0.011	-0.039	-0.049	-0.132	-0.194	-0.102	-0.081
	(0.9459)	(0.8803)	(0.2281)	(0.3459)	(0.5638)	(0.5269)	(0.1006)*	(0.2231)
Adj R^2	0.649	0.440	0.476	0.270	0.028	0.026	0.749	0.519
R^2	0.661	0.460	0.483	0.281	0.052	0.052	0.754	0.529
N: Panel (unbalanced)	782	704	1935	1698	1062	921	1303	1201
F-statistics	56.544***	23.109***	68.491***	26.131***	2.189***	1.966***	150.042***	52.712***

*,**,*** denotes signficance at 10%, 5% & 1% respectively

Finally, panel (unbalanced) analyses are conducted on Equations 3.10 to 3.13. Tables 6.6 and 6.7 present the analyses on Equation 3.10 and 3.11, and Equations 3.12 and 3.13 respectively. Again, the results are similar to those documented in Chapter 5.

Table 6.6
Panel (Unbalanced) Analysis: Determinants of Firm Leverage (With Financial Deficit)

The sample covers corporate financing behaviour from 1993 to 2005. Post-issue leverage is (pre-issue debt + net debt issued)/(pre-issued assets + net debt issued + net equity issued). Firms are defined as issuing a security when the net amount issued exceeds 5% of total assets. Dual issuers are firms issuing both debt and equity in the same fiscal year. Non-issuers are passive firms do not issue securities.

This table reports the coefficients of Panel Least Square regressions of which take the form of

$$\text{Post-issue Leverage}_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 BookLeverage_{t-1} + \beta_{IPO} IPO + \beta_6 FinancialDeficits_{t-1} + \beta_{FD} FDDummy + \beta_{IndDummies} IndustryDummies + error_t \quad (a)$$

$$\text{Post-issue Leverage}_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 LeverageDeficit_{t-1} + \beta_{IPO} IPO + \beta_6 FinancialDeficits_{t-1} + \beta_{FD} FDDummy + \beta_{IndDummies} IndustryDummies + error_t \quad (b)$$

The p-values are in brackets and are adjusted for heteroskedasticity (White, 1980).

Leverage deficit is the difference between the observed debt ratio and the target debt ratio. IPO dummy takes the figure of 1 if the firm-year observation is of an IPO firm duirng the period of 1993-2005, 0 otherwise. Financial deficit is the net amount of debt and equity whereas FDDummy takes the figure of 1 for a positive financial deficit and 0 for a negative financial deficit. The definitions for the rest of the independent variables are defined in Table 3.3 of Chapter 3.

	Dual Issuers		NON-Issuers		Debt Issuers		Equity Issuers	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Constant	0.261	0.463	0.015	0.391	0.045	0.464	0.087	0.339
	(0.0000)***	(0.0000)***	(0.4021)	(0.0000)***	(0.7440)	(0.0000)***	(0.0003)***	(0.0000)***
Market-to-book$_{pre\text{-}issue}$	-0.005	-0.002	0.009	0.026	-0.022	-0.024	-0.008	-0.005
	(0.1915)	(0.5947)	(0.2259)	(0.0019)***	(0.5038)	(0.4708)	(0.0001)***	(0.1045)
EBITDA$_{pre\text{-}issue}$	0.107	0.184	0.103	0.316	-2.147	-1.951	0.094	0.159
	(0.0000)***	(0.0000)***	(0.0044)***	(0.0000)***	(0.3067)	(0.3461)	(0.0000)***	(0.0000)***
Firm Size$_{pre\text{-}issue}$	0.007	0.044	0.008	0.033	0.230	0.259	0.038	0.088
	(0.1724)	(0.0016)***	(0.2836)	(0.0938)*	(0.2568)	(0.2080)	(0.000)***	(0.000)***
PPE$_{pre\text{-}issue}$	0.035	0.153	0.070	0.284	0.295	0.452	0.048	0.150
	(0.1069)	(0.0000)***	(0.1903)	(0.0000)***	(0.2221)	(0.0865)*	(0.0105)**	(0.0000)***
Book Leverage$_{pre\text{-}issue}$	0.555	-	0.851	-	0.915	-	0.553	-
	(0.0000)***	-	(0.0000)***	-	(0.0000)***	-	(0.0000)***	-
Leverage Deficit$_{pre\text{-}issue}$	-	0.353	-	0.651	-	0.760	-	0.404
	-	(0.0000)***	-	(0.0000)***	-	(0.0399)**	-	(0.0000)***
IPO Dummy	0.006	-0.039	-0.001	-0.048	0.265	0.257	-0.002	-0.054
	(0.5683)	(0.0077)***	(0.9563)	(0.0053)***	(0.2811)	(0.2844)	(0.7658)	(0.0000)***
Financial Deficit$_{pre\text{-}issue}$	-0.008	-0.011	-0.004	-0.005	-0.425	-0.446	-0.001	-0.003
	(0.0165)**	(0.0248)**	(0.4163)	(0.6213)	(0.3901)	(0.3818)	(0.1531)	(0.1475)
FD Dummy	-0.010	-0.003	-0.005	-0.014	-0.048	-0.031	0.004	-0.010
	(0.4647)	(0.8552)	(0.6589)	(0.3464)	(0.6206)	(0.7533)	(0.6257)	(0.3832)
Consumer Staples Ind. Dummy	-0.023	-0.004	-0.011	-0.039	0.028	0.049	-0.021	-0.023
	(0.3611)	(0.8681)	(0.2322)	(0.0394)**	(0.6036)	(0.4037)	(0.4093)	(0.4548)
Energy Ind. Dummy	-0.057	-0.092	-0.008	-0.132	0.099	0.051	-0.057	-0.128
	(0.0362)**	(0.0012)***	(0.4303)	(0.0000)***	(0.3590)	(0.6229)	(0.0136)**	(0.0000)***
Health Ind. Dummy	-0.027	-0.023	-0.012	-0.108	0.059	-0.015	-0.056	-0.090
	(0.3457)	(0.4462)	(0.3596)	(0.0002)***	(0.6164)	(0.8947)	(0.0210)**	(0.0013)***
Industrials Ind. Dummy	-0.023	-0.006	-0.032	-0.017	-0.065	-0.035	-0.019	-0.032
	(0.3396)	(0.7993)	(0.1647)	(0.5509)	(0.3415)	(0.6022)	(0.3835)	(0.2240)
Information Tech. Ind. Dummy	-0.063	-0.063	-0.075	-0.168	0.803	0.777	-0.066	-0.069
	(0.0287)**	(0.0278)**	(0.0472)**	(0.0001)***	(0.2936)	(0.3044)	(0.0121)**	(0.0346)**
Materials Ind. Dummy	-0.040	-0.086	-0.041	-0.162	0.039	-0.038	-0.070	-0.137
	(0.0975)*	(0.0002)***	(0.0406)**	(0.0000)***	(0.5307)	(0.5419)	(0.0018)***	(0.0000)***
Telecommunications Ind. Dummy	-0.060	-0.019	-0.056	-0.117	0.113	0.047	-0.100	-0.086
	(0.1920)	(0.6675)	(0.0540)*	(0.0121)**	(0.6230)	(0.8299)	(0.0167)**	(0.0773)*
Utilities Ind. Dummy	0.018	0.008	-0.050	-0.051	-0.208	-0.240	-0.039	-0.083
	(0.6995)	(0.9133)	(0.1804)	(0.3394)	(0.4093)	(0.3677)	(0.3739)	(0.2167)
Adj R^2	0.647	0.444	0.428	0.270	0.039	0.035	0.745	0.519
R^2	0.661	0.465	0.437	0.281	0.068	0.063	0.750	0.530
N: Panel (unbalanced)	704	704	1698	1698	921	921	1201	1201
F-statistics	48.793***	21.798***	47.995***	24.226***	2.400***	2.232***	130.543***	48.908***

*,**,*** denotes signficance at 10%, 5% & 1% respectively

Table 6.7
Panel (Unbalanced) Analysis: Determinants of The Form of Financing

The sample covers security issuance behaviour from 1993 to 2005. This table reports logit regressions using panel (unbalanced) data. The p-values are in brackets.

$D^*_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 BookLeverage_{t-1} + \beta_{IPO} IPO + \beta_{IndDummies} IndustryDummies + error_t$ (a)

$D^*_t = \alpha + \beta_1 M/B_{t-1} + \beta_2 EBITDA_{t-1} + \beta_3 SIZE_{t-1} + \beta_4 PPE_{t-1} + \beta_5 LeverageDeficit_{t-1} + \beta_{IPO} IPO + \beta_{IndDummies} IndustryDummies + error_t$ (b)

Independent variable	**Dual Issue vs Equity Issue**		**Debt Issue vs Equity Issue**		**Debt Issue vs Dual Issue**	
	(a)	(b)	(a)	(b)	(a)	(b)
CONSTANT	0.015 (0.9594)	-0.376 (0.2014)	-0.036 (0.8904)	-0.236 (0.3743)	-0.160 (0.5478)	0.216 (0.4208)
Market-to-book$_{pre\text{-}issue}$	0.215 (0.0000)***	0.201 (0.0000)***	-0.026 (0.5364)	-0.018 (0.6948)	-0.256 (0.0000)***	-0.238 (0.0000)***
EBITDA$_{pre\text{-}issue}$	0.560 (0.0094)**	0.351 (0.1154)	3.136 (0.0000)***	3.165 (0.0000)***	2.255 (0.0000)***	2.738 (0.0000)***
Firm Size$_{pre\text{-}issue}$	0.151 (0.0456)***	0.132 (0.0875)*	0.430 (0.0000)***	0.523 (0.0000)***	0.219 (0.0043)***	0.271 (0.0008)***
PPE$_{pre\text{-}issue}$	0.147 (0.5028)	-0.066 (0.7704)	1.096 (0.0000)***	1.055 (0.0000)***	1.124 (0.0000)***	1.382 (0.0000)***
Book Leverage$_{pre\text{-}issue}$	-0.879 (0.0000)***	- -	-0.138 (0.5058)	- -	1.097 (0.0000)***	- -
Leverage Deficit $_{pre\text{-}issue}$	- -	-0.866 (0.0005)***	- -	-1.203 (0.0001)***	- -	0.228 (0.4763)
IPO Dummy	0.006 (0.9537)	0.092 (0.4200)	-0.064 (0.5768)	-0.197 (0.1189)	-0.159 (0.1998)	-0.405 (0.0027)***
Consumer Staples Ind. Dummy	-0.104 (0.7287)	-0.129 (0.6864)	0.051 (0.8421)	0.154 (0.5781)	0.225 (0.3771)	0.376 (0.1681)
Energy Ind. Dummy	-0.916 (0.0019)***	-0.859 (0.0056)***	-0.907 (0.0006)***	-0.882 (0.0018)***	-0.114 (0.6804)	-0.144 (0.6290)
Health Ind. Dummy	-1.224 (0.0001)***	-1.277 (0.0002)***	-0.744 (0.0087)***	-0.802 (0.0093)***	0.383 (0.2208)	0.338 (0.3233)
Industrials Ind. Dummy	-0.349 (0.2207)	-0.402 (0.1835)	-0.215 (0.3803)	-0.274 (0.2985)	0.113 (0.6464)	0.159 (0.5461)
Information Tech. Ind. Dummy	-0.349 (0.2498)	-0.290 (0.3650)	-0.262 (0.3500)	-0.228 (0.4512)	0.092 (0.7451)	0.064 (0.8330)
Materials Ind. Dummy	-0.865 (0.0015)***	-0.715 (0.0127)**	-1.067 (0.0000)***	-0.982 (0.0001)***	-0.227 (0.3410)	-0.297 (0.2427)
Telecommunications Ind. Dummy	0.189 (0.6573)	0.065 (0.8831)	-0.571 (0.2188)	-0.718 (0.1578)	-0.549 (0.2078)	-0.569 (0.2367)
Utilities Ind. Dummy	-0.119 (0.8481)	-0.097 (0.8850)	0.155 (0.7841)	0.212 (0.7336)	0.042 (0.9449)	0.049 (0.9419)
McFadden R-squared	0.043	0.039	0.214	0.232	0.172	0.177
Dep. Variable = 1	782	704	1062	921	1062	921
Dep. Variable = 0	1303	1201	1303	1201	782	704

*,**,*** denotes signficance at 10%, 5% & 1% respectively

[6.4] Conclusion

The results presented in Chapters 4 and 5 may be subject to possible correlations among the inter-firm year observations and heterogeneity. Hence, further robustness checks are made to control for the above potential statistical problems. However, the results from the robustness checks show that both the findings from Chapters 4 and 5 and the robustness tests are similar. The inferences made on the basis presented in this dissertation are robust to a variety of methodological treatments.

Chapter Seven
Conclusion

"… Now in fire attacks one must respond to the changing situation" – Sun Zi[1]

[7.1] Introduction

This dissertation addresses the question of *how corporate financial policies are derived and determined*. Past research in capital structure has provided mixed evidence[2] on the determinants of capital structure because the methodologies used to explore this issue have, as this dissertation has argued[3], been deficient. I have argued that the methodology used in this dissertation allows for the valid comparison of competing theories of capital structure. Further, due to the lack of Australian studies on the market timing theory, this dissertation presents a direct test on the use of market timing strategy by Australian firms.

Chapter 2 provides an overview of the extant literature in the area of capital structure. Chapter 3 describes the methodology and the data set employed in this dissertation. Chapter 4 examines the impact of market timing on Australian firms' by using initial public offering firms to isolate timing attempts. Chapter 5 extends the sample data to include firms already listed on the Australian Securities Exchange and conducts a horse race on the various theories of capital structure. Chapter 6 employs controls for possible

[1] Griffith (1971) page 141.
[2] See Chapter 2 - "Literature review on capital structure", for the discussion of the mixed evidence provided by past research.
[3] See Chapter 3 - "Methodology and data", for the discussion on the experimental design problem faced by past research.

correlations on the data and conducts a panel (unbalance) analysis to further compare the results obtained in Chapters 4 and 5. These additional tests aim to provide a robustness test for the inferences made in Chapters 4 and 5. This chapter concludes the findings of this dissertation and outlines potential future research areas.

[7.2] Summary Of Major Findings

Chapter 4 explores the impact of market timing on Australian firms by using IPO firms to isolate timing attempts. Consistent with Alti's (2006) findings and as predicted by the market timing hypothesis, the results in Chapter 4 indicate that Australian "hot" market firms do take advantage of the market conditions to issue more equity than their "cold" market firms. Therefore, this is consistent with the predictions of the market timing hypothesis. This "hot" effect is not a result of the "hot" market firms (being over-levered) trying to adjust their leverage prior to their initial offerings. Neither is the effect due to the "hot" market firms raising more equity because of higher future investment opportunities than their "cold" market counterparts.

Furthermore, past studies have documented that if market timing behaviour exists, then the impact of market timing on the capital structure, in particular leverage, in the IPO year is likely to be negative. Firms will issue less debt and more equity for external funds to take advantage of favourable market condition (to issue equity). Rather than the negative relationship of leverage to favourable market condition predicted by the market timing hypothesis, the analysis in Chapter 4 does not find such relationship. There is

also a high net debt issue in the IPO year which is at odds with the market timing hypothesis.

Finding mixed evidence for market timing behaviour and that dual issuers (i.e. companies which issue equity and debt concurrently in the same financial year) are common, further empirical tests are conducted to explore the determinants of firm leverage. This allows us to disentangle how competing capital structure theories (especially the market timing theory) can explain those determinants' relationship with the leverage. In particular, the data is split into four groups of issuers (issuers of debt, equity, dual issuers and firms that do not issue debt or equity). Such groupings allow a comparison of the theories of capital structure where they do not share the same predictions so that an inference can be drawn on which theory best explains the Australian data.

The analysis in Chapter 4 rejects the pecking order theory and confirms that Australian firms are opportunistic funds raisers. However, the results suggest that their behaviour is consistent with them having target debt ratios that are consistent with these firms trading-off the costs and the benefits of debt *versus* equity. This finding confirms that market timing is a "means to the end" of achieving a target leverage structure.

The use of IPO data in Chapter 4 may be subject to selection bias which may produce a result that is favourable towards a market timing hypothesis finding. This is because of

the presence of higher information asymmetry relating to IPO firms[4], hence market timing strategy is more likely to be employed by the managers.

As such, Chapter 5 extends the sample data by including Australian listed firms which are not floated for the first time. Similar to Chapter 4, the data is also separated into the issuers of debt, equity, dual issuers and firms that do not issue debt or equity to analyse the determinants of firm leverage and to see how various theories of capital structure can explain the determinants' relationship with the leverage. Frank and Goyal (2003) argue that most empirical tests have various weaknesses and therefore, it is important to examine the predictions of a theory from a number of points of view rather than relying solely on a single test. Hence, leverage deficit and financial deficit are added to the analysis to further test the explanatory power of trade-off and pecking order theories.

Consistent with the results obtained in Chapter 4, the analysis reported in Chapter 5 confirm that Australian firms behave opportunistically when raising funds. The pecking order theory is again rejected. Rather than following a pecking order hierarchy, managers seize the moment to exploit the firm's characteristics which facilitate a particular capital-raising strategy at a particular time. However, in the long run, firms appear to have a target debt ratio which is determined by various tradeoffs between the costs and benefits of debt *versus* equity. Therefore, managers act opportunistically to achieve strategic goals.

[4] See Chapter 3 - "Methodology and data", for the discussion on the tests of market timing using IPO data.

Further tests using different statistical techniques are conducted in Chapter 6 to test the robustness of the inferences made in Chapters 4 and 5. The results obtained in Chapter 6 are similar to those reported in Chapters 4 and 5. This demonstrates that the results obtained in this dissertation are robust to a variety of empirical approaches.

[7.3] Limitations of This Research

One of the implications of the findings presented in this dissertation is that managers are unlikely to make their decisions in a vacuum. While managers may have a long-term target leverage ratio, they are likely to exploit favourable factors and minimise the effects of unfavourable influences to achieve their objective with minimal (or no) use of resources. This suggests that a dynamic methodology is required when exploring how various theories of capital structure can be used to explain managers' corporate financing policies in an empirical research. While this dissertation seeks to establish a capital structure theory that best describes the optimal financing policies determined by the Australian listed firms, this dissertation acknowledges that various theories of capital structure are often are derived in a static, rather than dynamic, framework. Therefore, the results presented in this dissertation may only be used to infer aggregate behaviour of the managers in deciding their corporate financing policies over a period of time, rather than at a point in time.

The definition of "hot" and "cold" IPO markets in this dissertation is constructed by looking at the number of IPOs in a given month and then by identifying IPOs in months that are above the median as being "hot" months and those beneath the median as "cold"

months (see Section 4.2 in Chapter 4 for a detailed discussion). Such a definition assumes that the managers are able to time the market when listing their firms and defines the states of "hot" and "cold" with respect to the IPO market itself. However, there is likely to be a delay between the time when managers decided to float their shares and the time the shares are actually floated for the first time which may bias the analysis presented in this dissertation. An alternative definition, suggested by an examiner, might be based on the state of the stock market, for example the return of the stock market over the previous six months. This alternative definition may address the underlying economic characteristics of the states of "hot" and "cold". However, as pointed out by the same examiner, such a definition has to be coupled with the level of the stock market as there may be a difference between the stock market performing well as it works its way out of a slump *versus* the stock market performing well at the top of a bull market.

[7.4] Directions For Future Research

The major focus of this research is to establish a capital structure theory that best describes the financing policies of Australian listed firms. It documents that a mixture of capital structure theories can explain the financial policies of Australian listed firms. However, the long-term financing policies set by the firms appear to target a debt ratio which is determined by various trade-offs between the costs and the benefits of debt versus equity. There are many possibilities by which this dissertation can be extended for future research.

Firstly, there is a growing body of literature suggesting that good corporate governance may lower the cost of equity (Ashbaugh-Skaife *et al.*, 2006 and Brown and Caylor, 2006). This is because investors may reward firms which are better governed by paying a high price premium, as there is lower information asymmetric problem. Given that many countries have established their own set of corporate governance standards and principles (such as the Sarbanes-Oxley legislation in the US, the OECD Corporate Governance Principles and the Australian "Principles Of Good Corporate Governance And Best Practice Recommendations" issued by ASX), it is plausible that corporate governance may affect the firms' financial policies. In particular, if managers recognised that good corporate governance is a means to lower the cost of capital, then corporate governance can be another important determinant of capital structure. The analysis in Chapters 4 and 5 reject the presence of a pecking order behaviour. Since the central prediction of the pecking order hypothesis lies in the concept of information asymmetry, the rejection of the pecking order theory may be the result of a good corporate governance environment in Australia. If there is no information asymmetry problem, then firms are able to raise external financing relatively cheaply. Thus, firms may be indifferent between raising funds through debt or equity and the financing hierarchy as predicted by the pecking order hypothesis will no longer be important.

Nonetheless, the inclusion of a corporate governance variable in this dissertation is not possible due to the lack of appropriate data for Australia. Currently, there are a number of data providers which have arisen to advise firms on governance matters and evaluate the strength of their corporate governance. Institutional Shareholder Services (ISS) above all, is the largest corporate governance data provider which creates a firm-specific

governance index and its database includes firms across the whole globe. However, while the ISS began collecting firm-specific corporate governance data from the firms' proxy statement in mid 2002, its database of Australian firms begins only in late 2005. This lack of Australian data should improve in the future as the ISS database grows, thus allowing an extension to this dissertation.

Secondly, the capital structure decision is unlikely to be a goal on its own. Rather, it should be a function of the overarching strategic goals of the firm. In the "traditional" case of firms which strive for the maximization of the value of their shares for the current shareholders, all choices concerning the capital structure should be evaluated in terms of their effect on the firm's market value. Essentially, this dissertation finds evidence that Australian firms have a long term target leverage ratio that follows trade-off behaviour. Under the trade-off theory, it is assumed that shareholder wealth maximization is the one and only corporate objective. Therefore, given that Australian firms have an average book leverage ratio of 45.5% (as reported in Table 5.3 in Chapter 5), this implies that the average book leverage ratio of 45.5% is the optimal leverage level to maximize the firms' value on average. However, Jensen (1989) argues that highly-leverage firms will respond faster to a decline in firm value than their less-leveraged counterparts because a small decline in value can lead to default. This argument implies that a highly leveraged firm is more likely to restructure its operations and its financial claims quickly, preserving its value as a going concern.[5]

[5] When leverage is initially low, defaults occur only after continuing losses drive firm value substantially below the pre-distress level. With low leverage, a firm is less likely to respond to short term operational distress and will therefore lose more of its going-concern value.

Therefore, another possible extension to this dissertation is to explore the relationship between the Australian firms' capital structure and their response[6] to distress. If an Australian firm's target leverage ratio is relatively higher than the average of 45.5%, then Jensen's (1989) argument that higher pre-distress leverage increases the speed with which a firm reacts to poor profit performance should hold for such firm as well. Firms will be more responsive towards distress events such as a huge decrease in profits or an economic event that may affect the firm's finances. An experimental design might be constructed to compare the firms' response to distress between firms with higher pre-distress leverage and firms with lower pre-distress leverage. Such an extension of this dissertation will facilitate a fuller understanding of the systematic differences between successful and failing[7] listed firms in Australia. A successful firm may be one which has a high leverage ratio but responds swiftly to distress or one which has a low leverage ratio.

[6] Firms can respond operationally or financially towards distress. By responding operationally, firms can take actions such as restructuring assets and laying off employees when profit performance deteriorates. Alternatively, firms can respond financially through dividend cuts or debt restructuring.
[7] A failing listed firm maybe one that is delisted from the ASX due to bankruptcy.

Bibliography

Alexander, G., Stover, R. and Kuhnau, D., 1979. Market Timing Strategies In Convertible Debt Financing, Journal of Finance, 34 (1), 143-155.

Allen, D., 1991. The Determinants Of The Capital Structure Of Listed Australian Companies: The Financial Manager's Perspective, Australian Journal of Management, 16 (2), 103-127.

Alti, A., 2006. How Persistent Is The Impact Of Market Timing On Capital Structure?, Journal of Finance, 61 (4), 1681-1710.

Amemiya, T., 1973. Regression Analysis When The Dependent Variable Is Truncated Normal, Econometrica, 41(6), 997–1016.

Ang, J., Chua, J. and McConnell, J., 1982. The Administrative Costs Of Corporate Bankruptcy: A Note, Journal of Finance, 37 (1), 219-226.

Ashbaugh-Skaife, H., Collins, D. and LaFond, R., 2004. Corporate Governance and the Cost of Equity Capital, December 2004, Available at SSRN: http://ssrn.com/abstract=639681

Auerbach, A., 1985. Real Determinants Of Corporate Leverage, in: Friedman, B.M. (Ed.), Corporate Capital Structures In The United States, University of Chicago Press, Chicago, IL.

Baker, M. and Wurgler, J., 2002. Market Timing And Capital Structure, Journal of Finance, 57 (1), 1-32.

Barclay, M., Smith, C., Watts, R., 1995. The Determinants Of Corporate Leverage And Dividend Policies, Journal of Applied Corporate Finance, 7 (4), 4-19.

Baumol, W., 1965. The Stock Market And Economic Efficiency, Fordham University Press, New York.

Bayless, M. and Chaplinsky, S., 1996. Is There A Window Of Opportunity For Seasoned Equity Issuance?, Journal of Finance, 51 (1), 253-278.

Bennett, M. and Donnelly, R., 1993. The Determinants Of Capital Structure: Some UK Evidence, British Accounting Review, 25, 43-59.

Berle, A. and Means, G, 1932. The Modern Corporation and Private Property, Harcourt, Brace & World, New York.

Black, F., 1976. The Dividend Puzzle, Journal of Portfolio Management, 2, 5–8.

Blazenko, G., 1987. Managerial Preference, Asymmetric Information, and Financial Structure, Journal of Finance, 42(4), 839-862.

Bowman, J., 1980. The Importance Of A Market Value Measurement Of Debt In Assessing Leverage, Journal of Accounting Research, 18(1), 242-254.

Bradley, M., Jarrell, G. and Kim, E., 1984. On The Existence Of An Optimal Capital Structure: Theory And Evidence, Journal of Finance, 39(3), 857-878.

Brailsford, T., Heaney, R., and Shi, J., 2000. The Cyclical Behaviour Of The IPO Market In Australia, Working paper, Australian National University.

Brailsford, T., Heaney, R., Powell, J. and Shi, J., 2000, Hot And Cold IPO Markets, Working paper, Australian National University.

Brown, L. and Caylor, M., 2006. Corporate Governance And Firm Valuation, Journal of Accounting And Public Policy, 25, 409-434.

Castanias, R., 1983. Bankruptcy Risk And The Optimal Capital Structure, Journal of Finance, 38(5), 1617-1635.

Chiarella, C., Pham, T., Sim, A. and Tan, M., 1992. Determinants Of Corporate Capital Structure: Australian Evidence, in: Rhee, S., Change R. (Eds), Pacific Basin Capital Market Research, Vol. 3, Elsevier Science Publishers, Amsterdam.

Chirinko, R. and Singha, A., 2000. Testing Static Tradeoff Against Pecking Order Models of Capital Structure: A Critical Comment, Journal of Financial Economics, 58(3), 417-425.

Crutchley, C. and Hansen, R., 1989. A Test Of The Agency Theory Of Managerial Ownership, Corporate Leverage And Corporate Dividends, Financial Management, 18(4), 36-46.

DeAngelo, H. and Masulis, R., 1980. Optimal Capital Structure Under Corporate And Personal Taxation, Journal of Financial Economics, 8(1), 3 - 29.

Dharan, B. and Ikenberry, D., 1995. The Long-Run Negative Drift Of Post-Listing Stock Returns, Journal of Finance, 50 (5), 1547-1574.

Donaldson, G., 1961. Corporate Debt Capacity, Harvard, Harvard University Press.

Donaldson, G., 1969. Strategy For Financial Mobility, Harvard, Harvard Business School Press.

Donaldson, G., 1984. Managing Corporate Wealth, Praegar, New York.

Durand, R., Koh, S., Watson, I., 2001. Who Moved Asian-Pacific Stock Markets? A Further Consideration Of The Impact Of The US And Japan, Australian Journal of Management, 26 (2), 125-146.

Durand, R., Limkriangkrai, M. and Smith, G., 2006. In America's Thrall, Accounting & Finance, 46 (4), 577-604.

Fama, E. and French, K., 2002. Testing Trade-off And Pecking Order Predictions About Dividends And Debt, The Review of Financial Studies, 15(1), 1-33.

Fama, E. and French, K., 2005. Financing Decisions: Who Issues Stock?, Journal of Financial Economics, 76 (3), 549-582.

Fan, J., Titman, S. and Twite, G., 2004. An International Comparison Of Capital Structure And Debt Maturity Choices, Working Paper, Australian Graduate School of Management.

Flannery, M. and Rangan, K., 2006. Partial Adjustment Toward Capital Structures, Journal of Financial Economics, 79(3), 469-506.

Foo, C. and Grinyer, P., 2000. Organising Strategy: Sun Tzu Business Warcraft, Horizon Books, Singapore.

Frank, M. and Goyal, V., 2003. Testing The Pecking Order Of Capital Structure, Journal of Financial Economics, 67 (2), 217-248.

Friend, I. and Hasbrouck, J., 1988. Determinants Of Capital Structure, in Andy Chen (ed), Research In Finance, Vol.7, 1-19, JAI Press, New York

Galai, D. and Masulis, R., 1976. The Option Pricing Model and The Risk Factor of Stock, Journal of Financial Economics, 3(1-2), 53-81.

Graham, J. and Harvey, C., 2001. The Theory And Practice Of Corporate Finance: Evidence From The Field, Journal of Financial Economics, 60 (2-3), 187-243.

Greene, T., 1897. Corporation Finance, G.P, Putnam's Sons, New York, 1897.

Greene, W., 2003. Econometric Analysis, 5th edition, Prentice Hall.

Griffith, S., 1971. Sun Tzu: The Art of War, Oxford University Press, US.

Grossman, S. and Hart, O., 1982. Corporate Financial Structure and Managerial Incentives, in J.McCall (ed.): The Economics of Information and Uncertainty, University of Chicago Press, Chicago.

Hovakimian, A., 2006. Are Observed Capital Structures Determined By Equity Market Timing?, Journal of Financial and Quantitative Analysis, 41 (1), 221-243.

Hovakimian, A., Hovakimian, G. and Tehranian, H., 2004. Determinants Of Target Capital Structure: The Case Of Dual, Debt And Equity Issues, Journal of Financial Economics, 71 (3), 517-540.

Hovakimian, A., Opler, T. And Titman, S.. 2001. The Debt–Equity Choice, Journal of Financial and Quantitative Analysis, 36 (1), 1–24.

How, J., Izan, H. and Monroe, G., 1995. Differential Information And The Underpricing Of Initial Public Offerings: Australian Evidence, Accounting and Finance, 35 (1), 87-106.

Huang, R. and Ritter, J., 2007. Testing Theories Of Capital Structure And Estimating The Speed Of Adjustment, Journal of Financial and Quantitative Analysis (forthcoming).

Ibbotson, R. and Jaffe, J., 1975. Hot Issue Markets, Journal of Finance, 30(4), 1027-1042.

Ibbotson, R., 1975. Price Performance Of Common Stock New Issues, Journal of Financial Economics, 2(3), 235-272.

Jain, B. and Kini, O., 1994. The Post-Issue Operating Performance Of IPO Firms, Journal of Finance, 49 (5), 1699-1726.

Jalilvand, A. and Harris, R., 1984. Corporate Capital Behavior In Adjusting To Capital Structure And Dividend Targets: An Econometric Study, Journal of Finance, 39 (1), 127-145.

Jensen, M. and Meckling, W., 1976. Theory Of The Firm: Managerial Behavior, Agency Costs And Ownership Structure, Journal of Financial Economics, 3 (4), 305-360.

Jensen, M. and Zimmerman, J., 1985. Management Compensation And The Managerial Labor Market, Journal of Accounting and Economics, 7(1-3), 3-9.

Jensen, M., 1986. Agency Cost Of Free Cash Flow, Corporate Finance, And Takeovers, American Economic Review, 76 (2), 323-329.

Jensen, M., 1989. Active Investors, LBO's And Privatization Of Bankruptcy, Journal of Applied Corporate Finance, 2, 3-24.

Kayhan, A. and Titman, S., 2007. Firms' Histories And Their Capital Structure, Journal of Financial Economics, 83 (1), pp. 1-32.

Kester, C., 1986. Capital And Ownership Structure: A Comparison Of United States And Japanese Manufacturing Corporations, Financial Management, 15, 5-16.

La Porta, R., Lopez-de-Silanes, F. Shleifer, A. and Vishny, R., 1998. Law and Finance, Journal of Political Economy, 106, 1113–1155.

Leary, M. and Roberts, M., 2005. Do Firms Rebalance Their Capital Structure?, Journal of Finance, 60(6), 2575-2619.

Long, M. and Malitz, I., 1985. Investment Patterns And Financial Leverage, in B.M. Friedman (ed.), National Bureau of Economic Research: Corporate Capital Structures In The United States, The Chicago University Press (1985).

MacKie-Mason, J., 1990. Do Taxes Affect Corporate Financing Decisions?, Journal of Finance, 45(5), 1471-1493.

Marsh, P., 1982. The Choice Between Equity And Debt: An Empirical Study, Journal of Finance, 37(1), 121-144.

McDonald, J. and Fisher, A., 1972. New Issue Stock Price Behaviour, Journal of Finance, 27(1), 97-102.

Mead, E., 1910. Corporation Finance, Appleton and Co , New York, 1910.

Mikkelson, W., Partch, M. and Shah, K., 1997. Ownership And Operating Performance Of Companies That Go Public, Journal of Financial Economics, 44 (3), 281-307.

Miller, M. and Modigliani, F., 1966. Some Estimates Of The Cost Of Capital To The Utility Industry 1954-7, American Economic Review, 56(3), 333-391.

Miller, M., 1977. Debt and Taxes, Journal of Finance, 32(2), 261-275.

Modigliani, F. and Miller, M., 1958. The Cost Of Capital, Corporation Finance And The Theory Of Investment, American Economic Review, 48(3), 261-297.

Modigliani, F. and Miller, M., 1961. Dividend Policy Growth and the Valuation of Shares, Journal of Business, 34(4), 411-433.

Modigliani, F. and Miller, M.., 1963. Corporate Income Taxes And The Cost Of Capital: A Correction, American Economic Review, 53 (3), 433-443.

Myers, S. and Majluf, N., 1984. Corporate Financing And Investment Decisions When Firms Have Information That Investors Do Not Have, Journal of Financial Economics, 13 (2), 187-221.

Myers, S., 1977. Determinants Of Corporate Borrowing, Journal of Financial Economics, 5 (2), 147-175.

Myers, S., 1984. The Capital Structure Puzzle, Journal of Finance, 39 (3), pp 575-592.

Myers, S., 1993. Still Searching For Optimal Capital Structure, Journal of Applied Corporate Finance 1(6), 4-14.

Myers, S., 2001. Capital Structure, Journal of Economic Perspectives, 15(2), 81-102.

Opler, T. and Titman, S., 1994. The Debt-Equity Choice: An Analysis Of Issuing Firms, Working Paper, Boston College.

Pagano, M., Panetta, F. And Zingales, L., 1998. Why Do Companies Go Public? An Empirical Analysis, Journal of Finance, 53 (1), 27-64.

Ragunathan, V., Faff, R. and Brooks, R., 1999. Correlations, Business Cycles And Integration, Journal of International Financial Markets, Institutions and Money, 9, 75-95.

Rajan, R. and Zingales, L., 1995. What Do We Know About Capital Structure? Some Evidence From International Data, Journal of Finance, 50 (5), 1421-1460.

Reilly, F. and Hatfield, K., 1969. Investor Experience With New Stock Issues, Financial Analysis Journal, 25(5), 73-80.

Ritter, J., 1984. The 'Hot Issue' Market of 1980, Journal of Business, 57 (2), 215-240.

Ross, S., 1977. The Determination Of Financial Structure: The Incentive-Signaling Approach, Journal of Economics, 8, 23-40.

Schoubben, F. and Van Hulle, C., 2004. The Determinants Of Leverage; Differences Between Quoted And Non Quoted Firms, Tijdschrift Voor Economie En Management, Vol. 49, 4, 589 - 622.

Schwartz , E. and Aronson, R., 1967. Some Surrogate Evidence In Support Of The Concept Of Optimal Financial Structure, Journal of Finance, 22, 10-18.

Scott, J., 1977. Bankruptcy, Secured Debt, And Optimal Capital Structure, Journal of Finance, 32(1), 1-19.

Shapiro, A. and Titman, S., 1985. An Integrated Approach To Corporate Risk Management, Midland Corporate Finance Journal, 3, 41-56.

Sharpe, I. and Pooley, G., 1990. Asymmetric Information, Adjustment Costs And Capital Structure Of Australian Finance Companies, Working Paper, School of Banking And Finance, University of New South Wales.

Shyam-Sunder, L. and Myers, S., 1999. Testing Static Tradeoff Against Pecking Order Models Of Capital Structure, Journal of Financial Economics, 51(2), 219-244.

Smith, C. and Watts, R., 1992. The Investment Opportunity Set And Corporate Financing, Dividend, And Compensation Policies, Journal of Financial Economics, 32(3), 263-292.

Stulz, R., 1990. Managerial Discretion And Optimal Financing Policies, Journal of Financial Economics, 26 (1), 3-28.

Suchard, J. and Singh, M., 2006. The Determinants of The Hybrid Security Issuance Decision For Australian Firms, Pacific-Basin Finance Journal, 14 (3), 269-290.

Taggart, R. Jr, 1977. A Model of Corporate Financing Decisions, Journal of Finance, 32 (5), 1467-1484.

Titman, S. and Wessels, R., 1988. The Determinants of Capital Structure Choice, Journal of Finance, 43 (1), 1-19.

Titman, S., 1984. The Effect Of Capital Structure On A Firm's Liquidation Decision, Journal of Financial Economics, 13(1), 137 – 151.

Tobin, J., 1958. Estimation For Relationships With Limited Dependent Variables, Econometrica, 26 (1), 24–36.

Warner, J., 1977. Bankruptcy Costs: Some Evidence, Journal of Finance, 32 (2), 337-347.

Wee, C., 2003. Sun Zi Art of War: An Illustrated Translation with Asian Perspectives and Insights, Pearson, Prentice Hall, Singapore.

Appendix A: Summary Statistics of IPO Firm Characteristics and Financing Decisions (Type of Issuers)

The table reports the means and the standard deviations of several IPO firm characteristics for the various type of issuers. *Leverage D/A* is book debt to assets. *Net Debt Issue d/A* is defined as the changes in book debt divided by assets. Net Equity Issues e/A is defined as the change in book equity minus the change in retained earnings divided by assets. Newly retained earnings (ΔRE/A) is the change in retained earnings divided by assets. *Market-to-book ratio M/B* is defined as book debt plus market value of equity divided by assets. Profitability is measured by *EBITDA*, which is earnings before interest, taxes and depreciation divided by assets. *SIZE* is measured by Operating Revenue divided by assets. *Asset tangibility PPE*, is defined as net plant, property and equipment divided by assets. *INV* denotes capital expenditure (which is proxied by Current and non Current *Investments*) to assets ratios. *DIV* is ordinary dividends divided by book equity. *CASH* is defined as cash and current investments divided by assets. Firm-year observations that consititute outliers with respect to book leverage, market-to-book ratio, net debt, net equity issues, profitability, investment and dividends are dropped from the sample.

	N		Book Leaverage D/A	Net Debt d/A	Net Equity e/A	Newly Retained Earnings ΔRE/A	Mkt to book ratio M/B	EBITDA	Size	PPE	INV	DIV	Cash
Dual Issuers	204	Mean	0.44	0.23	0.28	-0.11	1.91	-0.02	0.70	0.20	0.03	0.02	0.18
		StDev	*(0.22)*	*(0.17)*	*(0.21)*	*(0.22)*	*(1.17)*	*(0.22)*	*(0.94)*	*(0.22)*	*(0.10)*	*(0.07)*	*(0.20)*
Non-issuers	364	Mean	0.36	-0.07	0.00	-0.09	1.61	0.03	1.16	0.19	0.04	0.03	0.24
		StDev	*(0.24)*	*(0.14)*	*(0.04)*	*(0.22)*	*(1.14)*	*(0.25)*	*(1.39)*	*(0.21)*	*(0.14)*	*(0.11)*	*(0.26)*
Debt Issuers	253	Mean	0.56	0.17	-0.01	-0.06	1.91	0.06	1.43	0.22	0.04	0.04	0.16
		StDev	*(0.20)*	*(0.12)*	*(0.11)*	*(0.23)*	*(1.30)*	*(0.23)*	*(1.20)*	*(0.21)*	*(0.15)*	*(0.12)*	*(0.19)*
Equity Issuers	253	Mean	0.23	-0.07	0.32	-0.20	1.89	-0.12	0.50	0.16	0.04	0.01	0.26
		StDev	*(0.23)*	*(0.15)*	*(0.22)*	*(0.24)*	*(1.33)*	*(0.24)*	*(0.90)*	*(0.21)*	*(0.14)*	*(0.06)*	*(0.24)*

Appendix B: Summary Statistics of Firm Characteristics and Financing Decisions (Type of Issuers)

The table reports the means and the standard deviations of firm year observations of the IPO and non-IPO firms. Table 3.3 of Chapter 3 defines the definition of the variables used in this thesis. Book Leverage (D/A) is book debt to assets. Net Debt Issue (d/A) is defined as the changes in book debt divided by assets. Net Equity Issues (e/A) is defined as the change in book equity minus the change in retained earnings divided by assets. Newly retained earnings (ΔRE/A) is the change in retained earnings divided by assets. Market-to-book ratio (M/B) is defined as book debt plus market value of equity divided by assets. Profitability is measured by (EBITDA), which is earnings before interest, taxes and depreciation divided by assets. Firm size (SIZE) is measured by Operating Revenue divided by assets. Asset tangibility (PPE), is defined as net plant, property and equipment divided by assets. (INV) denotes capital expenditure which is proxied by Current and non Current Investments to assets ratios. (DIV) is ordinary dividends divided by book equity. (CASH) is defined as cash and current investments divided by assets. Leverage deficit is the difference between the observed debt ratio and a target debt ratio. Financial deficit is the sum of net equity and net debt.

	N		Book Leaverage D/A	Net Debt d/A	Net Equity e/A	Newly Retained Earnings ΔRE/A	Mkt to book ratio M/B	EBITDA	Size	PPE	INV	DIV	Cash	Leverage deficit	Financial deficit
ALL Firms															
Dual Issuers	782	Mean	0.47	0.23	0.31	-0.23	2.27	-0.11	0.47	0.21	0.06	-0.02	0.18	0.08	0.54
		StDev	*(0.23)*	*(0.17)*	*(0.29)*	*(0.49)*	*(2.04)*	*(0.42)*	*(0.64)*	*(0.22)*	*(0.14)*	*(0.07)*	*(0.20)*	*(0.17)*	*(0.32)*
Non-issuers	1935	Mean	0.46	-0.10	-0.07	-0.03	1.50	0.10	0.91	0.27	0.08	-0.06	0.18	-0.02	-0.17
		StDev	*(0.27)*	*(0.44)*	*(1.18)*	*(1.24)*	*(1.20)*	*(3.20)*	*(1.21)*	*(0.24)*	*(0.18)*	*(0.17)*	*(0.23)*	*(0.10)*	*(1.28)*
Debt Issuers	1062	Mean	0.63	0.18	-0.06	0.02	1.67	0.08	1.00	0.32	0.06	-0.10	0.11	0.09	0.12
		StDev	*(0.20)*	*(0.14)*	*(0.62)*	*(0.62)*	*(1.27)*	*(0.24)*	*(0.89)*	*(0.24)*	*(0.15)*	*(0.32)*	*(0.16)*	*(0.11)*	*(0.64)*
Equity Issuers	1303	Mean	0.29	-0.16	0.38	-0.33	2.15	-0.16	0.41	0.17	0.08	-0.02	0.22	-0.10	0.22
		StDev	*(0.25)*	*(0.59)*	*(0.51)*	*(0.86)*	*(2.23)*	*(0.43)*	*(0.70)*	*(0.23)*	*(0.17)*	*(0.05)*	*(0.23)*	*(0.16)*	*(0.67)*
IPO Firms															
Dual Issuers	225	Mean	0.42	0.23	0.32	-0.28	2.17	-0.14	0.62	0.21	0.05	-0.03	0.19	0.08	0.55
		StDev	*(0.21)*	*(0.16)*	*(0.34)*	*(0.67)*	*(2.19)*	*(0.49)*	*(0.65)*	*(0.22)*	*(0.15)*	*(0.06)*	*(0.21)*	*(0.15)*	*(0.36)*
Non-issuers	425	Mean	0.36	-0.08	-0.03	-0.15	1.63	-0.01	0.85	0.23	0.05	-0.05	0.24	-0.03	-0.11
		StDev	*(0.26)*	*(0.24)*	*(0.29)*	*(0.55)*	*(1.59)*	*(0.49)*	*(1.07)*	*(0.25)*	*(0.14)*	*(0.16)*	*(0.26)*	*(0.09)*	*(0.47)*
Debt Issuers	243	Mean	0.59	0.19	-0.09	0.02	1.96	0.05	0.94	0.31	0.05	-0.13	0.17	0.11	0.10
		StDev	*(0.23)*	*(0.14)*	*(0.88)*	*(0.87)*	*(2.00)*	*(0.35)*	*(0.88)*	*(0.28)*	*(0.13)*	*(0.61)*	*(0.22)*	*(0.11)*	*(0.89)*
Equity Issuers	332	Mean	0.22	-0.10	0.38	-0.35	2.05	-0.18	0.39	0.18	0.07	-0.02	0.25	-0.10	0.28
		StDev	*(0.22)*	*(0.31)*	*(0.58)*	*(0.83)*	*(2.60)*	*(0.51)*	*(0.70)*	*(0.23)*	*(0.16)*	*(0.07)*	*(0.26)*	*(0.13)*	*(0.64)*
Non - IPO Firms															
Dual Issuers	557	Mean	0.49	0.23	0.30	-0.20	2.31	-0.10	0.41	0.21	0.06	-0.02	0.18	0.08	0.53
		StDev	*(0.23)*	*(0.17)*	*(0.27)*	*(0.39)*	*(1.98)*	*(0.38)*	*(0.63)*	*(0.22)*	*(0.13)*	*(0.07)*	*(0.20)*	*(0.18)*	*(0.30)*
Non-issuers	1510	Mean	0.49	-0.11	-0.08	0.00	1.46	0.13	0.93	0.28	0.09	-0.06	0.16	-0.01	-0.19
		StDev	*(0.26)*	*(0.48)*	*(1.32)*	*(1.37)*	*(1.06)*	*(3.62)*	*(1.25)*	*(0.24)*	*(0.19)*	*(0.17)*	*(0.23)*	*(0.10)*	*(1.43)*
Debt Issuers	819	Mean	0.64	0.18	-0.05	0.02	1.59	0.08	1.01	0.32	0.07	-0.09	0.10	0.09	0.13
		StDev	*(0.20)*	*(0.14)*	*(0.51)*	*(0.52)*	*(0.94)*	*(0.19)*	*(0.89)*	*(0.23)*	*(0.15)*	*(0.15)*	*(0.14)*	*(0.11)*	*(0.54)*
Equity Issuers	971	Mean	0.31	-0.18	0.38	-0.33	2.18	-0.16	0.41	0.17	0.08	-0.01	0.21	-0.11	0.20
		StDev	*(0.26)*	*(0.65)*	*(0.48)*	*(0.86)*	*(2.09)*	*(0.40)*	*(0.71)*	*(0.23)*	*(0.17)*	*(0.05)*	*(0.22)*	*(0.16)*	*(0.69)*