

## Primary equity formation in Australia

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# **PRIMARY EQUITY FORMATION IN AUSTRALIA**

**Li - Anne Elizabeth Woo**

**A dissertation submitted to the University of New South Wales in  
fulfilment of the requirement for the Doctor of Philosophy**

**2000**

## **CERTIFICATION**

*I hereby declare that the submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material to which a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment is made in the text.*

*Li-Anne Elizabeth Woo  
March 16, 2000.*

## **CERTIFICATE OF ORIGINALITY**

I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at UNSW or any other educational institution, except where due acknowledgement is made in the thesis. Any contribution made to the research by others, with whom I have worked at UNSW or elsewhere, is explicitly acknowledged in the thesis.

I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project's design and conception or in style, presentation and linguistic expression is acknowledged.

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## **ABSTRACT**

Primary equity issues provide an injection of funds from the sale of new shares prior to stock exchange listing. Typically, new primary equity is publicly sourced via an initial public offer (IPO). In Australia, however, a direct placement to private and institutional shareholders may also be undertaken prior to flotation.

This dissertation begins with a review of the Australian institutional issuance environment. The empirical analysis uses a sample of 1,351 Australian primary equity raisings that listed between January 1983 and June 1995. In aggregate, these equity raisings totalled A\$30B (in 1997 constant dollars), having an average issue size of A\$24.4M and average flotation costs of 7.88%. Two formation decisions, relating to the demand for underwriter services and choice of distribution method, are investigated. In each study, a theoretical model is developed and tested using logit regression analysis.

In the context of the demand for underwriting services, transaction costs, information asymmetry, risk transfer/avoidance and self-marketing hypotheses from the financial intermediation literature are examined. Empirical results support the transaction costs, liquidity and risk transfer/avoidance hypotheses, but not the information asymmetry explanations.

The choice of primary equity distribution method is analogous to the public versus private funding choice reported in the debt market literature, in which the source of funding is related to transaction costs and information asymmetry hypotheses. This framework is augmented by marketing risk and channel structure considerations, and by corporate governance based research in the IPO literature that suggest the maintenance of private control rights and preferences for a particular initial ownership structure, motivate distribution choice. Support for transaction costs and marketing risk explanations is identified in a reduced form model. Moreover, corporate governance considerations are found to be important for small equity raisings.



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Li-Anne Woo, Sydney, Australia

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# CHAPTER 1

## INTRODUCTION

Primary equity issues are characterised by the absence of a market based valuation prior to stock exchange listing, are subject to greater information asymmetries, and prove more difficult to market and distribute than seasoned equity issues<sup>1</sup>. Consequently, a potential role for financial intermediation exists as firms seek subscriptions to new shares in exchange for investment funds and working capital to support their operations.

When making a primary equity issue prior to listing, the firm is often confronted with several interrelated decisions which are made in an uncertain issue environment. These critical decisions include: (i) the adoption of agents, such as underwriters, auditors and lawyers, to assist in the issue and flotation; (ii) the source of primary equity and its implications for distribution method; (iii) the pricing and allocation mechanism for the sale of shares<sup>2</sup>; and (iv) when shares will commence to trade.

The main objective of this dissertation is to investigate two of these 'primary issue cum listing' decisions, the underwriting decision and the choice of distribution method. A survey of the literature indicates that little is known of the determinants of these decisions

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<sup>1</sup> A seasoned offer is made by a publicly listed firm to existing shareholders to extend the equity base of the firm. The offer price is usually stated in terms of a fixed percentage discount from the share price at a given point in time and historical financial and share price information is publicly available.

<sup>2</sup> Research examining pricing mechanisms compare auctions, fixed price offers and bookbuilding allocation mechanisms, however this line of research is not particularly relevant to the Australian primary equity market which is dominated by the fixed pricing mechanism.



in equity markets. Further, there is an absence of theoretical frameworks for these decisions in the context of primary equity raisings, despite considerable development of such frameworks in the debt market literature explaining *financial intermediation* [see Black (1975), Benston & Smith (1976), Campbell & Kracaw (1980), Diamond (1984, 1991), James (1987) and Berlin & Loeys (1988)] and *the choice of debt type* [see Blackwell & Kidwell (1988), Esho, Lam & Sharpe (1999) and Krishnaswami, Spindt & Subrahmanyam (1999)].

In this dissertation, a theoretical framework is developed for the underwriting and distribution method decisions and these models are applied to Australian data. To achieve this end, a unified and cross-disciplinary perspective is formulated that draws upon several streams of thought. They include the new issues and corporate governance literatures that examine optimal ownership structure, control rights, and securities design, theories associated with financial intermediation and the public versus private funding choice in the debt market literature, and aspects of power, intermediation and marketing risk in the distribution channel literature. Empirical tests of these models are implemented on a sample of 1,351 publicly traded Australian firms that issue primary equity prior to stock exchange listing (that is, where both events occur within a relatively short period of time). Consequently, a database of Australian primary equity issues, including both initial public offers (IPOs) and direct placements, was compiled for the period January 1983 to June 1995.

## 1.1 Limitations of Existing Research

There are many aspects of the primary equity market that we do not understand. While the decision to raise primary equity is related to the capital structure literature, traditional theories of capital structure typically focus on the selection of an optimal combination of debt and equity capital [see Modigliani & Miller (1958)] without regard for how the equity or debt capital should be raised. Thus, the possibility of different types of equity or debt capital is conveniently disregarded. This deficiency has been overcome in the debt market literature which specifically examines different sources of debt funding [see Krishnaswami, Spindt & Subrahmanyam (1999)]. However, there has been little consideration of different sources of primary equity.

A comprehensive view of the issuing process for primary equity is difficult to synthesise as individual theories appear fragmented and disconnected. For example, as both the empirical and theoretical literature has concentrated on the underpricing or long-term under-performance phenomenon, there has been little attention given to other issue / flotation decisions. A large number of empirical studies report substantial and systematic evidence of persistent underpricing and long-term under-performance of IPOs [see Ritter (1991)] over different time frames and institutional frameworks [see Chapter 2, Table 2.1]. Consequently, the focus of much of the theoretical research in primary equity raising has been related to the development of potential explanations of the IPO underpricing phenomenon using a variety of approaches such as *signalling models* [see Downes & Heinkel (1982), Allen & Faulhaber (1989), Grinblatt & Huang (1989), Krinsky & Rotenberg (1989), Welch (1989)], *the explicit modelling of information asymmetries* [see Baron (1982) and Rock (1986)], and *prospect theory* [see Loughran & Ritter (2000)].

Other aspects of primary equity raising have been studied, including different pricing arrangements such as *auction, fixed price and bookbuilding mechanisms* [see McDonald & Jacquillat (1974), Jacquillat, McDonald & Rolfo (1978), Koh & Walter (1987), Mao (1990), Leleux & Paliard (1996), Benveniste & Busaba (1997), Kandel, Sarig & Wohl (1997) and Derrien & Womack (1999)], *the choice of best efforts versus firm commitment underwriting contracts* [see Mandelker & Raviv (1977), Baron (1979, 1982), Baron & Holmstrom (1980), Ritter (1985), Bachar (1988), Bower (1989) Welch (1991) and Sherman (1992)], *the use of over allocation options* [see Hansen, Fuller & Janjigian (1987), Hanley & Wilhelm (1993) and Carter & Dark (1990)], and *the influence of venture capitalists in staged financing* [see Barry, Muscarella, Peavy & Vetsuypens (1990), Brav & Gompers (1993) and Packer (1994)]. Yet, these particular aspects have not been empirically tested using Australian data.

Studies which have examined aspects other than underpricing and long-run under-performance have generally analysed a single decision within the primary equity process. Consequently, these studies have assumed that the decision examined is independent of other decisions within the primary equity process. This restrictive assumption has been identified as a deficiency by several recent studies investigating the primary equity formation process. In particular, these studies recognise that future research should have a broader base and focus upon multiple decisions and their interrelatedness. Thus, it is argued by Leleux & Paliard (1996, p50-51) that an integrated approach is required to advance our current understanding of the workings of the primary equity market which involves “a number of decisions and procedures, the interaction of which is not fully understood”. Similarly, Logue, Rogalski, Seward & Foster-Johnson (1999, abstract and p3)

suggest that because the issue environment is complex, interactions between the various influences need to be accounted for simultaneously in model development “if proper inferences about the IPO process and investor returns are to be drawn”. As a consequence, the activities of the investment bank are modelled as “sequential, integrated elements of an underwriting process rather than a series of unrelated isolated decisions”.

A further limitation of the existing research is that the predominant theoretical frameworks are based on U.S. institutional features, which are unlikely to be relevant for alternative institutional environments, such as the primary equity formation process in Australia. Specific country factors and characteristics of the stock market are expected to affect issue and flotation decisions and their outcomes [see Leleux & Paliard (1996)]. Indeed, the significant institutional differences between the Australian and U.S. primary equity markets provides us with a unique opportunity to study underwriter and distribution choice decisions in Australia. This is because virtually all primary issues in the U.S. are underwritten, so an analysis of both underwritten and non-underwritten issues cannot be undertaken. However, in Australia some variation in underwriter adoption is observed, as approximately 20% of the issues are not underwritten, making a study of the underwriting choice feasible. Further, there are strict rules governing the definition of private and public issues in the U.S. Only public issues can be publicly traded, and ‘private placements’ under SEC Rule 144 must remain in private hands and cannot be publicly traded. This clear cut definition in U.S. regulation not only determines the source of equity capital, but its trading behaviour. In contrast, a primary issue of shares in Australia is typically accompanied by stock exchange listing [see Finn & Higram (1988)], so that influences other than the benefits of stock exchange listing or ‘going-public’ must be considered in the Australian

environment.

The analysis of the choice of distribution method in Australia requires a coherent theoretical framework that fully reflects the local institutional setting. While such a framework does not currently exist in the literature, related work in the U.S. considers an issuing firm's preference for an initial ownership structure, consisting of a relative mix of institutional and public shareholders, within the structure of an IPO [see Zingales (1995), Ellingsen & Rydqvist (1997), Mello & Parsons (1998), Stoughton & Zechner (1998) and Maksimovic & Pichler (1999)]. While these models are deficient in portraying the direct placement versus IPO choice that exists in the Australian primary equity market, these theories can be adapted for a study of distribution choice. This is because the selection of the direct placement mechanism reflects the issuing firm's desire to target institutional and private shareholders. Consequently, the direct placement mechanism can be viewed as an extreme characterisation of the mechanism modelled in the U.S. literature.

Moreover, the existing literature examining primary equity issues in Australia is largely confined to the study of initial public offers. There is an extensive literature on both *underpricing* [see Chapter 2, Table 2.2] and *long run performance of primary offers* [see Mustow (1992), Stewart (1992), Breeden & How (1993), Harris & Suchard (1995) Lee, Taylor & Walter (1994) and How (1995)]. Some studies have considered subsidiary concerns such as the *determinants of underwriter spreads* [see McDonald (1992) and How & Yeo (1999)], *differential voting rights* [see Taylor & Whittred (1993)], and *Australian government privatisations* [see Walker & Howard (1992), Easton & Pinder (1996, 1997), Walker (1997) and Suchard & Lee (1999)]. However, the underwriting decision and the

choice of distribution method are two aspects of primary equity issue and flotation that have not been examined in Australia.

## 1.2 Objectives and Contributions of the Dissertation

In view of the limitations outlined above, the main objective of this dissertation is to enhance our understanding of several decisions relating to primary equity raising and stock exchange listing. This objective is achieved through the following research aims:

- *to document the process by which primary equity is raised in Australia (Chapters 2 & 3);*
- *to compile a database of primary equity offers in Australia capable of examining the distribution method and underwriting choice decisions (Chapter 3);*
- *to empirically examine the factors influencing the demand for underwriting services when issuing primary equity (Chapter 4); and*
- *to empirically examine determinants of the choice of primary equity distribution method, namely an initial public offer (IPO) or a direct placement (Chapter 5).*

The dissertation makes a number of important contributions to our understanding of the primary equity formation process. The primary equity formation process in Australia is documented in Chapter 2, which reviews the various methods of raising and distributing equity that are commonly available to firms in Australia. An overview is provided of the value of funds raised, the characteristics of the firms and industries underlying its formation, and the role of the participants. In particular, the institutional and legal framework that characterises the Australian equity market is examined. Recent trends in primary equity formation are summarised, and an account provided of the chronological steps involved in the equity formation process for a typical primary issue.

A description of the database compiled in this dissertation is then provided in Chapter 3. The sample consists of 1,351 primary equity issues and spans a longer time period, January 1983 - June 1995, than any presently published research. It involved the collection of source documents, the design of a data capture system, and the coding of information in a meaningful way. Data in relation to primary issues does not exist commercially in electronic form in Australia, whereas this type of data is commonly available for offers in the United States (U.S.) [refer to *Compustat (S&P Research Insight)* and *Securities Data Inc. (New Issues Database)*]. The scope of the database includes both initial public offers and direct placements, and includes both the industrial and resource-based sectors. The inclusion of direct placements facilitates a comparison of distribution methods, and extends existing Australian research that focusses solely upon initial public offers<sup>3</sup>.

Chapter 3 also provides an overview of primary equity formation in Australia in the form of an historical account of the gross proceeds of the sample of primary equity issues. To facilitate international comparisons, the level of underpricing, the direct costs of going public, and a summary review of participants involved in the issuance process is presented. This research also 'breaks new ground' by deriving benchmark reputation rankings for Australian underwriters. While this type of information is commonly available for U.S. investment banks and underwriters, it was not available for Australian entities.

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<sup>3</sup> The sample is also extended to include all initial public offers, including those with an offer price less than \$1. Most of the research on IPOs has focussed on underpricing aspects and hence, issues with offer prices under \$1 are excluded. This criterion means that more than 70% of the population of IPOs is typically excluded from the analysis.

Chapter 4 then examines the factors influencing the demand for underwriting services in Australia. Underwriting can be regarded as a form of financial intermediation in primary equity markets, bringing together firms in need of equity capital and the suppliers of equity funds. A theoretical model is developed for the demand for underwriting services that draws on explanations of financial intermediation in the debt markets including transaction costs, information asymmetry, firm reputation effects, liquidity and risk transfer/avoidance hypotheses. The model is tested using logit regression analysis on a sample of 906 primary equity issues in Australia for which complete data is available. The results are consistent with the transaction cost, liquidity and risk transfer/avoidance hypotheses proposed in the financial intermediation literature, but only weakly support the information asymmetry hypothesis.

The factors influencing the choice of distribution method are then examined in Chapter 5. In Australia, primary issues prior to stock exchange listing may be made by either an initial public offer or a direct placement. The source of equity funds differs across the distribution mechanisms with the former raising funds from the general public, and the latter from private and institutional investors. However, unlike private placements in the United States [see Ellingsen & Rydqvist (1997)], direct placements can be publicly traded provided that stock exchange listing requirements are met. Recognition of shareholder heterogeneity is essential if one is to characterise primary equity issues in a realistic manner. Such differences arise as a direct result of information asymmetries, and different capacities and incentives to monitor, and stakeholder size. These characteristics also have a bearing on agency relationships and the way in which the firm is governed [see Hill & Jones (1992)].



Thus, Chapter 5 begins with a discussion of the theoretical framework used to analyse the choice of distribution method. This model of distribution choice is formulated from a diverse literature encompassing corporate governance, transaction costs, information asymmetry and marketing/distribution explanations, and is empirically tested using logit regression analysis on a subset of 837 primary equity issues. Generally, the results provide support for the marketing risk and transaction costs hypotheses but provide little support for the information asymmetry hypothesis. Moreover, corporate governance motivations are only found to be important for small equity raisings.

## **CHAPTER 2**

### **RAISING EQUITY**

#### **2.1 Introduction**

Before considering the specific research issues posed in this dissertation, a review of the legislative and institutional issues that influence primary equity raising and equity markets in general, and the process by which equity capital is formed in Australia, is provided. Often, it is the understanding of these unique market features that sheds light on international differences in empirical anomalies. Moreover, it provides the reader with a foundation upon which the analyses in Chapters 4 and 5 rest. Section 2.2 describes the nature of 'equity' capital and the methods of raising primary equity. Next, in Section 2.3, the sequence of activities and decisions involved in raising equity is examined. A time line for issuing primary equity is reviewed in Section 2.4, while Section 2.5 concludes.

#### **2.2 Equity Capital**

Equity capital is one of the sources of funds available to the firm. It represents funds contributed by owners or shareholders of the firm [refer to Hoggett & Edwards (1987), Chapter 16]. Equity can be categorised according to the time it was issued and its source. For example, a primary offer refers to the inaugural issue of equity, and is also known as an unseasoned or initial issue. It is the usual practice in Australia for firms to raise primary funds with the intention of subsequently listing on the stock exchange. This means that for initial primary issues neither a market determined valuation nor an historical share price series is available prior to the listing of shares on the stock exchange. This situation is referred to as the 'issue-cum-listing process'. While a primary issue usually

coincides with listing, in the U.S. it is possible for firms to trade in the over-the-counter markets before listing on larger stock exchanges like the American Stock Exchange or the New York Stock Exchange [see Finn & Higram (1988)].

In the case of secondary offers<sup>1</sup> made by public corporations, a new issue of shares is made to existing shareholders. As previously issued shares are traded on the stock market prior to the secondary offer, historical share prices are known. With the focus of this dissertation on the formation of primary equity in Australia, further reference to secondary offerings is unwarranted.

### **2.2.1 Sources of Primary Equity Capital**

Primary equity can be derived from public or private sources, and this distinction provides a useful taxonomy for the remainder of the discussion. The source of equity funding has implications for both the disclosure requirements imposed on the issuing firm by regulators<sup>2</sup> and the role different shareholder constituencies play in monitoring the firm's management and activities. The latter arise as a consequence of the initial allocation of shares in the private versus public issue process. Consequently, an issuing firm's choice of optimal flotation mechanism in the cum-listing process has significant implications for the source of its equity capital [see Leleux & Paliard (1996, p50-51)].

There are several methods for distributing primary equity. A taxonomy of U.S.

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<sup>1</sup> Also referred to as seasoned or rights issues.

<sup>2</sup> The Australian Corporations Law aims to provide adequate information for investors to make an informed decision. In the case of private companies, the provision of information is by way of private negotiation.

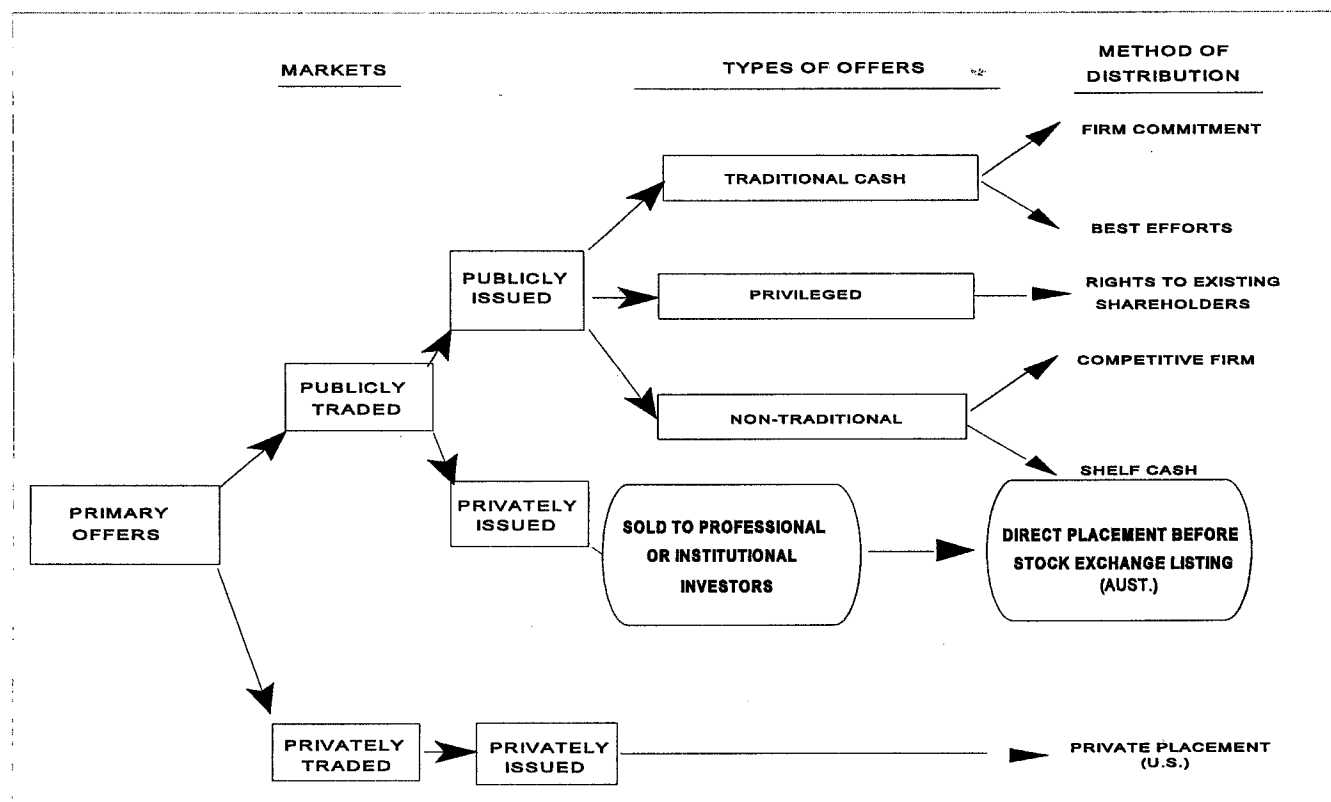
methods appears in Figure 2.1. This figure, based on Ross, Westerfield and Jaffe (1991) has been amended to also reflect the direct placement mechanism used in Australia. The direct placement method of distribution is best categorised separately, reflecting the fact that it is publicly traded and targets specific institutional and private shareholders. The Ross, Westerfield and Jaffe (1991) taxonomy distinguishes U.S. offering methods according to whether they are exchange-listed (ie publicly traded) or privately held. There are three types of publicly traded offers, traditional offers (also known as initial public offers (IPOs)), privileged offers and non-traditional offers. The main distinction between these types of offers depends on how the offer is distributed to subscribers [see Sections 2.2.1(a)(i) to 2.2.1(a)(iii)].

In the United States, rules specifically prohibit the public trading of shares that were issued through a private issue [see SEC Rule 144]. That is privately issued equity must remain in the hands of private investors and cannot be sold on a stock exchange. Consequently, U.S. studies of optimal security issuance that examine differences between IPOs and private placements, have generally concentrated on the relative merits of exchange listing<sup>3</sup> [see Ellingsen & Rydqvist (1997)]. However, in Australia, the United Kingdom and France it is possible for firms to place shares privately, and subject to satisfying further listing requirements concerning spread of shareholding, profitability, and capitalisation, seek stock exchange listing and begin to trade shares [see Jenkinson & Mayer (1988), Leleux & Paliard (1996) and Brennan & Franks (1997)].

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<sup>3</sup> The relevance of this literature is discussed further in Chapter 5 where the determinants of distribution choice are analysed.

**Figure 2.1**  
**Methods of Distributing Primary Equity**



Source: Ross, Westerfield & Jaffe (1991, p516) with amendment.

As both the direct placement and IPO distribution methods in Australia result in secondary market trading, a key difference between these distribution mechanisms relates to the source of the equity funding and the potential influence different subscriber types may exert over the firm. Variations in corporate monitoring and control, brought about by different sized ownership stakes and incentives to monitor by heterogeneous shareholders, significantly influence the corporate governance setting in which the firm operates [see Weston, Chung & Siu (1990) and Hill & Jones (1992)].

While it is often convenient to assume that shareholders are homogeneous with uniform preferences, investment time horizons and expectations [see Harrington (1983)], the corporate governance framework encourages us to characterise different types of shareholders [see Ikäheimo (1996)]. Shareholders may be private or institutional, active or passive, diffuse or concentrated, large or small, diversified or undiversified, sophisticated or unsophisticated. Consequently, goals, motivations, preferences and preferred information sets<sup>4</sup> are expected to vary across shareholders<sup>5</sup>. Because one shareholder is not a perfect substitute for another, managers of issuing firms, representing the founding shareholders, may have distinct preferences for certain shareholder characteristics<sup>6</sup>. In seeking public listing, existing shareholders must evaluate to what extent they are willing to give up private control rights.

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<sup>4</sup> See Lee & Tweedie (1981) in relation to the use and generation of differential information by sophisticated investors.

<sup>5</sup> Shareholder heterogeneity has long been recognised in the finance literature. For example, differential incentives to monitor [see Demsetz & Lehn (1985), Shleifer & Vishny (1986) and Holderness & Sheehan (1988)], costs of transacting [see Easley & O'Hara (1987), Lin, Sanger & Booth (1995)] and dividend payout preferences [see Elton & Gruber (1970) and Shefrin & Statman (1984)].

<sup>6</sup> In Chapter 5, further discussion is provided about the alignment of different types of shareholders' interests to the primary issuance process.

Another distinction between the distribution mechanisms concerns differential information disclosure requirements which prevailed in Australia until July 1998 [see Section 2.2.1(b) for further details]. While a private offer was not subject to the same stringent regulations as a public offer over the sample period of this study, recent changes to the Corporations Legislation and ASX Listing Rules have muted this distinction.

The remaining discussion in this section examines the main methods of distribution commonly available in both Australia and the U.S. In the sample of new listings analysed in subsequent chapters, it is possible to classify them according to whether they are initial public offers or direct placements. Further sub-classification is however difficult to achieve due to inconsistencies in reporting over the sample period.

### **2.2.1(a) Public Equity Raisings**

Presently, offers to the public are required to issue a prospectus or selling document under Australian Corporations Law (ACL)<sup>7</sup>. This prospectus must be registered with the Australian Securities Commission (ASC) prior to marketing the float<sup>8</sup>. The legislative requirements governing prospectuses do not precisely specify the type or form of financial information to be disclosed in the issue document [see Gordon (1992, p11)]. The only statement concerning the provision of financial information in the prospectus being that a prospectus contain:

***“all such information as investors and their professional advisers would reasonably require, and reasonably expect to find in the prospectus, for the purpose of making an informed assessment of:***

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<sup>7</sup> ACL Section 1030(1). The cost of prospectus registration in 1998 is \$1,730.

<sup>8</sup> Under ACL, Sections 1018 and 1020A.

(a) *the assets and liabilities, financial position, profits and losses, and prospects of the corporation ...*<sup>9</sup>

Moreover, primary responsibility for the disclosure of this reasonable information is imparted to ‘any person who authorised or caused the issue of the prospectus’, under Section 1022(2), which includes<sup>10</sup> corporate directors, promoters, experts, stockbrokers or underwriters, auditors, solicitors and bankers or other professional or advisor performing functions related to the proposed issue of shares.

If the shares are to be listed, an approach is made to the Australian Stock Exchange (ASX) for admission to the official list. The firm is then also subject to further regulatory requirements as specified in the stock exchange listing rules concerning adequate capitalisation, spread of shareholders, and disclosures<sup>11</sup>. From June 1991, amendments to the listing rules also insisted that the equity market be fully informed prior to the start of trading through pre-quotation disclosure<sup>12</sup>.

The need to issue a prospectus for public equity fundraising has been seen as a major stumbling block for equity formation in Australia<sup>13</sup>. Various arguments supporting this view have been presented including the costs of compliance, relative costs of disclosure for large versus small firms, and speed of issue [see Campbell Committee Report (1981),

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<sup>9</sup> Under ACL Section 1022(a).

<sup>10</sup> See ACL Sections 1066(b)-(h).

<sup>11</sup> Under Australian Stock Exchange Official Listing Rules (Main Board) Section 2B.

<sup>12</sup> Australian Stock Exchange Limited News Release dated May 24, 1991.

<sup>13</sup> See Department of Treasury (1998), Corporate Law Economic Reform Package: Commentary on the Draft Provisions, p15, Paragraph 44.



the Industry Commission Report on the Availability of Capital (1991) and Department of Treasury Draft Legislative Provisions for the Corporate Law Economic Reform Package (1998)]. The possibility of reduced disclosure standards for some smaller issues<sup>14</sup> through the release of an offer information statement is one of the significant changes to the Corporations Law on Fundraising proposed in the Corporate Law Economic Reform Package (CLERP) announced in April 1998, effective from March 2000<sup>15</sup>. This need for reform is endorsed by the ASX [refer to Roche (1997, p60)] on the basis that investment is stifled because of the “sheer complexity and cost of prospectuses”. Roche also believes that “prospectuses have tended to become convoluted and incomprehensible documents” and cites another article by Macmillan (1996) which concludes that “most prospectuses did not contain readily accessible (if any) information on costs and other basic information about capital raising”.

The term ‘public equity offer’, while not formally defined by Australian corporate legislation<sup>16</sup>, is generally understood to be an invitation to the public at large to subscribe for shares in a corporation in exchange for cash consideration. The lack of formal definition arises due to a difficulty in clearly defining the concept ‘public’. In 1971, the Eggleston Committee proposed that ‘public’ refer to a distribution of securities to more than

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<sup>14</sup> These exclusions are similar to the unregistered offering provisions that exist in the U.S. under Rule 504 of Regulation D for small placements.

<sup>15</sup> More specifically, the draft legislative changes result in a substantial softening of the present legislation by allowing issuers to raise up to \$2 million each year from up to 20 persons without issuing a prospectus and allowing issuers to raise up to \$5 million under an offer information statement rather than a full prospectus, which alleviates the issuer from undertaking due diligence investigations required for prospectuses. The logic in the reforms is that “draft provisions are designed to minimise the costs of fundraising while maintaining investor protection.”

<sup>16</sup> The relevant section that refers to an offer to the public is ACL Section 82.

50 individuals<sup>17</sup>. As this definition relies on a specific number of investors, it was easily manipulated by firms wishing to avoid the more onerous disclosure requirements governing public issues<sup>18</sup>. Legislative deficiencies as well as general confusion as to what actually constitutes a public offer, lead the High Court to rule in CAC v Australian Central Credit Union (1985) 3 ACLC 792 that the nature, content and general circumstances of the offer be considered on a case by case basis. The response from the judges is summarised by the following passage<sup>19</sup>:

*" The question of whether a particular group of persons constitutes a section of the public for the purposes of s5(4) ... cannot be answered in abstract. For some purposes and in some circumstances, each citizen is a member of the public and any group of persons can constitute a section of the public. For other purposes and in other circumstances, the same person or the same group can be seen as identified by some characteristic which isolates him or them in a private capacity and places him or them in a position of contrast with a member or section of the public. In a case where an offer is made by a stranger and there is no rational connection between the characteristic which sets the members of a group apart and the nature of the offer made to them, the group will, at least ordinarily, constitute a section of the public for the purposes of the offer. If, however, there is some subsisting special relationship between the offerer and members of the group or some rational connection between the common characteristic of members in the group and the offer made to them, the question of whether the group constitutes a section of the public for the offer will fall to be determined by reference to a variety of factors of which the most important would ordinarily be: the number of persons comprising the group, the subsisting relationship between the offerer and members of the group, the nature and content of the offer, the significance of any particular characteristic which identifies the members of the group and any connection between that characteristic and the offer".*

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<sup>17</sup> Refer to the ASC Policy Discussion Paper Corporations Act (1989), Fundraising by Companies : Operation of Prospectus Provisions under Division 2 of Part 7.12 dated June 20, 1990, paragraphs 4.1 - 4.3 and the Company Law Committee to the Standing Committee of Attorneys-General (the Eggleston Committee) - Fifth Interim Report : On the Control of Fundraising, Share Capital and Debentures (May 1971).

<sup>18</sup> In the U.S., a firm with more than 500 shareholders is required to file disclosure documents as if it were publicly traded.

<sup>19</sup> Hambrook & Farrar (1991, Para. 7.40230, 74,229).

Based on this ruling, it appears that the definition of the 'public' is important as issuing firms owe the public a duty of care to independent parties to whom no special or privileged connection exists. This implies that some weight of the law exists in the interests of public protection [see Gordon (1992)].

Public offers can be classified according to whether they are traditional, privileged or non-traditional. These classifications describe certain key and often overlapping characteristics of offering types. The traditional form distinguishes issues according to the type of underwriting contract used. The privileged form focuses upon whether or not sophisticated investors are targetted in the distribution, while the non-traditional form is used to describe aspects of the issue.

#### **2.2.1(a)(i) Traditional Public Offers**

It is generally accepted that most offers are underwritten. In traditional offers, conditions relating to the sale of shares are negotiated between the firm and the underwriter. Both the 'firm commitment' and 'best effort' form of underwriting contract are examples of traditional public offers.

In a firm commitment contract, the role of the agent, acting as a promoter, is to advise, price, distribute and underwrite the issue. The success of this type of issue is largely dependent on the pricing and distribution efforts of the promoter, as well as the efficiency and scope of the distribution channel<sup>20</sup>. The firm commitment contract guarantees the total net proceeds of the issue. Consequently, the risk associated with marketing and distributing the issue is transferred to the promoter. Moreover, under a firm commitment contract the

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<sup>20</sup> A distribution channel is the structure which links firms that supply goods and services to the end users that demand them [see Dixon & Wilkinson (1982, p15)].

underwriter can on-sell or make up for any shortfall in the expected demand for the issue. The selling and distribution risk is thereby assumed by the promoter at the contracted price. In Australia, this type of contract is often referred to as a stand-by agreement [see Finn & Higram (1988, p7) and How, Izan & Munroe (1991, p101)]<sup>21</sup>. However, there is a subtle difference between U.S. firm commitment contracts and Australian stand-by agreements. Under a stand-by agreement the underwriter must raise the shortfall and there are no specific provisions for on-selling. Alexander (1993, p68, footnote 190) indicates that 95% of all U.S. IPO underwriting contracts are firm commitment.

The alternative form of contract, known as best efforts (or best endeavours in Australia), requires the promoter to undertake less services than in a firm commitment contract. Under this form of contract, the role of the promoter is limited to advising and pricing the issue, and distributing the shares. The promoter agrees under best efforts to sell as many shares as possible at the negotiated offer price. As no express guarantee is provided by the promoter concerning full subscription, the promoter is not exposed to the risk of the issue. Benveniste & Spindt (1989b, p1) regard this as a 'consignment' sale. In exchange for their services, promoters receive a fixed pre-determined fee (underwriter spread), expressed on a per share sold basis, conditional upon a pre-specified minimum being sold. Failure to attract full subscription over a pre-specified period (usually 3-6 months in Australia) results in the withdrawal of the offer and by law any money collected from prospective subscribers is refunded under ACL Sections 1035 and 1036. This means that zero funds are raised by the firm. Moreover, the firm must pay out of pocket expenses and fees related to non-completion as specified in the contract.

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<sup>21</sup> In the U.S., a standby agreement refers to a specific type of underwriting agreement which pays a guaranteed sum plus some proportional share of the proceeds above an agreed value to the underwriter. Refer to Bachar (1988, p436) for more details.

Best effort contracts are typically adopted by relatively small, speculative issues in the U.S. [see Ritter (1987, Table 1)] and are not as popular as firm commitment contracts [see Ritter (1987)<sup>22</sup>, Benveniste & Spindt (1989, p267), Hanley & Ritter (1992, pp 2-3) and Dunbar (1998) for usage in the U.S.]<sup>23</sup>. Further, Loughran, Ritter & Rydqvist (1994) indicate that the main difference between firm commitment and best effort contracts is that, in the former, the offer price is set after acquiring information about the level of expected demand for the offer.

### **2.2.1(a)(ii) Privileged Public Offers**

Prior to 1995, privileged offers were not common in Australia. In a privileged offer, the offer is reserved, in part or completely, for potential shareholders in the public domain provided they satisfy some additional criteria such as being a frequent customer of the firm, an already existing shareholder in a private company which floats, or an employee of the firm. This classification of a 'privileged' public offer lends itself to being a hybrid offering in the sense of there being some overlap between this category and direct placements [defined in Section 2.2.1(b)] because of the closer degree of association between the firm and its intended shareholder group. The use of this type of offering in Australia is the direct result of the adoption of a mixed strategy of offering shares simultaneously to members of the public, existing shareholders, employees and institutions, particularly in government privatisations, demutualisations and large syndicated offerings. We shall refer to these mixed offerings as 'tiered', as quite often the offer to the privileged group is made on

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<sup>22</sup> Ritter (1987, p271) reports that firm commitment offers are used 64.6% in a sample of 1,028 IPOs listing from 1977-1982 and account for 87.2% of the total proceeds raised. However, best offers accounts for 175 (or 72%) of the 243 offers with gross proceeds less than US\$2M. In Table 3, firm commitment offers pay a underwriting commission of 8.67% compared with best effort offers of 10.26%, and for each size band reported, firm commitment fees are higher than best efforts.

<sup>23</sup> There is no cited evidence available for Australian adoption.

different terms. For illustrative purposes, an example of the offer conditions for a tiered offer appears in Appendix I. Typically, it is common for different offer prices to exist for different classes of shareholders. For instance, the offer price may be determined by competitive tender amongst institutions whereas a fixed price offering is made to the public<sup>24</sup>. In addition, a privileged offering may not be subject to the same 'scale-back' allotment rules as the public offer. What distinguishes tiered offerings is that a public offer is generally made in conjunction with the privileged offer with a further requirement to reserve a portion of the issue to subscribers other than the public at large. Further, the disclosure requirements adopted must also satisfy the public offer conditions. The tiered system appears to have evolved as a consequence of the introduction of book-building in Australia in 1993. Telephone interviews with a number of investment bankers involved in the underwriting of Australian floats suggests that reservations of blocks of stock by supportive clients acts as a sweetener for the sale of the remaining script and reduces overall underwriting risk. In return for pledges of support, institutional investors desire a combination of outcomes that include establishing a holding in high profile stock that is commensurate with the stock's weighting in the All Ordinaries index, being associated with private invitations to subscribe for shares, having the ability to affect the offer price, and ensuring that participation rights to other security offerings is maintained.

### **2.2.1(a)(iii) Non-traditional Public Offers**

Non-traditional public offers are offerings which do not fall into the traditional or privileged offer categories, and include both the competitive-firm cash and the shelf-cash offer forms. Electronic offerings may also be considered as non-traditional as they do not

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<sup>24</sup> For further details in privatisations and demutualisations in Australia refer to Section 2.3.6.

follow a traditional mode of disclosure.

In a competitive-firm cash offer, the promoter is selected through a competitive tender process rather than by negotiation. Bhagat & Frost (1986) argue that issue costs of a competitive offering are lower than that of a negotiated offering. However, very few issuers apart from utilities use competitive offerings<sup>25</sup>. The shelf-cash offer was, until recently, rarely used in the U.S. and not used in Australia. Under Securities and Exchange Commission (SEC) Rule 415, the issuing firm gains approval to cumulatively sell a fixed number of shares over a two year period, without the specific requirement for an underwriter or a prospectus [see Ross, Westerfield & Jaffe (1991, p516)]. One could consider them to be 'direct' public offerings as they are essentially a self-underwritten best-efforts offering sold to institutional investors.

There may also be more opportunities for this type of offering in the future with the increasing use of internet advertising to sell new issues [see Fisch (1998) and Lyneham (1998)]<sup>26</sup>. In the past, issues sold direct to the public were likely to be quite expensive as the issuing firm had to create a mailing list of potential subscribers and incur printing and mailing costs which were directly proportional to the number of potential subscribers. With the internet, the potential to distribute to a much wider audience at little marginal cost is a real cost saving to issuers, all other things equal. The impact of the cost reduction on

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<sup>25</sup> It is argued that competitive firm cash offers result in issues being priced closer to the equilibrium value of the firm, since these offerings appear to be less underpriced.

<sup>26</sup> While the use of the internet for fundraising is yet to be formalised in Australia, in the U.S. from October 1995 the SEC approved the use of the internet as a satisfying means for the "delivery or transmission requirements of the federal securities laws if such distribution resulted in the delivery to the intended recipients of substantially equivalent information as if the required information was delivered in paper form" [refer to Fisch (1998, p23) footnote 57 for details on the exact pronouncements]. The first internet offering by the Spring Street Brewing Company occurred in the U.S. in February 1995, when this firm released Regulation A documentation electronically.

investment bank margins is particularly significant<sup>27</sup>.

### **2.2.1(b) Private Equity Capital Raisings**

A direct placement is an alternative to an initial public offer in the Australian context. Direct placements are distinguished from public offers as they are marketed to select groups of investors on an invitation only basis. Typically these groups include institutional and professional investors such as fund managers, investment advisers, specific clients associated with the promoters of the issue, employees of the firm, and/or existing shareholders<sup>28</sup>. In Australia and other countries such as the United Kingdom and France [see Jenkinson & Mayer (1988, p483) and Leleux & Paliard (1996, p51)], direct placements may occur prior to stock exchange listing. This distinction constitutes a major difference between flotation mechanisms in these countries, relative to private placements in the U.S. Private offers are particularly popular with firms that already have a reasonable spread of shareholdings, but fail to meet the minimum number of shareholders required by the ASX for listing purposes.

Private placements in the U.S., while sharing a common characteristic of being marketed directly to institutional and professional investors, remain closely and privately held. Fenn & Liang (1995, p21) cite a number of advantages with private placements.

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<sup>27</sup> There is a genuine fear on Wall Street that the popularity of recently established internet-based investment banks threatens to reduce the profitability of blue-chip full-service broker practices as most of the cost savings are passed onto the consumer in the form of lower transaction costs. Tully (1999, p112) gives an indication of the cost reduction. In June 1999, Merrill Lynch entered internet based trading offering customers trading on a typical buy order valued at USD\$10,000 for USD\$29.95 which is substantially less than the \$250 full-service, full-commission brokerage. His article in *Fortune* which appeared on August 2 suggests that this change in technology will dramatically alter investment banking.

<sup>28</sup> In recent times, the dichotomy between public and private has been clouded somewhat with the introduction of tiered offerings. The specific nature of such issues is discussed in greater detail in the following section.



First, costs of raising equity may be greatly reduced for small private issues. Second, private placements afford limited disclosure requirements which permit planned and confidential corporate activities to be retained by the firm without the need to publicly disseminate confidential information. Third, a private placement is often faster to complete and involves less legal restrictions and paperwork. Fourth, public shareholders may be less likely to support businesses with complex business arrangements, whereas private investors are less concerned with such issues. Fifth, issuers may flock to private markets as a result of temporary interruptions to the public markets.

The distinction between public and private sources of equity funding clearly delineates the ambit of legislative requirements concerning secondary trading in securities in the U.S. However, similar distinctions are not drawn under Australian company law. The purpose of the SEC's Rule 144 is to protect against fraud in security issuance and to ensure that adequate disclosure exists for issues involving the public. Specifically, it precludes the creation of a market where adequate current information is not available to the public [see SEC Form 144 available at [www.sec.gov](http://www.sec.gov)]. A non-public offering exception from SEC registration requirements hinges on whether 'particular classes of persons affected need protection of the Act' [see *SEC v Ralston Purina Co.*, 346 U.S., 119, 124, 125 (1953)] but at the same time places a restriction on secondary trading of the security by the institutional shareholder at a later date. This is because :

*"... persons acting in this capacity, whether or not engaged in the securities business, are deemed to be 'underwriters' within the meaning of section 2(11) of the Act. If the purchases do in fact acquire the securities with a view to public distribution, the seller assumes the risk of possible violation of the registration requirements of the Act and consequent civil liabilities"(U.S. Securities and Exchange Commission Release 33-4552, November 6, 1962 Securities Act of 1933).*

In Australia, private offers are exempt from the prospectus provisions as the number of parties involved in the issue is relatively small and the level of sophistication of the target investor is considered to be higher than the average member of the public. The exemption applies in Australia when: (1) the firm places more than \$0.5 million worth of shares in the hands of an individual private investor<sup>29</sup>; (2) the placement is made to exempt institutions such as securities dealers, investment advisers, life insurance companies, superannuation funds or approved deposit funds, terminating building societies, friendly societies, investment companies and security investment funds<sup>30</sup>; (3) the total number of private investors subscribing to new shares is less than 20 in a 12 month period<sup>31</sup>; (4) the issue of shares is made pursuant to an underwriting agreement<sup>32</sup>; (5) an allotment is made to an employee or group of employees<sup>33</sup>; or (6) the issue has been specifically declared as an excluded issue<sup>34</sup>. Hambrook & Farrar (1991) suggest that exemption from prospectus provisions for private issues provides a balance between investors' need for information and cost effectiveness<sup>35</sup>.

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<sup>29</sup> Section 66(2)(a).

<sup>30</sup> Various parts of ACL reg 7.12.05.

<sup>31</sup> ACL Section 66(2)(d).

<sup>32</sup> ACL Section 66(2)(b).

<sup>33</sup> ACL reg 7.12.05(b).

<sup>34</sup> ACL Section 66(2)(n).

<sup>35</sup> Refer to ACL - Principles and Practice paragraph 7.40020, 74,104.

Private offers made before listing, and where the firm has an intention to list<sup>36</sup>, commonly disclose information concerning the issue in an explanatory or information memorandum. This document until July 1998 may have differed markedly from a prospectus as it was circulated to a small number of potential clients, was not subject to onerous disclosure requirements, and was considered private and confidential by the recipient<sup>37</sup>. However, information differences between public and private pre-listing disclosures have become less likely as a result of changes made to the Australian Stock Exchange Listing Rules (ASXLR) [see ASXLR (1999, *Chapter 1, 1.1, Condition 3*, p102,). The present rules require firms not making a public issue at the time of quotation and having the intention of not issuing further shares in the subsequent three month period, but satisfying shareholder spread requirements, to provide pre-quotation disclosures by way of an information memorandum satisfying ASX Listing Rules Appendix 1A. Specifically they must provide “all the information that would be required under Section 1022 of the Corporations’ Law if the information memorandum were a registerable prospectus” under ASXLR Item 108. Consequently, issues made after the adoption of these listing rule changes mandate a common platform for disclosure for all entities intending to list. This enhances greater uniformity of disclosure through the check list provisions of ASXLR Appendix 1A.

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<sup>36</sup> Subsequent and intermediate changes were made to securities legislation concerning the definition of a ‘disclosing entity’, that is subject to the ambit of the enhanced disclosure ‘ED’ provisions from July 1994. However, there also exist provisions under section 111AQ to allow prospectus relief for enhanced disclosure ‘ED’ securities, and more general exemptions under section 111AS permitting exclusion by regulation and section 111AT for specific exemptions made by the Commission. These existence of such rules imply that securities held by non-vendor interests, prior to quotation could then be traded on the stock exchange without restriction.

<sup>37</sup> As an interesting aside, approval has also been granted for the provision of information about new issues and internet-based selling for direct placements, satisfying Regulation D. If information is available on password protected web-sites, then for all intents and purposes, qualified investors would be able to access information and the issuing firm and its promoters would not be involved in general solicitation or advertising under the legislative requirements - refer to Fisch, (1998, p27).

## **2.3 Steps in the Equity Formation Process**

This section describes the primary equity formation process in Australia. When raising new equity, the firm needs to make a number of critical decisions. In particular, the firm needs to decide which legal and accounting agents to appoint, whether it will appoint an investment bank to promote the issue, whether it will source new equity via a direct placement or initial public offering, whether the issue will be underwritten, and how the issue will be promoted, priced and traded. Each of these issues will be considered in turn.

### **2.3.1 The Appointment of Agents to Assist the Firm**

One of the first considerations for the firm is to determine whether or not an agent<sup>38</sup> is needed to assist in the promotion of the equity issue. Here the firm assesses the expected size of the issue and the extent to which it has sufficient knowledge, resources on hand, and close association with potential buyers of the issue to independently carry out the pricing, marketing and distribution of the shares. It is extremely rare for a firm issuing equity capital for the first time to possess all the necessary characteristics required for successful flotation on the stock exchange. Realising that raising primary equity is often a daunting task for the uninitiated, merchant banks<sup>39</sup> and stockbrokers<sup>40</sup> have developed a niche in the provision of specialised assistance to issuing firms. Consequently, issuing firms often engage agents who provide a wealth of accumulated experience in raising new equity,

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<sup>38</sup> The use of the word agent (singular) does not preclude the prospect of multiple agents. It is also possible that a more than one agent is involved. For particularly large offers, the issue may be syndicated and risks shared by members of the syndicate.

<sup>39</sup> Merchant banks are known as investment banks in the U.S.

<sup>40</sup> Prior to the deregulation of the stockbroking industry in 1984, the official listing rules of the ASX required a 'sponsoring stockbroker' to be engaged for any float. Today, professional advisors (which may include stockbrokers) are often used, but are not mandatory.

including advice on the timing, pricing and certification of the issue, as well as the marketing and distribution of the offering (full-service). Benveniste & Spindt (1989, p267) suggest that issuing firms in the U.S. consult their advisers on a range of items including market conditions, packaging arrangements, the technical details of corporate registration, and financial advice in the early stage of the issuing process.

Merchant banks and stockbrokers often act as agents, offering specialised skills and knowledge acquired through repeated involvement in raising equity. When seeking an investment bank or stockbroker as an agent, the firm prepares a strategy in the form of a business plan<sup>41</sup> which provides information concerning the firm's future profitability, the possible directions the firm could take through investment strategies, and the views of the firm's management with respect to the pricing of the intended issue [see Weate (1991, p117)]. These parties may be selected as the result of: (i) an on-going long-term relationship between the firm and the agent; (ii) the agent's reputation concerning past issues; (iii) a recommendation from an independent party; or (iv) through a competitive tender system. Of these, reputation is believed to play the most significant role in the issuance process [see Beatty & Ritter (1986), Balvers, McDonald & Miller (1988), Carter & Manaster (1990), Nanda & Yun (1997) and others]<sup>42</sup>.

In reviewing the prospectus documents collected for this dissertation it appears that the range of activities undertaken in Australia by agents is similar to those offered by investment banks in the U.S. While some firms may not require an agent to price and

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<sup>41</sup> The aim of the business plan is to attract and inform potential parties who may assist in the flotation.

<sup>42</sup> The impact of reputation is discussed in more detail in Section 5.2.3(b).

distribute the offering<sup>43</sup> (particularly those firms operating in the stockbroking and investment advisory community, which are capable of self-marketing<sup>44</sup> because they have many customers who are willing to become shareholders), the majority of equity seekers do require such services (over 90% of issues in Australia during 1983-1997).

A business plan is generally circulated to one or several potential parties, but often the choice of the investment bank depends on word of mouth recommendations from lawyers and accountants already known to the firm<sup>45</sup>. The recent trend towards tendering for underwriting contracts in Australia is a major departure from past practice. If a potential investment bank is interested in the firm's business plan, a series of intense discussions takes place between the firm and the underwriter, often with the legal and accounting professionals present. As part of the due-diligence process, investment banks often call for additional information or require verification of documentation already included in the business plan. This exercise allows the investment bank to form an expectation of the offer price. These discussions eventually evolve into negotiations concerning key aspects of the float such as: (i) the size of the float, measured in terms of the number of shares and the offer price; (ii) whether the issue is to be underwritten and/or syndicated and by which organisations; (iii) the size of the agent's fees (including the roles

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<sup>43</sup> Where a firm does not appoint an agent, the procedure described above is undertaken in-house. This situation in practice is rare, but may occur when a division of an existing firm is re-listed and an equity injection is sought from shareholders from the original firm (these are called spin-offs or privileged offers). This was a popular form of issue in Australia during 1985-1986. If the distribution of the issue is limited to institutional investors and exempt parties, then disclosure by way of prospectus is not required and only an information memorandum needs to be used, thereby reducing issue costs further.

<sup>44</sup> Evidence provided by Muscarella & Vetsuypens (1989) find that organisations capable of self-marketing like investment bankers are still underpriced by 7.12% for 38 banks issuing from 1970-1987. Megginson & Weiss (1991) find that for IPOs with venture capitalist backing, the costs of going public are reduced. In Japan, Hamao, Packer & Ritter (1998, p5) find that where the IPO is venture capital backed by an affiliate of the lead underwriter, the issue does not experience lower initial returns.

<sup>45</sup> This fact was established via interviews with Australian investment banks and is consistent with comments in NASDAQ (1998, p57).

of the adviser, broker and underwriter which may not necessarily be the same party)<sup>46</sup>, as well as other specific conditions associated with the issue<sup>47</sup>; and (iv) the method of distribution. This particular sequence of decisions, which is consistent with that reported in the U.S. by Pugel & White (1988), forms an important and critical assumption underlying this research. The order of decisions taken during the primary issue affects the manner in which theoretical models in chapters 4 and 5 is formulated.

At this time, the firm also appoints a legal advisor (whose primary responsibility is to be familiar with the rules, regulations and protocols governing the underwriting process, intellectual property and corporate registration requirements) and an auditor (whose responsibility is to ensure that the accounting information contained within the offer documentation is consistent with generally accepted accounting procedures (GAAP) and (often) to prepare a statement of earnings forecasts based on financial modeling techniques). The credibility of the auditor, legal advisor and investment bank certifying the issue is utmost in the minds of potential investors as the level of information asymmetry is particularly high between potential investors and insiders of the firm [see DeAngelo (1981), Titman & Trueman (1986), Beatty (1986), Simunic & Stein (1987), Bachar (1989), data, Feltham & Hughes (1991), Hogan (1997) and Lee, Stokes, Taylor & Walter (1999) *for audit reputation*, and, Beatty & Ritter (1986), Booth & Smith (1986), Johnson & Miller (1988), Carter & Manaster (1990), Megginson & Weiss (1991), Cheung & Vos (1992), Chemmanur & Fulgheri (1994) and Carter, Dark & Singh (1998) *for underwriter*

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<sup>46</sup> An inspection of Australian prospectuses released between 1983-1997 indicates that the fee structure charged by underwriters for services rendered is non-standard, in terms of value and form. With regard to form, there does not appear to be any discernible trend in support of fixed, variable or a mixed fee basis. This is in direct contrast to the 7% solution identified by Chen & Ritter (1999), which implies that US underwriters appear not to compete on price as there is a substantial clustering of fees at exactly 7%.

<sup>47</sup> Such as over-allotment options and specific 'out' clauses.

*reputation*].

After successful completion of the various negotiations, the contracts between the firm and the various agents are signed. Details of the contractual arrangements between the issuing firm and related parties must be reproduced in the prospectus for public offers and the information memorandum for direct placements under the Australian Corporations Legislation Schedule 7 and AASB1017 (which is consistent with International Accounting Standard - IAS 24). While the legal requirement took effect from June 1997, the disclosures were generally made from the early 90's as a voluntary guideline existed<sup>48</sup>. Frequently the nature of the firm's activities call for an independent report, assay, valuation or further technical discussion provided by an expert. Experts can take many forms, such as independent accountants, consultative geologists in the case of mining companies, and engineers<sup>49</sup>, and this opinion is also included with the documentation prepared by the issue consortium<sup>50</sup>.

### **2.3.2 Method of Distribution**

The methods of equity distribution (IPO versus Direct Placement) may be distinguished in terms of the size of the target shareholder group. Currently, the Australian Stock Exchange requires each issuing firm to have a minimum spread of 500 existing

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<sup>48</sup> For further information on the historical developments of this standard refer to Walker & Robinson (1994).

<sup>49</sup> A list of the information required by law to be included in a prospectus is dealt with under ACL Section 1022.

<sup>50</sup> Recent amendments to the Australian Corporations Law (effective from 1991) have created problems in interpreting what information is to be disclosed in a prospectus. Legislation stipulates that the prospectus furnishes "all information relevant and necessary to the making of an informed investment decision". The vagueness of this requirement appears to be one of the main explanations for the small number floats observed in 1991-1992. Refer to the Commonwealth Corporation Act (1989) and the ASC Policy Discussion Paper Corporations Act (1989) Fundraising by Companies: Operation of Prospectus Provisions under Division 2 of Part 7.12 dated June 20, 1990 and Green (1991).



shareholders prior to listing [see ASX Listing Rule 1.1 Condition 7]. Frequently, if the firm does not meet this requirement, it will use the initial public offer mechanism. Alternatively, it may already satisfy the listing requirement, in which case the firm is free to choose between an IPO and the direct placement method. In choosing, the issuing firm is indirectly deciding upon its ownership structure. As described in Section 2.2.1, direct placements are marketed to larger private or institutional investors, whereas IPOs are aimed at the public in general (which include the former category of investors).

When assessing the appropriate method of distribution, the firm takes into consideration its expectation in regard to the size, price and timing of the issue, the relative cost of regulatory requirements under alternate distribution methods, and the extent to which potential subscribers are known by the firm/promoter coalition. Local knowledge of market demand by the investment bank and promoter(s) also has an impact on offer characteristics [see Baron (1979, 1982)]. The determinants of distribution choice is analysed in greater detail in Chapter 5.

### **2.3.3 Underwriting the Issue**

Underwriting provides a number of benefits to the issuing firm. In particular, underwriters are often appointed to reduce the firm's exposure to the possibility that the issue is not fully subscribed [refer to Ross, Westerfield & Jaffe (1991, p517)]. Underwriters play an active role in the equity formation process and by virtue of the underwriting agreement, the risk of under-subscription is shifted to the underwriter, for a fee<sup>51</sup>. The function of the underwriter is to stimulate the demand for shares and, if demand

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<sup>51</sup> In the U.S., Ritter (1987) argues that little risk is actually transferred as the proceeds from the offer are not guaranteed in a firm commitment offer until book-building has been completed. This may also be true in the case of larger issues in Australia.

is weak, the underwriter is contractually obliged to take up the shortfall at a pre-specified price,  $p_s$ , subject to the terms of the contract. This pre-specified price represents the extent to which the fixed number of shares on offer,  $n$ , is underwritten. The guaranteed minimum subscription value for the offer,  $V_m$ , is the product of the proportion of the issue underwritten,  $k$ , the number of shares offered,  $n$ , and the pre-specified price,  $p_s$ :

$$V_m = k.n.p_s \quad (2.1)$$

In the case of a fully underwritten issue,  $k$  is considered to be 100%, and the value of the issue is denoted by  $V$ . To compensate the underwriter for the additional risk borne, a fee,  $f$ , is paid which equals the difference between the total proceeds and the minimum subscription value of the issue, plus any reimbursements and non-cash remuneration such as options or shares<sup>52</sup> :

$$f = V - V_m + \text{reimbursed costs} \quad (2.2)$$

While it has been commonly understood that this fee compensates underwriters for the risk they bear, a recent working paper by Chen & Ritter (1999) observes that in the U.S. over the period 1985-1997, the gross underwriting spread of 60.5% of a total of 2,983 initial public offers with proceeds of at least US\$20M was a flat rate of precisely 7%. Moreover, the proportion of underwriters charging 7% had increased from earlier years in the sample. The authors argue that this clustering of spreads over time is an interesting curiosity, as the flat service fee does not appear to be strongly related to issue size, direct costs of distribution, or reputation. This result is also observed by Hansen (1999).

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<sup>52</sup> Barry, Muscarella & Vetsuypens (1991) argue that options are more likely to be included in the promoter's compensation package for riskier issues that would be extremely costly to issue if the fee was cash based.

Furthermore, the empirical evidence appears consistent with the existence of strategic pricing (i.e. not cutting fees to gain market share because of anticipated responses from competitors) amongst investment bankers. Chen & Ritter point to anecdotal evidence from casual discussion with U.S. underwriters which also suggests that the spreads result in IPO underwriting being quite profitable. There is evidence of weak clustering in underwriter spreads reported in Canada with roughly one-third of all issues (based on a sample of 330 Toronto Stock Exchange issues from 1984-1997) reporting discrete clustering at 6% and 6.5% [see Kryzankowski & Rakita (1999)]. The distribution of average gross underwriting spreads for Australian IPOs by issue size is documented in Chapter 3.

In the U.S., the level of underwriter risk when book-building is used is relatively small as the offer price is normally set within hours of the allotment of shares. The demand for the issue is not expected to vary significantly over a narrow window of time [see Pichler & Wilhelm (1999, p1)]. In comparison, the level of risk assumed by underwriters is significantly higher in Australia, as the fixed price mechanism is commonly adopted. Under this mechanism, the underwriter is exposed to a six week selling period in which the offer price is set and the demand for shares may vary.

The responsibility of the underwriter is not limited to the sale of the issue and extends beyond the date of listing. Thus, underwriters provide some form of indirect 'insurance' or protection to issuing firms<sup>53</sup> and certify the validity of financial disclosures and corporate valuations on behalf of potential shareholders and the marketplace generally

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<sup>53</sup> See Tinic (1988), Hughes & Thakor (1992), Alexander (1993) and Hensler (1995). The legal insurance argument is based on the underwriter's certification role. In Australia, the primary responsibility for corporate decision making is vested with the board of directors. However, potential exists for any legal claims on the directors to be extended to their professional advisers. A contrary view by Drake & Vetsuypens (1993, p65) suggests that there is not a significant difference in underpricing between IPO issues that are subject to litigation versus those which are not, consequently, they believe that underpricing is not an efficient means of law avoidance.

[see Booth & Smith (1986)]. Underwriters may also have an implicit agreement to provide future research reports in an attempt to lift the future demand for shares after listing. Such motivations are discussed at length in Michaely & Womack (1998). There is also evidence in the U.S. that underwriters often serve to ensure post-listing price stability. This involves buying in the after market to ensure that the market price will not decline below the offer price [see Prabhala & Puri (1998) and Ellis, O'Hara & Michaely (1999)].

Where a prospectus is shown to contain false or misleading statements, or material information has been omitted, shareholders may sue promoters (primarily the underwriter and accounting professionals) of the issue for damages. In the U.S., parties can recover loss of capital value (either realised in the case of disposal of the holding or unrealised if the shares are still held by the shareholder at the time of the court hearing) from promoters and/or directors [see Hughes & Thakor (1992, p5)]. In Australia and New Zealand similar provisions have existed since 1991, requiring that the prospectus should "contain all reasonable information an investor requires in order to make an informed investment decision"<sup>54</sup>. However, the effectiveness of this requirement has been severely weakened by the Australian Securities Commission's reluctance to prosecute and thus prove that the investment relied on incomplete or misleading information contained within the prospectus [see Gordon (1992, p26)]. To date, there have been no successful cases of indictment in Australia.

The role of the investment bank in the equity formation process is a key element used in distinguishing between contractual forms of underwriting. That role may be either active or passive. When an active role is taken, there is a notable shift in responsibility for

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<sup>54</sup> ACL Section 1022.

the issue from the firm to the investment bank, as in the case of a firm-commitment contract. Less responsibilities are taken with best-effort contracts, as the minimum value of funds raised is not guaranteed (underwritten). These responsibilities were previously discussed in Section 2.2.1(a).

#### **2.3.4 Marketing the Offer**

The next phase in the issuance process involves marketing the offer. In Australia a maximum of six months is reserved for promoters to sell a public issue. It is general practice for promoter(s) to 'road-show' the issue, by presenting relevant material to large institutional and other potential private clients. However, high pressure direct marketing campaigns and door-to-door canvassing is strictly prohibited<sup>55</sup>.

For direct placements, the distribution of information memoranda and the road-shows are the only marketing activities undertaken. The quantity of shares sold in a direct placement is usually determined on a client to client basis as the blocks of shares are usually 'reserved' for different classes of private or institutional investor<sup>56</sup>. This is in stark contrast to the public offer, where the potential set of investors is more widely spread. The marketing effort for public issues involves selling a smaller parcel of stock (quantity) to a larger clientele, and is required to ensure that any invitation made to the public is accompanied by a prospectus<sup>57</sup>. However, exemptions from this requirement may be

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<sup>55</sup> Under ACL Section 1078.

<sup>56</sup> This process is similar to the concept of wholesaling in the marketing literature.

<sup>57</sup> Under ACL Section 1079. Recent technological advances in mass media, broadcasting, cinematography and television are recognised as 'writing' for the purposes of interpreting current legislation under ACL Section 1079. There is yet, no specific discussion on the internet.

granted under Section 1025(2)<sup>58</sup>. The sale of the issue is carried out by telephone until either the issue is fully or over-subscribed or the closing date for applications is reached. Interviews with promoters suggests that over 95% of issues are fully subscribed, many of which reach this level before the designated applications close date. For over-subscribed issues, the allocation rules agreed to in the underwriting contract and published in the prospectus apply. In the absence of such rules, there is no requirement in either the listing rules or legislation for subscribers to be allocated shares on an equal basis. However, the offer price must be the same for all shares contained in the prospectus. The allocation of shares may be determined on a pro-rata basis, first-come first-served basis, or at the discretion of the underwriter. Generally, full application monies are to accompany the application form and are normally paid for by way of a bank cheque. Funds received over and above the minimum subscription value stated in the prospectus are generally returned to the subscriber, unless a specific over-allocation (or over-allotment) option applies.

### **2.3.5 Pricing the Issue**

The method of setting the offer price depends on how the issue is to be sold. In Australia, investment banks have until recently adopted an issue mechanism which can be described generally as a traditional, fixed price, fixed quantity offer, however other forms of price determination exist internationally [see Biais & Faugeron-Crouzet (1998)].

The pre-specified offer price,  $p_s$ , under the traditional fixed price offer mechanism can be thought of as a private estimate of the share's market value, conditioned on the private information set available to the issuing firm and/or promoter. This price reflects the

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<sup>58</sup> For example, the Commonwealth Bank of Australia float in 1991.

promoter's perceived risk of selling the issue<sup>59</sup> and may be chosen strategically. Thus, we cannot assume that the offer price is a market clearing equilibrium price. Recall, under the underwriting contract, the underwriter assists in the establishment of the offer price, and often guarantees a minimum subscription level (under what is known as a firm commitment contract). Consequently, the underwriter's interests may not be entirely consistent with that of the issuing firm, which aims to maximize total proceeds raised. By deliberately underpricing primary issues, risk averse promoters can improve the initial yields earned by maiden shareholders, thereby ensuring sufficient demand for the issue to meet their contractual obligations specified in the underwriting contract. Hence, Ibbotson's (1975) reference to 'money left on the table', suggesting that underpricing forms a financial incentive to attract shareholders to hold newly issued securities they otherwise would not consider.

Setting the offer price is more complicated in privileged or tiered issues, which have gained in popularity in Australia in the 1990's [refer to the description of privileged offers in Section 2.2.1(a)(ii)]. This complexity is because the offer price may not be the same across investor types. It has become widely accepted that the public offer is a fixed price - usually fixed quantity arrangement which closes before the institutional offer. The institutional offer is by way of a limited range tender, where an ex-ante range of acceptable bids is set out in the offer document, and the final price is determined through the tender process itself (different rules may apply as to how the actual offer price is determined). For existing private shareholders and employees, the offer price conditions are usually the same

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<sup>59</sup> Arguably the perceived risk may include a price discount for the risk expected to be incurred plus a safety margin. Given the information asymmetries, the information possessed by the promoter as to the likely demand distribution is not revealed to the firm directly, so that it is possible that the underwriter is in a position to extract more than the risk-adjusted rent from the issuer. One cannot test this conjecture however.

as the public offer. However, preferential status is given to them by ensuring that a proportion of the public offer is reserved for the related parties. The use of tiered offers has been most prevalent in privatisations and larger-sized floats, like Woolworths Limited which floated in July 1993.

The potential for different offer prices for different types of investors to be set in a rational pricing framework is provided in Mello & Parsons (1998, corollary 2, p97). They find that making an allocation to institutional and block shareholders increases the market value of the firm for all shareholders. This is because the holder of a controlling block of shares can undertake valuable monitoring activity. Smaller shareholders however gain benefits from free riding on existing monitoring activity and are prepared to pay a higher price to hold the shares relative to an blockholder that must incur directly the costs of monitoring<sup>60</sup>.

In a few countries, competitive auctions are used to distribute and allocate primary shares issued. This method is viewed as providing a better market-related pricing mechanism, as evidenced by the studies from France [see McDonald & Jacquillat (1974) and Derrien & Womack (1999)], the Netherlands [refer to Wessels (1989)] and Singapore [see table 2.1 below as well as Loughran, Ritter & Rydqvist (1994)]. Auctioning primary equity allows the offer price to be set according to the level of demand for securities, and it has been observed that the level of underpricing is negligible in these markets after accounting for transaction costs. The dutch auction system forms the basis for pricing web-based offerings in the U.S. W.R. Hambrecht & Co uses the internet to pre-register

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<sup>60</sup> Interestingly, the information and timing aspects of this model do not seem to be consistent with Rock (1986), that informed demand rush highly underpriced issues as in Mello & Parson's model the uninformed are given priority to stock.



interested investors and shares are allocated to the highest bidders [see Tully (1999, p118)].

Pricing may also be indirectly affected by the exercise of an over-allocation option (called an over-allotment option in the U.S.). An over-allocation option permits the firm to raise additional equity at the same pre-specified fixed price. Rather than resulting in extreme price discounting, which is a net loss to the firm, the firm can increase the total value of funds raised by increasing the quantity of shares sold. In the U.S. an additional 15% of the value of the initial offer is permitted. In Australia, 10% is common, but the exact value is required to be disclosed in the prospectus<sup>61</sup>. By increasing the quantity offered in the event of excess demand, the underwriter also reduces the observed level of underpricing when the shares begin to trade.

### **2.3.6 Trading on the Stock Exchange**

For firms intending to list on the stock exchange, the formation of new primary equity improves both the permanent capital base of the firm and the liquidity of the firm's shares through the creation of a secondary market for shares [see Marshman & Davies (1991)]. Listing also enhances the reputation of the firm through greater public disclosure of information relevant to the firm's operations and improves the prospect of further equity expansion, via secondary offerings. Weate (1991, p129) suggests that listed firms are characterised by a history of profit and price performance as well as a committed body of shareholders. This enables additional funds to be subsequently raised in the form of pro-rata issues to existing shareholders or qualifying holders, placements, shares used as

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<sup>61</sup> Weiss (1989) observes that 65.75% of these options are exercised in the U.S. The proportion adopted in Australia is presently unknown.

consideration in takeovers and spin-offs to existing shareholders, dividend reinvestment plans, convertible notes, and options.

### **2.3.6 (a) The Underpricing Phenomenon**

Having allocated the shares to successful subscribers of a new equity issue, trading of the shares commences in the secondary market. Subscribers wishing to liquidate their position can place offer quotes, and investors unable to obtain shares at the time of the float may bid for shares in the firm. For most new primary issues, the first trade often takes place at a price in excess of the subscription price. Primary issues of equity capital are frequently and on average underpriced, presumably offering higher abnormal returns to attract investors into this relatively high risk sector.

Underpricing has been examined in a multitude of studies, the detail of which is beyond the scope of this dissertation. However, several rationales for the existence of underpricing have been reported in the underpricing literature, and these can be categorised as hypotheses concerning: (i) *transfer of wealth* [see McDonald & Fisher (1972), Ibbotson (1975), Block & Stanley (1980), Noti & Hadjia (1981), Finn & Higram (1988) and Beatty (1989)]; (ii) *marketing & distribution of risk* [see Tinic (1988)]; (iii) *the opportunity cost of financing* [see Bear & Curley (1975)]; (iv) *reputation* [see Beatty & Ritter (1986), Booth & Smith (1986), Titman & Trueman (1986), amongst others]; and, (v) *information asymmetry* [see Ritter (1984), Miller & Reilly (1987), Rock (1986), Baron (1982), Muscarella & Vetsuypens (1989), Allen & Faulhaber (1989), Grinblatt & Hwang (1989), Gale & Stiglitz (1989) and Welch (1989)] explanations.

Due to the diversity of interpretations, it is difficult to synthesise a coherent and operational definition or reason for underpricing. What can be stated however, is that there

is overwhelming empirical evidence in support of a systematic and discernable price difference between the time of the offer and the first trade<sup>62</sup>.

IPO underpricing has been measured a number of ways in prior research. The underpricing for firm,  $U_j$ , is calculated as a simple return expressed as:

$$U_j = \frac{P_{j,1} - P_{j,0}}{P_{j,0}} \quad (2.3)$$

where  $P_0$  is the offer or subscription price as detailed in the prospectus and  $P_1$  is the last price recorded on the first day of listing.

Alternatively, underpricing has been interpreted as the abnormal return component using the Capital Asset Pricing Model (CAPM) under the restrictive assumptions that alpha is equal to zero and beta is equal to one. These assumptions are frequently used when a pre-event estimation window is not available [see Campbell, Lo & MacKinlay (1997)]. The empirical version of the CAPM model is presented below:

$$R_{j,t} = \alpha_j + \beta_j R_{m,t} + \hat{\varepsilon}_{j,t} \quad (2.4)$$

where  $R_{j,t}$  is the observed return of the security between the offer date and the first trade date,  $R_{m,t}$  is the observed return of the market measured over the same time interval,  $\alpha_{j,t}$  is the regression intercept and  $\beta_{j,t}$  is the measure of systematic risk. The error term,  $\varepsilon_{j,t}$ , is assumed to reflect the abnormal return which is interpreted as an alternative measure of underpricing.

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<sup>62</sup> Often the first transaction price is unobservable and researchers have used the closing price for the first day of trading to measure underpricing.

Under the assumption that  $\alpha_j = 0$  and  $\beta_j = 1$ , the error term in equation 2.4 simplifies to the difference between the return of the security and that of the market:

Hence, underpricing is frequently measured as the difference between the  

$$R_{j,t} - R_{m,t} \quad (2.5)$$
percentage change in the stock and the percentage change in a standard market index <sup>63</sup>.

Over 150 studies have examined the issue of underpricing<sup>64</sup>. Table 2.1 has been constructed from a number of studies and summarises the level of underpricing from around the world. One can see that the discount offered to induce new investors to hold shares in new offerings is significant, when comparing the offer price with the price recorded at the close of trading on the first trading day. While there is some argument that this level of abnormal return is not available to all shareholders, the breadth of the phenomenon and the magnitude of the level of underpricing suggests that it is part of the new issue culture in countries which do not adopt a competitive auction based mechanism.

Table 2.2 provides comparable data on underpricing as reported in Australian studies. Irrespective of time frame, methodology used, or sample size, the underpricing of Australian issues over a similar sample period is higher than that found in the U.S. However, the level of underpricing reported in Australian studies post 1989 needs to be viewed with caution as government privatisations may distort estimated underpricing results. Individual details for each privatisation is indicated in Table 2.3. Privatisations

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<sup>63</sup> Campbell, Lo & MacKinlay (1997, p156) argue that this form of implementation should only be used as a last resort and biases may arise if restrictions are false. However, the authors concede that the method is frequently adopted to study the underpricing of initial public offers [see Ibbotson & Jaffe (1975) and Ritter (1991), amongst others].

<sup>64</sup> The presence of underpricing exists irrespective of the type of trading system [see Affleck-Graves, Hegde, Miller & Reilly (1993)] comparing NYSE, AMEX, NASDAQ/National Market System(NMS) and NASDAQ/Non-NMS trading systems.

**Table 2.1 A Summary of International Underpricing Evidence**

Country	Research Undertaken	Sample		Initial Return
		N	Period	
Australia	Hadjia (1981), Noti & Hadjia (1983), Depiazzi (1986), Adams (1988), Finn & Higram (1986, 1988), Taylor & Walter (1990), How (1990), How, Izan & Munroe (1991), Suchard & Woo (1993, 1997)	156	1966-85	26.8%
Belgium	Rogiers, Manigart & Ooghe (1993)	28	1984-90	10.1%
Brazil	Aggarwal, Leal & Hernandez (1993)	62	1979-90	78.5%
Canada	Shaw (1971), Jog & Riding (1987 a,b), Betts & Neu (1989), Falk & Thorton (1992)	100	1971-83	9.3%
Chile	Aggarwal, Leal & Hernandez (1993)	19	1982-90	16.3%
Finland	Kelahanju (1993)	85	1984-89	9.6%
France	Jenkinson & Mayer (1988), Husson & Jacquillat (1990), Leleux & Muzyka (1993)	187	1983-92	20.0%
Germany	Uhlir (1989) Ljungqvist (1995, 1997) Aggarwal & Leal (1996)	97	1977-87	21.5%
		189	1970-93	9.2%
		142	1983-91	11.73%
Hong Kong	Dawson (1984)	34	1979-85	10.5%
Italy	Cherubini & Ratti (1992)	75	1985-91	27.1%
Japan	Dawson & Hiraki (1985) Hebner & Hiraki (1992)	106	1979-84	51.9%
		72	1970-91	32.5%
Korea	Kim, Krinsky & Lee (1993)	275	1984-90	79.0%
Malaysia	Dawson (1984), Wong & Chiang (1986)	34	1979-84	149.3%
Mexico	Aggarwal, Leal & Hernandez (1993)	44	1987-90	2.8%
Netherlands	Wessels (1989) Eijgenhuijsen & Buijs (1993)	46	1982-87	5.1%
		72	1982-91	7.2%
New Zealand	Skeggs (1985), Vos & Cheung (1992)	149	1979-91	28.8%
Portugal	Alpalhao (1990)	62	1986-87	54.4%
Singapore	Dawson (1984), Koh & Tse (1985), Wong & Chiang (1986) and Koh & Walter (1989)	66	1973-87	27.0%
Spain	Rahnema, Fernandez & Martinez (1992)	71	1985-90	35.0%
Sweden	Hogland & Ryqvist (1992)	176	1970-91	36.0%
Switzerland	Kunz & Aggarwal (1992)	42	1983-89	35.8%
Taiwan	Chen (1992)	68	1981-88	30.0%
Thailand	Wethyavivorn & Koo-Smith (1991)	32	1988-89	58.1%
United Kingdom	Davis & Yeomans (1976), Buckland, Herbert & Yeomans (1981) and Allen & Davidson (1987), Levis (1993)	297	1965-75	9.7%
		712	1980-88	14.3%
United States	Numerous studies including: Ibbotson, Sindelar & Ritter (1993)	8,668	1960-87	16.4%
		10,626	1960-92	15.3%
NOTE : The method of measuring underpricing has varied across the studies. However, the majority consider initial returns to be the excess return from the CAPM as per equation 2.5.				
Source: Loughran, Ritter & Rydqvist (1994) and also from individual studies listed above				

**Table 2.2 Evidence of Underpricing in Australia (1981-1999)**

This table details the prior empirical research on the underpricing of new issues in Australia. Each study is summarised in terms of the authors, sample used, the method used to calculate underpricing and the level of underpricing found. All studies report significant underpricing.

Study	Sample	Method Used to Measure Underpricing	Level of Underpricing (%)
Noti & Hadjia (1983)	Mar 1972 - Jun 1980: industrial & commercial (n=102)	CAPM ( $\beta=1$ ) RATS	20.8% 21.5%
Finn & Higram (1988)	Jul 1966 - Jun 1978 : industrial & commercial (n=93)	RATS	22.2%
How, Izan & Munroe (1991)	1979-1989 : mining (n=155) high technology (n=23) industrial (n=287) total (n=465)	excess market returns, log price relatives	23.7% 27.4% 9.2% 14.9%
Suchard & Woo (1993, 1997)	1983-1990 : explorer (n=152) producer (n=16) total mining (n=168)	excess market returns, log price relatives	22.5% 15.5% 21.1%
Little (1987)	Jun 1972 - Jun 1985: industrial property trusts mining (total sample n=217)	RATS	21.7% 10.3% 36.0%
How (1995)	1979 - 1990 : mining (n=130)	simple % returns, unadj.	107.12%
Lee, Taylor & Walter (1994)	Jan 1976 - Dec 1989 : industrial (n=266)	price relatives after market adjustment	16.41% 11.86%
Lyneham (1996)	Jan 1993 - July 1994: industrial (n=89) mining (n=43)	simple % returns CAPM ( $\beta=1$ )	18.13% (raw), 14.75%(adj.) 8.43% (raw), 6.72% (adj.)
Suchard & Lee (1999)	July 1991 - 1996 government privatisations (n=7)	simple % returns price relatives	11.43 %(raw), 11.20% (adj.) 10.46% (raw), 9.86% (adj.)
<b>NOTES:</b> In discussion with Dr. Jay Ritter it was brought to my attention that the use of logged returns is problematic. Log(returns) do not correspond to an economically relevant return. Since initial returns are skewed, logged returns are a biased measure of actual returns. An extensive literature survey uncovered two honours thesis from the University of Melbourne, McDonald (1992) and Mustow (1992). Unfortunately, this work did not provide summary statistics for the sample analysed. Consequently, results have not been reported.			

are unique in terms of the general population of primary equity market raisings. They are outliers in the overall distribution of new primary equity raisings by virtue of their size, reputation, and the government's desire to attract overseas investors to the float.

Empirical evidence from the United Kingdom on privatisations indicates that the level of underpricing is significantly higher than other IPOs. Menyah, Paudyal & Inyangete (1990) report evidence from 13 privatisations over the period 1981-1987 and find that the difference in first-day returns for public versus private sector IPOs is significantly different, the former gaining 45.1% relative to a sample of 148 private offerings experiencing an average return of 12%. Jenkinson & Mayer (1988) find that for the 20 privatisations undertaken over the period 1979-1987, the average level of underpricing was 22.2% compared with a range of 9-14% for other United Kingdom IPOs<sup>65</sup>. This evidence contrasts with that of Dewenter & Malatesta (1997, Table II) for Canadian and Malaysian privatisations, which are less underpriced on average relative to the general population of IPOs in those countries. Further, an international study by Levich & Huang (1999, Table 5) finds a statistically significant difference in Italy, France, Germany, the United Kingdom, and to a lesser extent Singapore between underpricing levels of privatised versus not privatised IPOs. In Italy and Germany, underpricing of privatised issues is lower than non-privatised issues. However, the underpricing data reported for Australian privatisations of 10.9% is not significantly different from non-privatised IPOs of 11.9% (after adjusting for the market), as reported by Lee, Taylor & Walter (1994).

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<sup>65</sup> This result is also found by Perotti & Guney (1993), Menyah, Paudyal & Inyangete (1995) and Menyah & Paudyal (1996) using United Kingdom data.

**Table 2.3 Underpricing of State and Commonwealth Privatisations and Large Demutualisation (\*\*) in Australia (1989- Aug. 1999)**

This table indicates the Government Business Enterprises which have sought public funds by issuing equity and one large demutualisation (AMP). In some cases, such as Commonwealth Bank and Telstra Australia, the Australian Commonwealth Government still retains partial ownership. In all other privatisations, 100% of the issue was sold to the private sector. By virtue of the size of the issue, one may observe discontinuities in the All Ordinaries indices on the day of listing.

Organisation (Founding Year)	Date of Listing [AASE]	Description	Offer Price [ ] denotes final institutional price	Issue Size (% cost)	Underpricing %
AMP Limited (1849)	15/6/98 [AMP]	General and Life Insurance	Instnl : 75M \$12.50      Public: \$12:50-16:00	\$25 million NA	84%(**)
Australian Industry Development Corporation (1971)	31/8/89 [ADD]	Specialist Development Financier & Investor	Details unknown as AIDC was taken over in 9/2/1996.	\$50 million NA	2.5%
Commonwealth Bank (1959)	12/9/91 [CBA]	Commercial and Retail Bank	Fixed offering at \$5.40 per share.	\$1.292 billion (2.9%)	17.9%
GIO Australia Holdings (1927)	23/7/92 [GIO]	General and Life Insurance	Instnl. 35% \$2.00-2.40 [\$2.40]      Public: \$2.40.	\$1.2 billion (5.94%)	4.9%
SGIO Insurance (1926)	12/4/94 [SGI]	General Insurance in WA	Fixed offering at \$1.00.	\$165 million (5.23%)	19%
Commonwealth Serum Labs (1914)	30/5/94 [CSL]	Vaccines	Instnl. 35% \$2.00-2.40 [\$2.30]      Public: 65% \$2.40 (130M)	\$302.9 million * (2.18%)	5.1%
Tabcorp Holdings Limited (Victoria) (1961)	15/8/94 [THL]	Regulated Gambling/Wagering Services in Victoria	Instnl. 35% \$2.25-2.70 [\$2.25]      Public: 65% \$2.70 (300 M shares)	\$810 million NA	-2.2%
TAB Limited (NSW) (1964)	22/6/98 [TAB]	Regulated Gambling/Wagering Services in NSW	Instnl. 35% \$1.80-\$2.20 [\$2.10]      Public: 65% \$2.05 (500 M shares)      Broker Apps. \$2.10	\$1.025 billion NA	7.3%
Qantas Airways Limited (1923)	31/7/95 [QAL]	Domestic and International Airline	Instnl. \$1.80-2.10 [\$2.10]      Public: \$2 (first 20,000 shs) then \$2.10	\$1.425 billion NA	12.4%
Telstra Australia (1901)	17/11/97 [TLS]	Telecommunications Service Provider	Instnl. \$2.80-\$3.30 [\$3.40]      Public: \$3.30 Installments - Instnl. \$2/\$1.40      Public: \$1.95/\$1.35	\$14.3 billion (Est. \$6-9M)	36.9%*
Bank of WA (1895)	15/2/96 [BWA]	Banking & Finance	Fixed offering at \$2.05.	\$437.7 million	25.85%

**Source:** Various Corporate Prospectus (\*) denotes an estimated value from the prospectus based on mid-point of the range of offer price for the institutional offer.

Note, Pacific Power and the financing of the Hills-M2 motorway are not considered privatisations as these issues do not involve the sell-off of an existing government enterprise. For a detailed discussion of privatisations in Australia, see Walker (1997).

+Payable in installments. The level of underpricing is based on the retail installment price of \$1.95 and the price at the end of first trading day of \$2.67 of the installment receipt.



Other reasons attributable for higher underpricing in Australia may relate to the avoidance of book-building (only recently adopted in Australia), smaller issue sizes, and the fact that a significant proportion of issues are priced at \$1 or less. U.S. offer prices by comparison typically range between \$8-12. Recent evidence however indicates that the level of U.S. underpricing in the last two years is unprecedented with offers frequently doubling or trebling in value upon listing [see Ritter (2000)]. These phenomenal increases in value on the first day of trading are, however, experienced mostly by internet start-ups.

The process of 'book-building', which is common in the U.S., has recently been adopted for select issues (often privatisations) in Australia since 1993<sup>66</sup>. Book-building differs from a fixed-price offering as it involves the underwriter 'pre-selling' or gaining pledges to purchase shares in advance of the setting of the offer price based on an expected bid-range. This procedure allows the pre-market indications of demand within a set price range to influence the final offer price. It is shown that book-building yields higher expected proceeds than a fixed-price mechanism when used in conjunction with over-allotment options [see Beneveniste & Busaba (1997, p383)]. Book-building also grants the underwriter considerable latitude in the preferential allocation of shares<sup>67</sup>. However, as it reduces the offer period by 1-2 weeks and allows a better matching of supply and demand forces, this mode of issuance is expected to be used more frequently in the future as it reduces potential underwriting risk.

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<sup>66</sup> A telephone interview with Johnathan Tran from Warburg Dillon Reed identified that the first offering to use book-building in Australia was the GIO Limited float in 1993.

<sup>67</sup> Recently, the financial press have expressed concern in the U.S. about the promoter's control over the allocation process. It has been observed that retail customers are left out of many IPOs, despite significant underpricing or 'money left on the table', [see McMillan (1999, 2000)]. These concerns are one of the main rationales for restoring the dutch-option auction method of allocation used in conjunction with internet offerings in the U.S. by W.R.Hambrecht.

At the time the prospectus is released, the promoters intensively advertise the offering via corporate presentations around the country and perhaps internationally. These presentations are known as 'road-shows'. An indicative offer price range is determined after the road show and this range is revealed to institutional investors to establish their expected demand for script as a function of price. Expressions of interest from these institutional investors give this procedure its name as essentially the broker is 'building the book'. For further discussion on the book-building process internationally refer to Benveniste & Busaba (1997) and Derrien & Womack (1999).

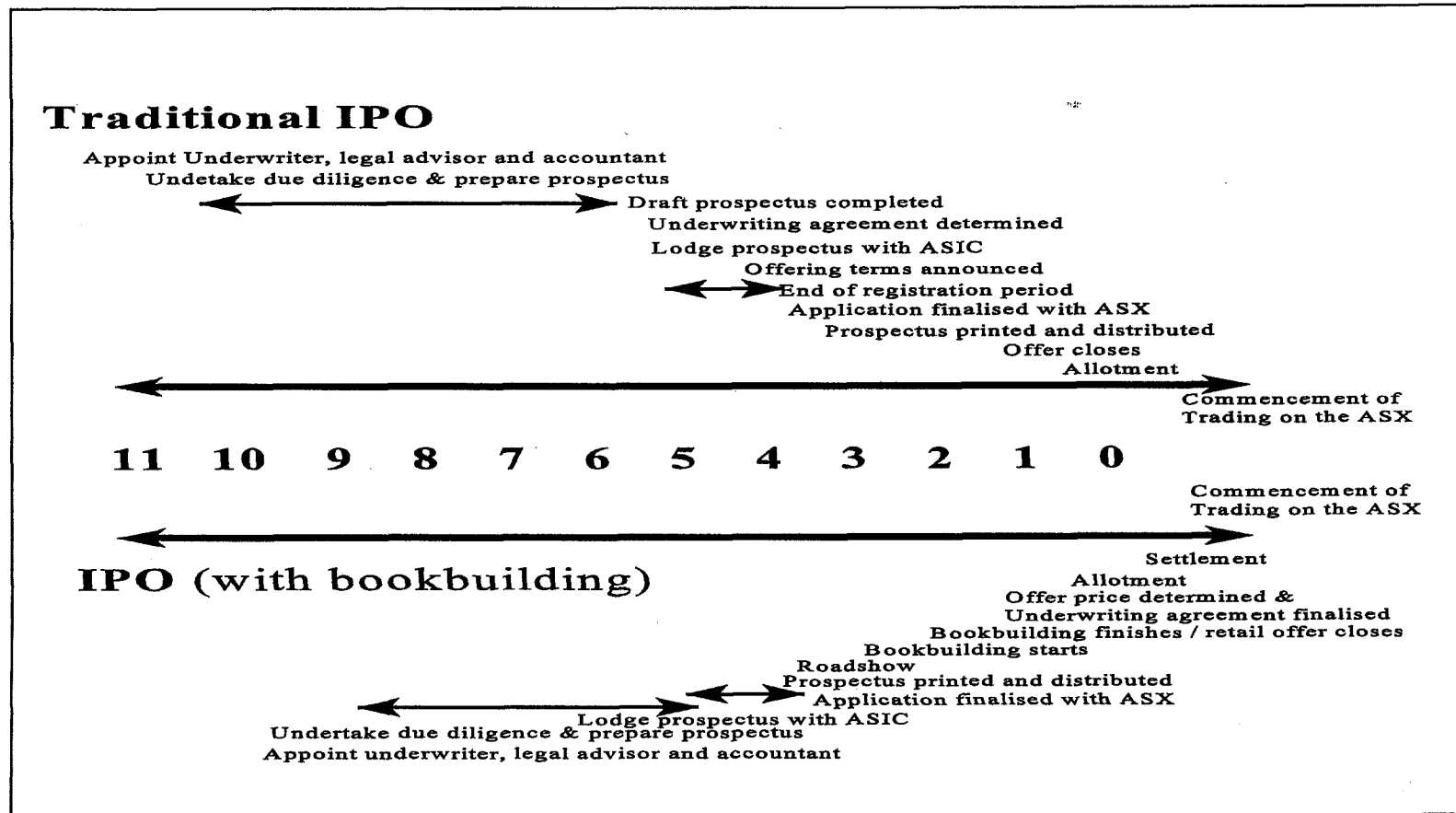
## **2.4 A Time Line for Issuing Primary Equity**

According to Curtis (1997, pp 149-151) the process of issuing securities in Australia generally follows a set time line. The entire listing process typically takes between 10-12 weeks. Figure 2.2 indicates the varying activities that need to be undertaken during the offer period. There are two main approaches to issue primary equity - a fixed-price generally fixed quantity<sup>68</sup> mechanism and book-building. Curtis estimates that the underwriter, accounting firms and legal advisors are usually appointed 10-11 weeks before quotation, after which time a due diligence period of 4-5 weeks is involved. During this period, information about the offer is produced for inclusion in the prospectus. Six weeks before listing, the underwriting agreement is signed, the details of which are included in the final version of the prospectus which is then registered with the Australian Securities & Investments Commission. After the registration period (2 weeks), the offer terms

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<sup>68</sup> Traditionally, both the offer price and the quantity of shares offered are fixed. Recently, firms have disclosed the minimum subscription level, and use an over-allocation option (OAO) to issue more shares (typically 10%) when demand is strong. However, OAOs can only be exercised if they were disclosed initially in the prospectus.

Figure 2.2 A Time Line for Issuing Primary Equity



Source: Based upon Curtis (1997, pp 149-151) and interviews with practitioners.

(including the offer price<sup>69</sup>) are announced and an application to list is made with the Australian Stock Exchange. At this point, the prospectus is printed *en masse* and distributed to interested investors. While the prospectus usually has a currency of six months, Curtis estimates that the offer usually closes within a 3 week time frame [see Section 5.3, tables 5.3 and 5.4 for a more precise estimate of the duration of the subscription period for the sample of Australian offerings examined in this dissertation]. After the offer closes, the last week before trading commences is devoted to the allotment of shares to successful applicants, any refund of monies over and above the maximum subscription amount, and the dispatch of share certificates / statements for un-certificated holdings.

## **2.5 Conclusion**

This chapter has provided a discussion of the sources of equity capital, as well as the processes and choices involved when firms raise primary equity capital and seek listing on the stock exchange. Attention has focused on each of the major decisions of the firm, including issues such as the appointment of an agent to assist in the pricing, marketing and distribution of the issue, the method of distribution, underwriting, and the determination of the offer price.

As suggested in the introduction, a unique data base has been assembled to examine primary equity formation in Australia. The structure of the database and descriptive statistics derived from it are described in detail in the next chapter.

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<sup>69</sup> One main difference between U.S. and Australian underwriting contracts is that the offer price and the signing of the underwriting contract usually takes place less than 1-2 weeks before allocation in U.S. offerings [See NASDAQ Public Release - Going Public, June 1998].

## CHAPTER 3

### THE DATABASE

#### 3.1 Introduction

In contrast with many other countries, the number of Australian studies examining primary equity offers is relatively small [see Table 2.2 for a detailed summary of Australian research to date]. These studies have often covered restricted time periods or have involved sub-samples of the overall population of primary issues encompassing: *industrial issues* [such as Noti & Hadjia (1983), Finn & Higram (1988), Lee, Taylor & Walter (1994) and Lee, Stokes, Taylor & Walter (1999) ], *resource issues* [see How (1995), Harris & Suchard (1995), Suchard & Woo (1997) and How (1995)], or *issues with an offer price over \$1* [see How (1995)]<sup>1</sup>. Moreover, studies which include both resource based and industrial listings are limited to relatively short time periods and small sample sizes such as Lyneham (1996) which includes 131 issues over the January 1993 to July 1994 period. Somewhat more comprehensive samples of IPOs in Australia are How, Izan & Munroe (1991) covering 465 mining and industrial issues from 1979-1989 and Lee, Stokes, Taylor & Walter (1999) examining 266 industrials from January 1976 to December 1989. However, both of these studies neglect listings over the last 10 years.

A potential reason for sample fragmentation in Australia is that a comprehensive database covering issue details, financial report data, share prices and trading volume is not

<sup>1</sup> Where samples are restricted to issues with an offer price over \$1, a significant number of issues are omitted. As this dissertation focuses on other flotation decisions such as choice of distribution method and underwriting, the truncation of the sample based on offer price may be misleading. Note that on this basis, the measurement of average underpricing across the sample is distorted upwards. This aspect of measurement bias is elaborated upon in Section 3.4.6(c) and Figure 3.8.

presently available<sup>2</sup>. Consequently, primary issues data must be collected manually from hard copy or its archival representation stored on compact disc.

The database constructed for this dissertation has several distinctive characteristics. The first and most interesting feature is that Australian issue documentation provides information which is not disclosed internationally<sup>3</sup>. One particular example of detailed data disclosure reported in most Australian prospectuses is the specification of the contracts that exist between the firm and its agents or promoters (e.g. underwriters and auditors). In the United States, only a measure of underwriting spread and the direct cost of issuance is discernable [see Lee, Lochhead, Ritter & Zhao (1996) and Chen & Ritter (1999)]. Variations in international information disclosures, together with the observation that Australia is a relatively non-litigious environment, serves to highlight differences in corporate regulatory structure that may affect primary issue characteristics.

This study examines primary equity issues that subsequently list on the Australian main and Second Boards between January 1983 and June 1995. By encompassing a 12 ½ year period to mid 1995, it permits comparisons with recent international studies, incorporates different market cycles (including the pre and post October 1987 stock market crash period), and allows sufficient time to study the impact of Australian Corporations Law amendments in 1991 which had a considerable influence on pre-listing disclosure.

<sup>2</sup> In Australia, a convenient and comprehensive database for primary issues like that provided by the Securities Data Inc. of the United States does not exist.

<sup>3</sup> Documentation in a prospectus or an information memorandum is not subject to a minimum checklist disclosure requirement.

A second characteristic of the database is the inclusion of both initial public offers (IPOs) and direct placements made to private and professional investors that satisfy ASX listing requirements prior to exchange listing. Convertible securities and preference share issues are excluded to avoid additional complexities associated with corporate valuation in thinly traded markets with consequent stale prices. The inclusion of hybrid securities would jeopardise comparisons of this study with international studies<sup>4</sup>.

A third important characteristic of the data is that Australian firms generally, and newly listed firms specifically, are not necessarily frequently traded. This means that the estimates of risk and returns must be carefully derived. There is a significant literature which examines the biases caused by infrequent trading, particularly on beta estimates [refer to Scholes & Williams (1977), Dimson (1979), Cohen, Hawawini, Maier, Schwartz & Whitcomb (1983) and Maynes & Rumsey (1993)]. These measures are briefly reviewed, and the method adopted to measure risk and return is discussed in Appendix II.

The remainder of this chapter explains how the database was constructed and provides a descriptive analysis of the primary features of the data.

<sup>4</sup> The reader is referred to Suchard (1999) for further details on the issuance of these types of securities.

### 3.2 Identification of the Population of Primary Equity Issues

The Additions and Removal List contained in the *Australian Stock Exchange Limited Annual Report* from January 1983 to June 1995 was used to identify firms that made primary equity issues. Primary equity issues include both initial public offers (which are identified via the issuance of a prospectus) or direct placements (which are identified via the issuance of an information memorandum). Each firm appearing on the Additions List was then assessed to establish if the primary issue satisfied two criteria: (1) that the security type related to an issue of ordinary shares; and (2) that the firm was not previously listed under another name. The latter condition was necessary as the Additions List also reports corporate name changes, re-listings after suspensions, spin-offs, mergers and reconstructions. This procedure involved cross-checking against other source material such as the *Australian Stock Exchange Journal*, *ASX Daily / Weekly Schedule and New Issues Pending*, *Shares Magazine*, *Jobson's Yearbooks*, the *Australian Public Companies Guide*, the *Mining and Oil Guide* and the *Connect 4 Prospectus Collection*<sup>5</sup>.

The direct sourcing of prospectuses or information memoranda was necessary to create the database. This was achieved by requesting information from each identified firm at the registered office as indicated by either *Jobson's Yearbook* or the *Australian Public Companies Guide*. If undertaken close to the time of listing, the collection of material was quite successful. However, a number of documents were not able to be sourced in this fashion. Consequently, approaches were made to the ASX, Big 6/8 accounting firms, and investment banks for copies of source material. In other cases, photocopies from accounting firms and investment bank libraries were sought.

<sup>5</sup> The latter was the main source of material for the later years in the sample.



The population of 1,473 primary equity issues was identified over the sample period<sup>6</sup>, for which source documentation was collected for a sample of 1,351 issues. This sample includes 916 main board (67.8% of the sample<sup>7</sup>) and 435 second board issues (32.2% of the sample).

### 3.3 Construction of the Database - Raw Data Collection

There are seven major components of the database:

- ◆ **Firm Particulars** - This information describes the issuing firm by name, AASE code and ASX-reference identifier. It indicates if the issue is an initial public offer or a direct placement, where the information was sourced, whether it is a second or main board listing, the industry code, the activities of the firm at the time of listing, its age, year of incorporation, the name of any close corporate associates if the flotation was sponsored or associated with another firm, the name of the founder(s), and the percentage ownership retained by the founder(s). If the firm was classified as a resource-based firm, an indicator variable is recorded to identify whether the firm was an explorer or a producer and a list of the minerals and metals produced or explored is included.

<sup>6</sup> The difference between the population of primary issues and the sample can be reconciled as follows. There were 60 firms where the age of the firm or founding year could not be identified, 51 with financial data missing, 2 where the share prices were not located on the share price database and 9 where the prospectuses were not available.

<sup>7</sup> Despite significant differences in size and the preferential allocation method used, privatisations were retained in the sample. To reduce the impact of extreme observations, outliers were truncated. The details of the truncation method used for each relevant variable is provided in Chapters 4 & 5.

- ◆ **Information Memorandum / Prospectus Information** - This is information contained in the issue documentation. It includes items such as the date of the prospectus, the agents of the firm (underwriters, investigating accountants, auditors, solicitors and bankers), the number of shares (current and previously issued), par value, subscription price, premium paid, options issued (current and previously issued) and the date the subscription opened and closed. There are also details on the cost structure of the float, such as the variable underwriting rate (%), the fixed underwriting rate, options issued in lieu of underwriting fees and direct formation costs<sup>8</sup>. Reputation variables are also derived for accounting firms and auditors, in terms of whether the accounting firm or auditor is ranked as a Big 6/8 (large) firm, a top 20 (medium firm) or a small firm.
- ◆ **Status of the Firm** - A study of any sample of firms over a long time period must record changes in the firm's history over the period of investigation. This subset of the database maintains changes in firm status, such as name changes, AASE code changes, the date when second board stock transferred to the main board, the date of delisting, reason for delisting, date and reason for takeover, and the date of any suspension of trading of the firm's shares.
- ◆ **Financial Information / History** - This section of the database records (on a uniform basis) basic balance sheet and profit and loss details. If pre-listing data is provided, then the first and last known historical sales and profits details are also recorded.

<sup>8</sup> When provided this was broken down by type of expenditure including auditing, investigating accountant, sponsoring brokerage & underwriting fees, advisory, legal, management, valuation, expert fees, printing, ASX listing fees, ASC registration fees and other expenses.

- ◆ **Post-listing information** - Most of the information post-listing consists of share price, volume and ownership concentration data available from the ASX. The raw data was integrated with dividend and capitalisation information to determine the adjusted daily returns, calculated on a day to day basis. The listing date of the firm is obtained from the *Additions to the Official List*. The last price on the first day of trading is also combined with the subscription price to calculate the level of underpricing. In many cases the first share price did not reconcile with the *Additions to the Official List*. Consequently, discrepancies were identified by reference to the *Australian Financial Review* and *Shares Magazine*.
- ◆ **Survival Information** - There are two items in this database: (i) whether the firm was still in existence at the end of the sample period; and (ii) the number of days the firm was listed either to the date of its removal from the Official List or to the end of the sample period, if still in existence.
- ◆ **Miscellaneous** - This section was used for the management and updating of the data collection process. It records comments and anomalies and permits fast identification of missing data items.

Appendix III provides a description of every item collected in the primary equity issue database. The data structure also highlights the representative code used, a description of the item, the format of the data collected (which could include characters (C), numeric (N), date (D) or memo (M) formats of varying length), and a brief outline as to how it is used in the analysis.

### **3.4 An Overview of the Sample of Primary Equity Issues**

#### **3.4.1 Primary Equity Formation : Number, Amount & Timing**

The value of primary equity raised for each year in the sample period is shown in Table 3.1. The 1,351 firms issuing primary equity over the period January 1983 to June 1995 for which full subscription data is available, raised a total of A\$24,219M measured in nominal dollars. To account for inflation, details of yearly changes to the Consumer Price Index (CPI) in Australia were sourced from the Reserve Bank Bulletin each June. The end June deflator was applied to all issues in a given calendar year. Correspondingly, the aggregate primary equity raised expressed in real terms amounts to A\$31,451 M (in 1997 dollars)<sup>9</sup>.

The average issue size varies considerably from year to year, ranging from A\$8.957M in 1989 to A\$309.777 M in 1991. The distortion in average issue size for the 1991-1992 period is largely due to government privatisations, particularly the A\$1.3 billion (nominal) Commonwealth Bank of Australia float in 1991 and A\$1.2 billion (nominal) GIO float in 1992 (see Table 2.3 for details of individual government privatisation offers). The largest number of primary equity issues occurred in 1987, the year of the stock market crash, when 435 issues raised a total of \$7,322.6M (in 1997 dollars). The majority of the issues in 1987 occurred in the first nine months of that year.

The average size of Australian primary equity issues of A\$23.28M (in 1997 dollars) is smaller than that in the U.S. However, there were three years during the sample period,

<sup>9</sup> Appendix IV indicates the deflator index applied to arrive at constant dollar values. The method used is described with the note accompanying the table.

**Table 3.1 Total Primary Equity Capital Raised (January 1983 - June 1995)**

The sample comprises of 1,351 firms raising primary equity over the period January 1983 to June 1995. To account for inflation, details of yearly changes to the Consumer Price Index (CPI) in Australia were sourced from the Reserve Bank Bulletin each June. The end June deflator was applied to all issues in a given calendar year.

Year	Number of Issues	Total Value of Issues (Nominal \$M)	% of Total Value	Total Value of Issues (C\$1997 M)	% of Total Value	Average Size (C\$1997 M)
1983	24	443.358	1.83%	847.244	2.69%	35.302
1984	77	909.973	3.76%	1,672.458	5.32%	21.720
1985	145	805.394	3.33%	1,388.929	4.42%	9.579
1986	272	2,196.590	9.07%	3,492.463	11.10%	12.840
1987	435	5,031.984	20.78%	7,322.572	23.28%	16.834
1988	80	1,241.696	5.13%	1,686.461	5.36%	21.081
1989	49	347.612	1.44%	438.896	1.40%	8.957
1990	10	234.839	0.97%	275.392	0.88%	27.539
1991	8	2,185.450	9.02%	2,478.218	7.88%	309.777
1992	27	2,837.694	11.72%	3,178.852	10.11%	117.735
1993	94	3,209.823	0.01%	3,529.924	11.22%	37.552
1994	114	4,316.268	17.82%	4,665.606	14.83%	40.926
1995 (to June)	16	458.683	1.89%	474.472	1.51%	29.655
<b>Total</b>	<b>1,351</b>	<b>24,219.364</b>	<b>100.00%</b>	<b>31,451.487</b>	<b>100.00%</b>	<b>23.280</b>

Source: Dissertation database.

1991, 1992 and 1994, that coincided with large government privatisations. Thus, the distribution of issue size for the Australian sample is positively skewed and highly leptokurtic<sup>10</sup>. As a rough comparison, the average issue size on the New York Stock Exchange for the 1996 calendar year, based on a total market capitalisation of US\$9.2 trillion, was a nominal US\$31.65M<sup>11</sup>.

### **3.4.2 Primary Equity Formation : Hot versus Cold Market Influences**

The term 'market ebullience' is used to describe the receptivity of the stock market to new listings and primary equity formation. In the U.S., it has been shown that the amount of equity raised at any given time has varied with the general level of stock market activity. Periods where receptivity is high are referred to as 'hot' markets while low receptivity or lack of demand is a feature of 'cold' markets [see Ibbotson & Jaffe (1975) and Ritter (1984)]. Subrahmanyam & Titman (1999) have developed a theoretical model that suggests that the relative size of the stock market and information externalities influence a firm's choice to 'go-public'. Further, their model is offered as a potential explanation for the clustering of new listings by industry.

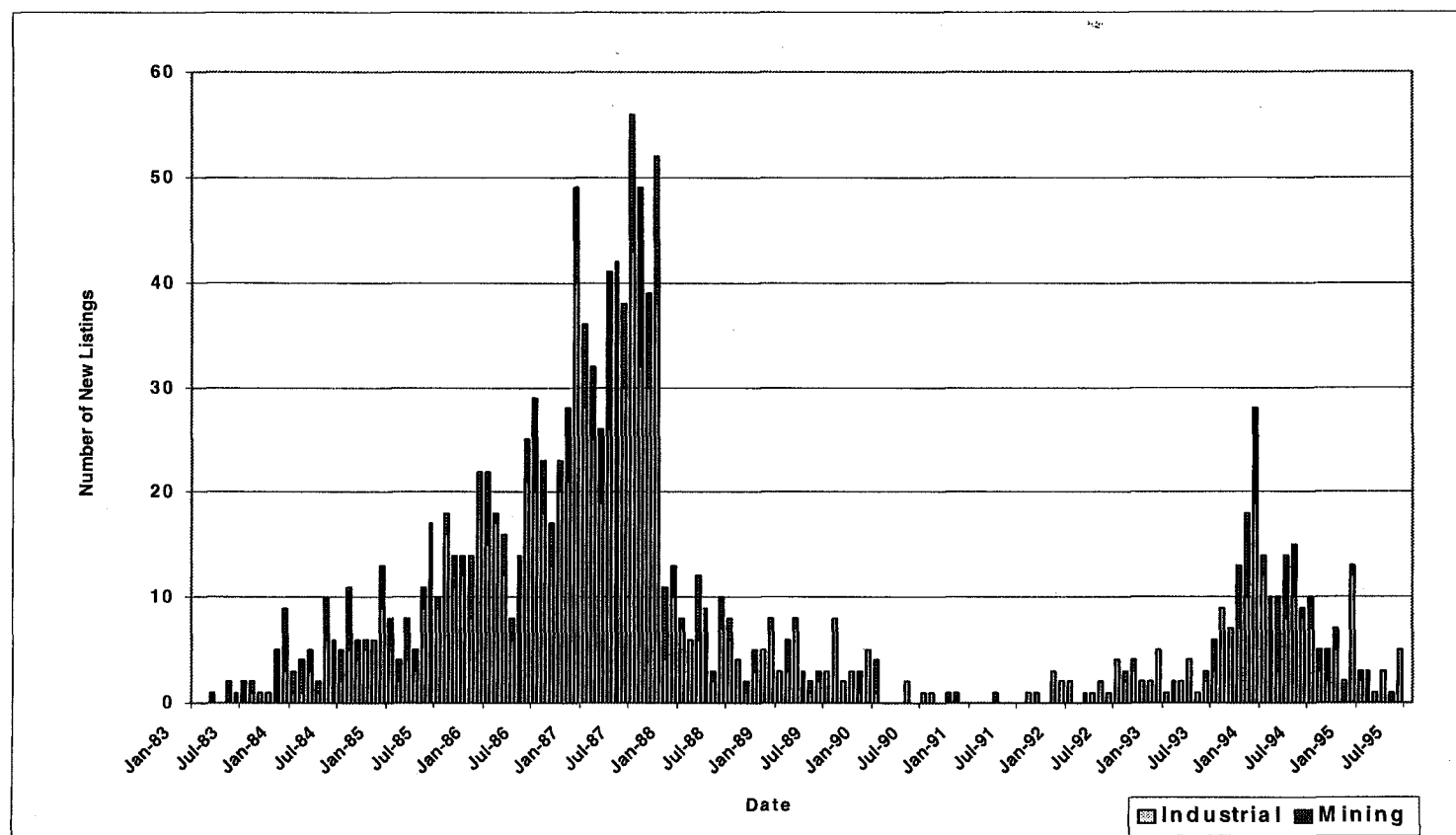
A cyclical pattern is also observed in the sample of new listings under investigation in this dissertation. Figure 3.1 shows the distribution of primary equity issues by month for the sample of 1,351 new listings. The largest number of issues in any month occurred in July 1987 with 56 firms (43 industrial and 13 resource based) listing on the stock exchange. A second peak is observed in December 1993 when 28 firms listed. Both peaks coincide

<sup>10</sup> The measure for skewness is 10.6351 and kurtosis is 146.6904.

<sup>11</sup> This is equivalent to a converted value of A\$39.8M expressed in 1997 dollars.

**Figure 3.1 - Primary Equity Issues on the Australian Stock Market (January 1983 - June 1995)**

Based on the sample of 1,351 primary issues, this figure shows the number of primary equity issues which subsequently listed for each monthly over the sample period. For a given month the proportion of industrial versus resource-based listings is shown. There is a sharp increase in issues prior to the stock market crash of October 1987 and another localised peak at the end of 1993.



Source: ASX Annual Reports.

with a resurgence in most general Australian stock market indicators. Figure 3.2 portrays a logarithmic transformation of leading monthly Australian stock market indicators, namely the All Ordinaries, All Industrial and All Mining Accumulation Indices<sup>12</sup> (dividends reinvested). Jointly, Figures 3.1 and 3.2 suggest a positive relationship between the number of new Australian listings and stock market performance. Moreover, the number of new listings is highly positively correlated with various measures of market ebullience. For example, the correlation between the number of listings per month and the monthly return of the All Ordinaries Accumulation Index is 0.788. Further, the number of new listings per month is also highly positively correlated with both the standard deviation on the market portfolio (0.764), and the measure of kurtosis of the index (0.727). The number of new listings per month is also negatively correlated with skewness in market returns (-0.746)<sup>13</sup>.

Certain periods reflect situations when investment conditions did not permit firms to raise equity on acceptable terms in Australia, and so called 'cold' market conditions were particularly evident after the October 1987 stock market crash. These periods are often considered to be associated with a higher frequency of withdrawn or unsuccessful issues. However, it was not possible to undertake this comparison as details on withdrawn issues has only been available since 1994<sup>14</sup>.

<sup>12</sup> The accumulation indices started on January 1, 1980 with a base of 1000.

<sup>13</sup> This observation of new issue activity appears is consistent with Ritter's (1984) findings of hot and cold markets (ebullience) in the United States. There is a sharp run-up in the number of firms seeking listing prior to the stock market crash in 1987 and a subsequent decline in the 1988-1992 period.

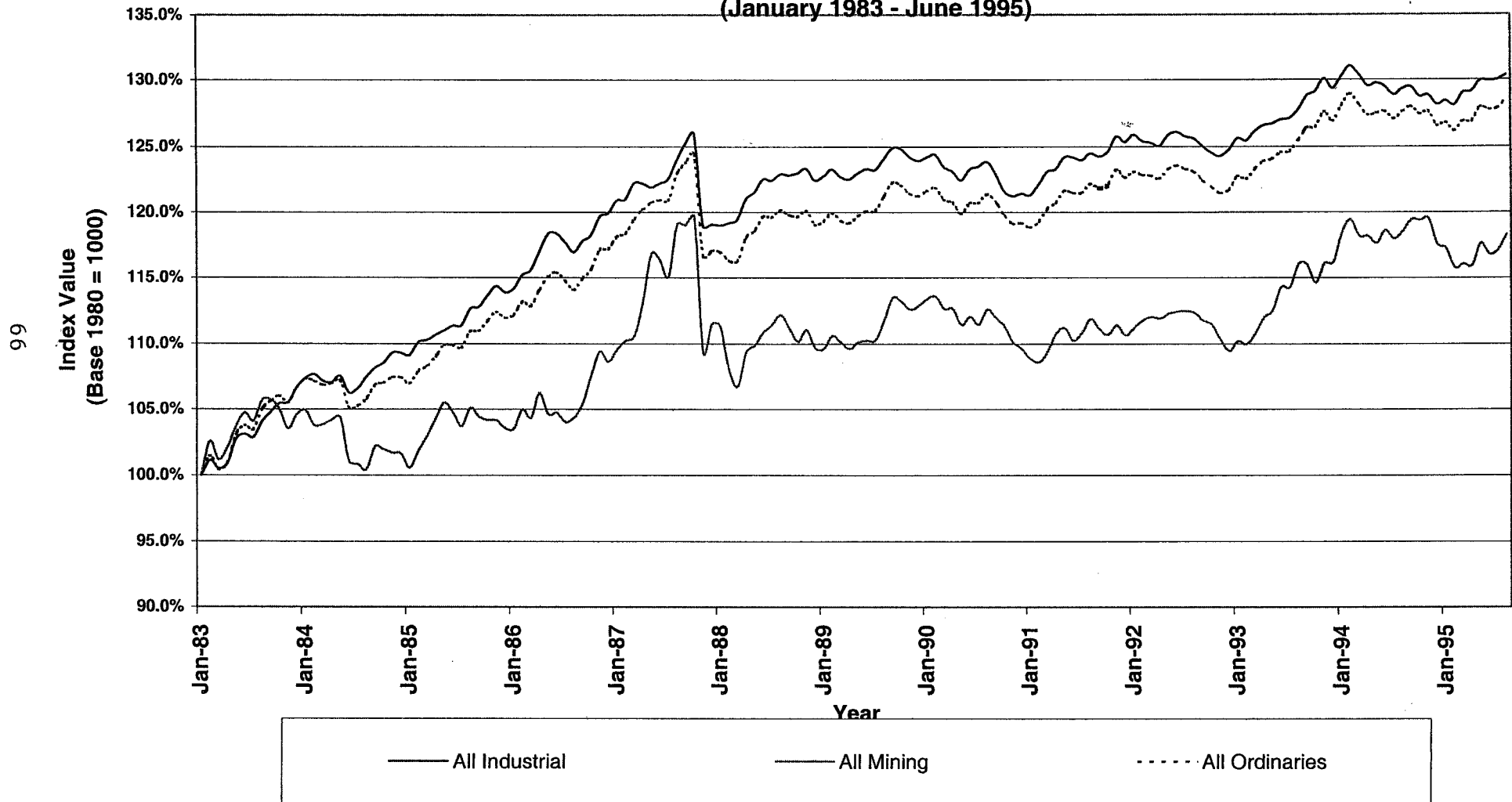
<sup>14</sup> Establishing the number of withdrawn issues is not a simple task in Australia, as publicly available records of prospective issues have only been compiled since 1994. Based on the *Connect 4 - Company Prospectus* database, the number of withdrawn issues from 1994-1997 by year and firm name is summarised in Appendix V.



Figure 3.2

## Monthly Leading Australian Stock Market Indicators (log transformation)

(January 1983 - June 1995)



### 3.4.3 Primary Equity Formation : By Industrial Classification

Figure 3.3 shows the yearly distribution of the number of primary equity issues disaggregated into broad industrial and resource-based classifications. There are 994 industrial and 357 resource-based primary issues in the sample. Similar patterns in listing exist between the industrial and resource-based sub-samples. There is a run-up in listing activity between 1983 to 1987. The number of primary equity issues then declined sharply from 1988 to 1991 and recovered somewhat after 1992.

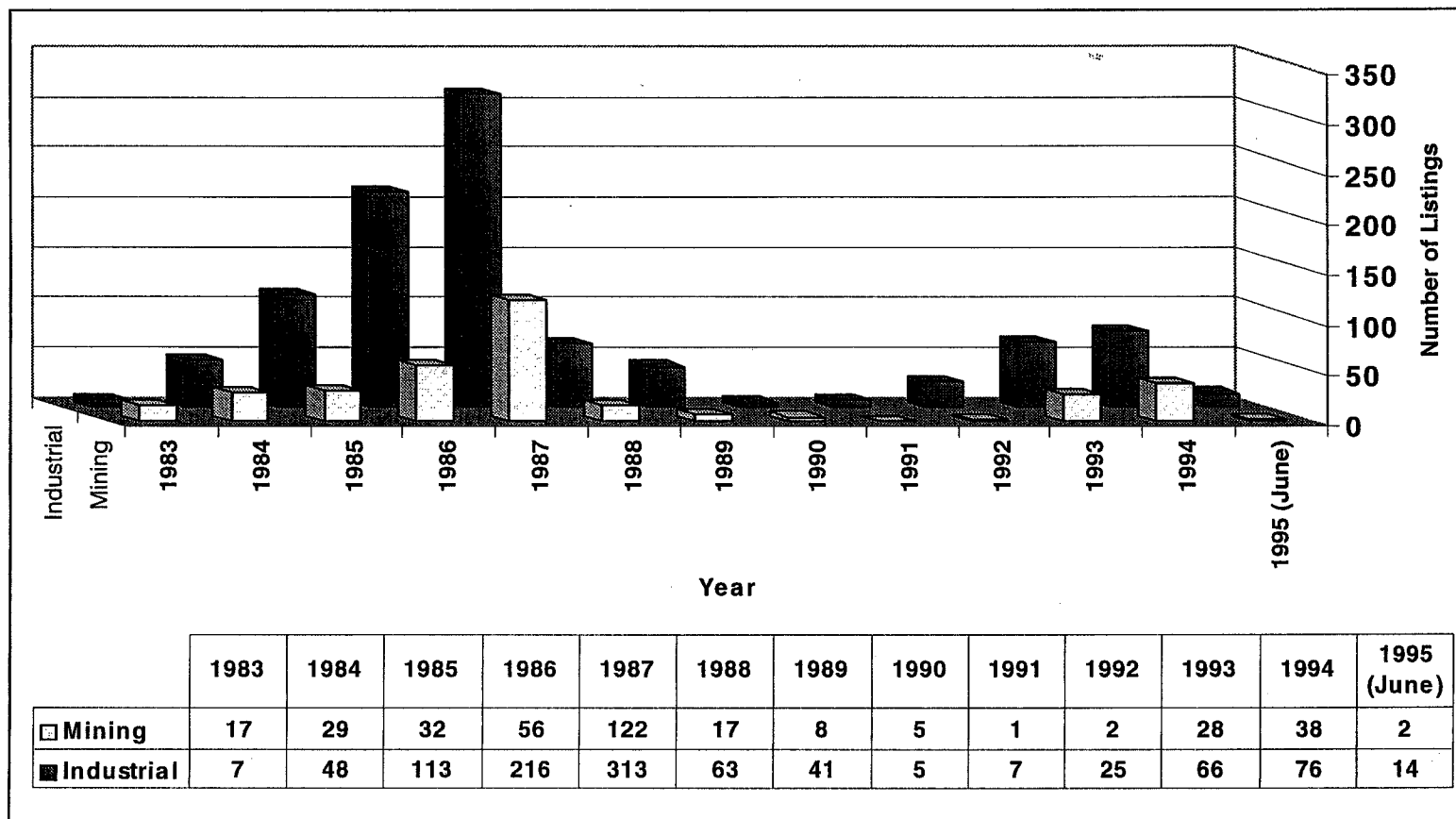
Figure 3.4 shows the yearly value of primary equity raised by the industrial and resource-based sectors. A similar pattern to that of Figure 3.3 is observed, but with more pronounced peaks. The industrial sector is responsible for over 77% of the total value of equity raised and accounts for 73.6% of the number of issues over the sample period.

Table 3.2 indicates the value of primary equity raised by industry sector. During the sample period, there was strong primary equity raising by entrepreneurial firms, gold and mineral explorers, and property trusts or REITs. Together, these three industry sectors account for 34.9% of the number of listings and 33.6% of the value of primary equity raised in the sample. Issues in the insurance and banking sectors are relatively larger, with average issue sizes of A\$147.8M and A\$133.7M respectively. While these outliers can be explained by distortions from privatisations, it is interesting to note that the 14 issues in these two sectors account for 12.5% of the total value but only 2% of the total number of issues in the sample<sup>15</sup>.

<sup>15</sup> This includes large issues raised by dominant insurance firms such GIO Australia (privatisation), SGI Insurance, FAI Life, CIC Holdings, MMI Limited and CE Heath International and banks such as Advance Bank and the Commonwealth Bank of Australia (privatisation).

**Figure 3.3 - Industrial & Resource Based Primary Equity Issues by Year (January 1983 - June 1995)**

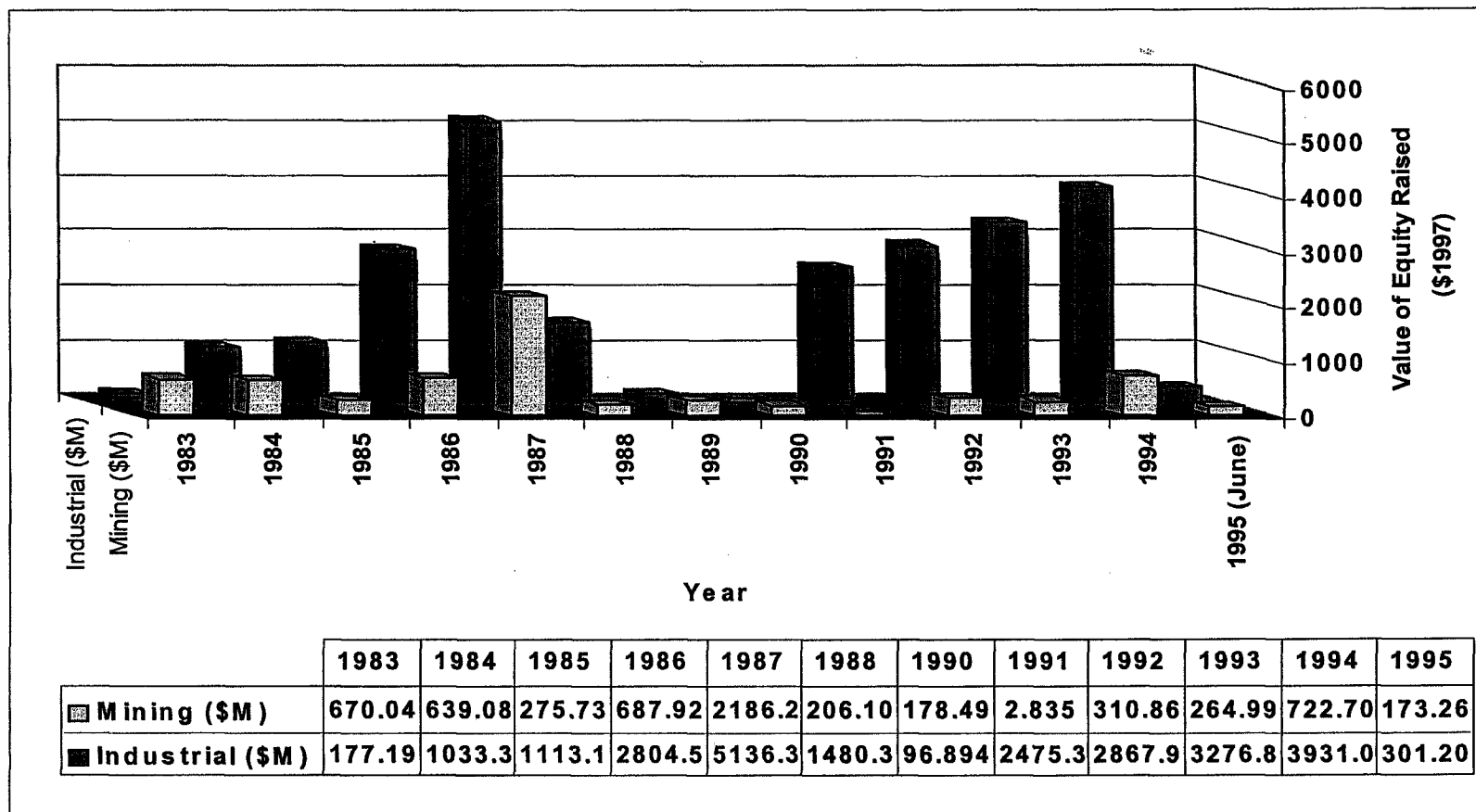
This figure shows the distribution of the sample of 1,351 primary equity issues from January 1983 - June 1995, segmented into industrial and resource based classifications. Altogether, the sample comprises of 1,351 issues categorised into 994 industrial and 357 resource based issues.



Source: Dissertation Database.

**Figure 3.4 - Value of Equity Raised by Industrial & Resource Based Primary Equity Issues by Year (January 1983 - June 1995)**

This figure shows the dollar value of sample of 1,351 primary equity issues raised from January 1983-June 1995, segmented into industrial versus resource based classifications.



Source: Dissertation Database.

**Table 3.2 Distributional Analysis of Primary Equity Issue Size by Industrial Classification (January 1983 - June 1995)**

Table 3.2 provides a distributional analysis of issue size by industrial classification for the sample of 1,351 new listings from January 1983 - June 1995. The mean, standard deviation, skewness and kurtosis measures relating to the distribution of issue size are shown.

Industry	Industrial Classification	No. Issues	Total Capital Raised \$97	%Value Raised	Average Issue Size \$97	SD.	Skewness	Kurtosis
Agricultural, Pastoral and Fisheries	232	21	337,895,719	1.07%	16,090,272	27,241,984	2.7370	7.2777
Alcohol & Tobacco	81-82	15	255,027,694	0.81%	17,001,846	18,250,377	2.5553	7.6624
Automobiles & Accessories	222	21	313,865,491	1.00%	14,945,976	29,147,272	3.7357	15.0461
Banking & Financial Institutions	150,161	14	1,871,212,382	5.95%	133,658,027	384,731,209	3.6934	13.7366
Base Metals	22,26	12	888,833,537	2.83%	74,069,461	109,970,439	1.4783	0.6975
Building Materials	52,71-74	25	170,489,764	0.54%	6,819,591	8,259,108	1.7083	1.8468
Chemicals	101-102	7	122,014,872	0.39%	17,430,696	23,465,594	1.1783	(0.6496)
Computer Services & Technology	215	58	459,273,830	1.46%	7,918,514	9,047,657	2.0594	4.7672
Engineering & Design	110-116	53	433,477,029	1.38%	8,178,812	13,342,643	3.7466	16.6708
Entrepreneurial	180-181,191-192	220	4,346,358,824	13.17%	19,756,176	56,041,746	8.4585	92.3011
Financial Services	195,202,203,226	20	1,333,314,292	4.24%	66,665,715	258,669,966	4.4523	19.8728
Food & Household	85,91-95	30	456,581,679	1.45%	15,219,389	48,074,871	5.2613	28.3201
Infrastructure & Utilities	52	3	30,581,545	0.10%	10,193,848	8,636,548	(0.1320)	n.c.
Insurance	172	14	2,068,900,266	6.58%	147,778,590	368,616,089	3.5404	12.8781
Media & Advertising	151-155,204	36	2,495,285,533	7.93%	69,313,487	267,824,850	4.0243	18.1934
Medical Services & Technology	217	34	792,857,222	2.52%	23,319,330	57,338,810	5.2687	29.3848
Mining - Gold & Mineral Exploration	12,13,14,15,18,19,23,25,27	216	3,682,743,459	11.71%	17,049,738	57,965,748	6.1071	39.1312
Mining - Other	50,51,53	91	514,781,964	1.64%	5,656,945	7,957,991	4.0333	19.7235
Miscellaneous Industrial	224,227,228	50	1,140,846,888	3.63%	22,816,938	57,251,574	3.5920	12.8879
Miscellaneous Services	211,213,214,216,219,221,231	59	624,362,632	1.99%	10,582,417	18,135,506	3.5719	14.0236
Oil, Gas & Coal	21,31-45	31	680,531,192	2.16%	21,952,619	32,354,762	3.2870	12.4796
Paper & Packaging	121-126	9	196,000,204	0.62%	21,777,800	31,375,979	2.1302	4.7447
Plumbing Supplies	57-58	5	13,465,889	0.04%	2,693,178	3,851,931	2.1658	4.7440
Property Development & Contracting	61-63,84,193	81	1,340,814,022	4.26%	16,553,260	36,656,729	3.7310	14.5850
Property Trust	201,212	35	2,719,957,541	8.65%	77,713,073	84,132,580	2.3996	8.2892
Real Estate & Consumer Finance	162	8	19,623,859	0.06%	2,452,982	2,894,927	1.9552	4.0839
Recreational Services	218,241	38	1,410,473,011	4.48%	37,117,711	120,743,447	5.4027	31.1813
Resource Investment	11,16,28,226	13	1,030,219,627	3.11%	79,247,664	143,816,093	2.2502	5.1613
Retail	130-134,170-171	42	860,225,898	2.54%	20,481,569	40,009,375	3.5295	12.6362
Technology	225,233,234	78	618,865,958	1.97%	7,934,179	14,792,069	4.9474	26.6959
Transportation & Warehousing	141-145	12	222,605,754	0.71%	18,550,479	20,427,893	1.2329	0.4252
<b>Total</b>		<b>1,351</b>	<b>31,451,487,574</b>	<b>100.00%</b>	<b>24,429,875</b>	<b>85,210,063</b>	<b>10.6351</b>	<b>146.6904</b>

Source: Dissertation Database.

KEY: n.c = not calculated

### **3.4.4 The Demand for Underwriter Services**

As discussed in Section 2.3.3, not all primary equity issues are underwritten in Australia. Table 3.3 provides an assessment of whether underwriting services were used when raising primary equity. This table shows the number of underwritten versus non-underwritten issues for the sample. 923 (68%) of the 1,351 issues in the sample clearly identify the name(s) of the underwriters, or make a statement indicating that the issue was not underwritten. There were several reasons why the underwriter may not have been identified. First, in the majority of cases where there was missing underwriter data, either the corporate directory references had excluded the information, or the microfiche containing corporate information was missing or illegible. This was particularly prevalent during the 1983-1988 period. Second, in the case of second board listings, an exhaustive search was undertaken to find as much historical data as possible on these firms. However, archival materials for second board listings is no longer held by the stock exchange and only limited data was available at the archival repository for ASX data (Company Paper Files) located at the University of Sydney.

To ensure consistency with the analysis in later chapters, the remainder of this discussion on the adoption of underwriters is confined to 837 primary equity issues where complete data was available (referenced in Chapter 5). An analysis of underwriter adoption by number and value is provided in Figures 3.5 (a) and 3.5(b). There are 699 underwritten issues (83.5% of the total) raising A\$17,250M (in 1997 dollars or 83.6% of the total). The total value of underwritten issues shown in Figure 3.5(b) is substantially higher A\$17,250M (in 1997 dollars or 83.6%), compared with A\$3,376M (16.37%) for non-underwritten issues. Moreover, the number of underwritten and non-underwritten issues exhibit the

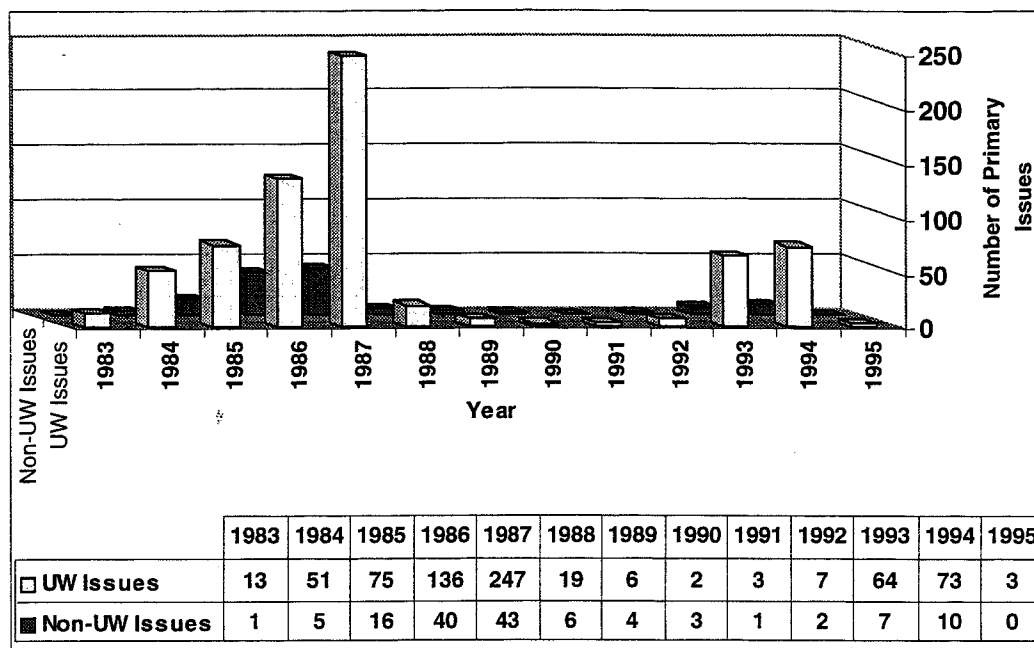
**Table 3.3 The Frequency of Underwriter Adoption (n=1,351)**

This table indicates the proportion of issues that were underwritten, non-underwritten and the number of issues in the sample where underwriter information was unavailable or missing.

Issue Type	Number	Percentage
Underwritten	871	64.47%
Not-underwritten	52	3.80%
Underwriter cannot be identified	428	31.68%
Total	1,351	100.00%

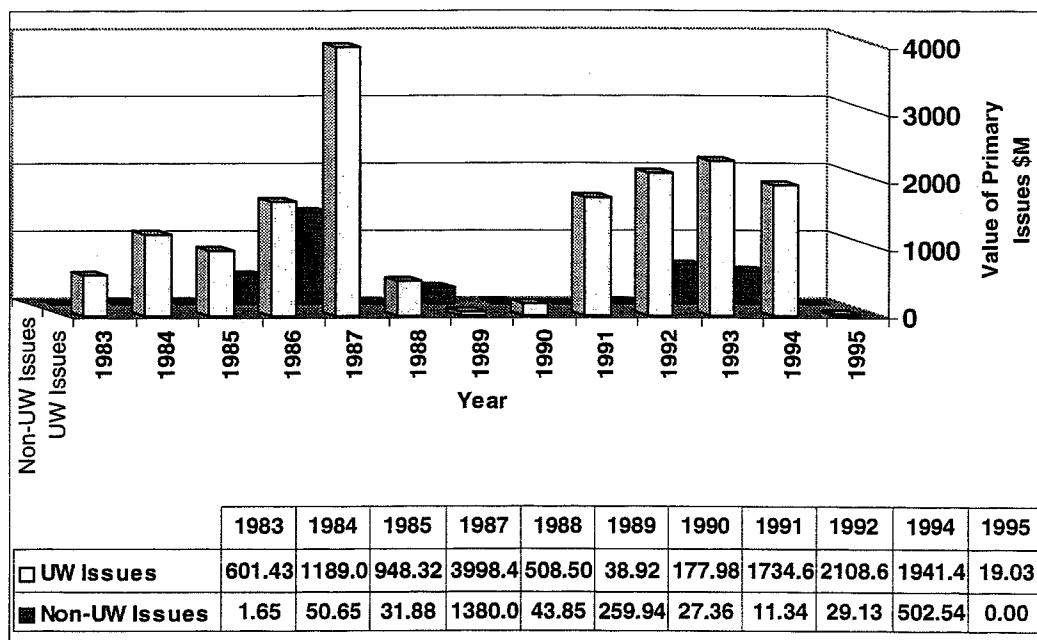
Source: Dissertation Database

**Figure 3.5 (a) - An Analysis of Underwriter Adoption in Primary Equity Raising : By Number**



Source: Dissertation Database.

**Figure 3.5 (b) - An Analysis of Underwriter Adoption in Primary Equity Raising : By Value**



Source: Dissertation Database.

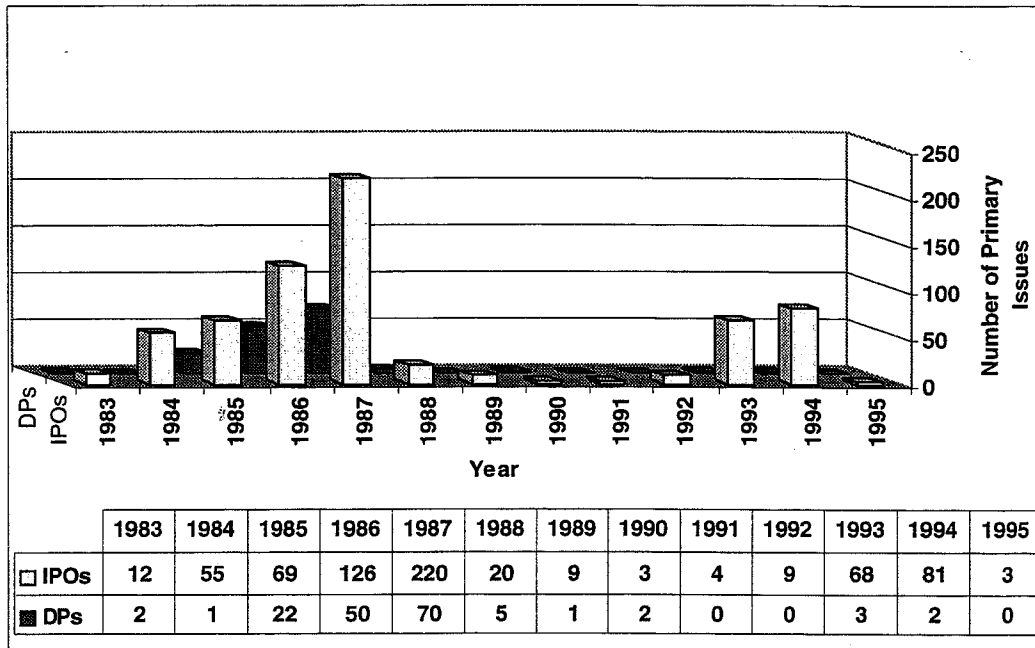


same overall pattern as Figure 3.3 which indicates the frequency of primary issues made over the sample period. Both the number of underwritten and non-underwritten primary issues reach a maximum in 1987.

#### **3.4.5 Distribution Method Choice**

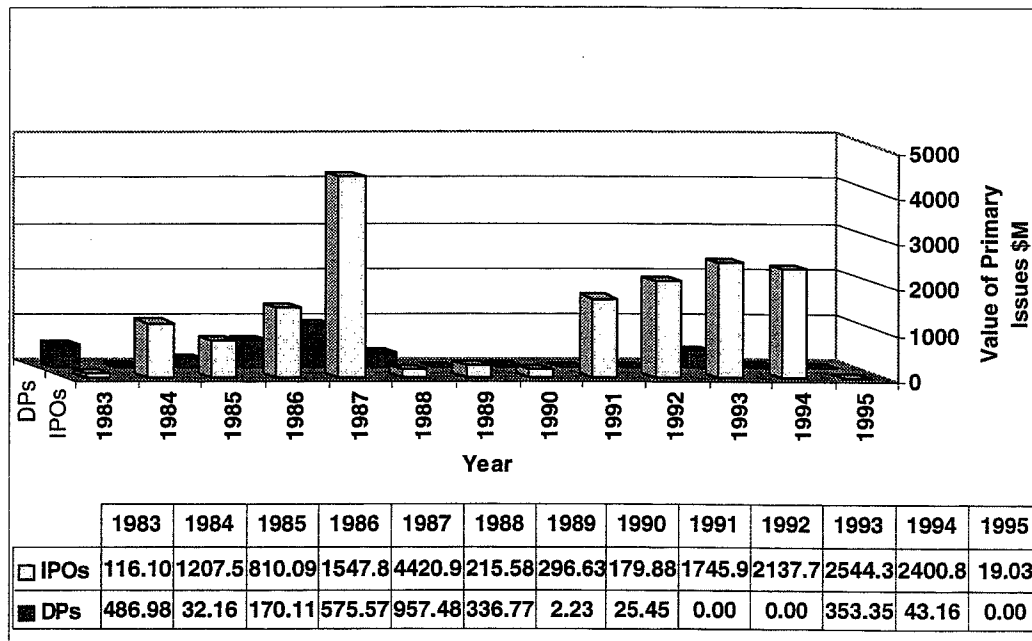
One of the main features of the database on primary equity issues is the inclusion of both initial public offers and direct placements. Consequently, Figures 3.6(a) and 3.6(b) provide an analysis of adoption rates for both distribution methods. The sub-sample of 837 primary issues, which is featured in the analysis of distribution choice in Chapter 5, comprises of 679 (81.1%) initial public offers and 158 (18.9%) direct placements, raising A\$17,643M and A\$2,983M (in 1997 dollars) of primary equity respectively. Over time, both distribution methods follow a similar pattern of adoption, although in 1991 and 1992, no direct placements were undertaken. Both distribution types peak in terms of the number and value of issues in the 1986-1987 period.

**Figure 3.6 (a) - Distribution Method Choice : By Number**



Source: Dissertation Database

**Figure 3.6 (b) - Distribution Method Choice: By Value**



Source: Dissertation Database.

### **3.4.6 Costs of Going Public**

The costs of going public can be categorised in terms of whether the costs are direct cost or indirect. Direct costs are incurred as a result of the process of raising primary equity and listing on the stock exchange. They represent an expense to the firm and are generally paid out of the funds raised from the issue or by the original vendor. Direct costs<sup>16</sup> include the costs of underwriting (often referred to as the gross underwriter spread) and other direct expenses (such as registration and listing fees, valuation and marketing fees, corporate advice, disclosure and printing costs, and legal and auditing fees and other ancillary expenses of the underwriter / merchant bank that are not included in the gross underwriter spread).

The other component of the costs of 'going public', the indirect costs, do not represent actual cash expenses, but are considered an opportunity cost because the issuing firm has lost a potential benefit. The deliberate underpricing of the issue, where the offer price is substantially less than the first trade price, is regarded as a significant indirect cost to issuers. In Section 3.4.6(a), an estimate of the direct costs of Australian primary equity raising is reported. A measure of the average gross underwriting spread is presented in Section 3.4.6(b), while in Section 3.4.6(c) the level of underpricing is considered.

#### **3.4.6(a) Total Direct Costs (Formation Costs)**

Total direct costs or 'formation costs' refers to the costs of issuing shares in the primary market and to costs associated with stock exchange listing. The efficiency with which primary equity funds are raised can be measured in terms of these direct costs of

<sup>16</sup> The terms 'formation' costs and 'flotation' costs are used interchangeably in Australia.

equity formation. For the 952 issues in the sample that reported formation costs (representing a disclosure of 70.5%), Table 3.4 provides an analysis of total direct costs per dollar raised disaggregated by issue size. The average cost per dollar raised is 7.88%<sup>17</sup> for all issues in the sample, with average formation costs for resource based issues of 8.86% and industrial issues of 7.44%. Table 3.4 also suggests that formation costs are inversely related to issue size with the cost per dollar raised varying from 1.79% of total funds received for the four large issues exceeding \$500M, to 9.71% for the 26 issues less than \$0.5M.

In contrast, Lee, Lochhead, Ritter & Zhao (1996, Appendix) report comparable statistics for a sample of 1,767 U.S. based IPOs over the period 1990-1994, where the interquartile range for total direct costs is estimated between 8.57-12.04% of the amount of equity raised. Further, a cost comparison of issues that are approximately the same average size as our sample ie. USD\$10-20M<sup>18</sup> indicated a range of total direct costs between 9.94%-12.44%.

<sup>17</sup> These estimates are consistent with the total direct costs for primary equity raisings in Australia reported in Ellis (1978, p152) estimated to be in the vicinity of 5% - 8% Ellis (1978) reports that the gross underwriting spread varied between 2.5% to 4% of the capital raised and that the other direct costs which include accounting and legal fees, prospectus preparation, printing, posting and corporate registration fees amounted to "a similar sum to the underwriting commission".

<sup>18</sup> The average issue size for the sample in this dissertation is A\$26M.

**Table 3.4 Analysis of Total Direct Costs (including Gross Underwriter Spread and Other Direct Costs)**

Issue Size (97 \$M)	Average Equity Raised (97 \$M)	Average Total Direct Costs per \$ Raised(%)	Number of Issues	% Number of Issues
0 - 0.499	0.320	9.71%	26	2.73%
0.500 - 0.999	0.734	9.64%	67	7.04%
1.000 - 1.499	1.162	9.42%	93	9.77%
1.500 - 1.999	1.648	8.70%	65	6.83%
2.000 - 2.999	2.342	9.03%	128	13.45%
3.000 - 4.999	3.693	8.83%	161	16.91%
5.000 - 7.499	5.728	7.70%	123	12.92%
7.500 - 9.999	8.388	7.08%	42	4.41%
10.000 - 19.999	13.400	6.09%	114	11.97%
20.000 - 39.999	26.811	5.31%	61	6.41%
40.000 - 59.999	47.020	5.60%	17	1.79%
60.000 - 79.999	67.311	5.06%	13	1.37%
80.000 - 99.999	85.599	4.95%	7	0.73%
100.000 - 499.999	188.001	3.91%	31	3.26%
> 500.000	987.184	1.79%	4	0.41%
Industrial Issues	21.140	7.44%	657	69.01%
Resource Issues	12.028	8.86%	295	30.99%
Total Sample	18.316	7.88%	952	100.00%

Source: Dissertation Database.

### **3.4.6(b) Gross Underwriter Spreads**

The average gross underwriting spread (or total underwriting fees divided by the total value of the issue) based on a sample of 862 issues is summarised by issue size in Table 3.5. The average gross underwriting spread is 3.717%. A breakdown based on issue size does not reveal any systematic variations in underwriter spread with issue size, with the exception that for the four largest issues the average gross underwriting spread is 1.932% based on an average issue size of A\$1,162.2M. As a test for variations in size, a comparison of the means for issue sizes less than A\$30M and more than A\$30M using the t-test is undertaken. The average formation costs for the 754 small sized issues is 3.765%, whereas for the 109 larger issues average formation costs are 3.389%. The t-statistic of 1.69 indicates that the average gross underwriter spread for smaller issues is statistically different from large issues at the 10% level. While, this finding is consistent with scale economies, the result is caused by the significantly large outliers with an issue size in excess of A\$500M influencing the mean. When these four observations are removed, there is no statistical difference in average gross underwriting spread across the size groupings. While size is often used as a proxy for risk [see Fama & French (1992, 1993, 1995, 1996, 1997a, 1997b)], the variation in spread across the size groupings is attributable only to a small number of outliers in the sample.

The stability of gross underwriter spread across issue size for this sample is contrary to the findings of How & Yeo (1999). They investigate a sample of 282 Australian industrial IPOs listing from January 1980 to January 1996, and report an average and median gross underwriter spread of 3.68% and 3.66% respectively. How & Yeo regress underwriter spread against firm specific risk factors and conclude that underwriter spread

**Table 3.5**  
**Average Underwriting Spread for Australian IPOs by Issue Size**  
**(January 1983-June 1995 : n=862)**

This table indicates the average underwriting spread for the sample segmented by issue size.

Size Range (A1997\$M)	Number of Issues	Average Issue Size (A1997\$M)	Average Gross Underwriting Spread%
0 - 9.99	608	3.273	3.861
10-19.99	106	13.500	3.538
20-29.99	40	23.485	2.894
30-39.99	22	32.952	3.565
40-49.99	11	43.133	4.560
50-99.99	35	65.584	2.927
100-500	36	206.409	3.535
500+	4	1,162.190	1.932
< \$30M	754	5.592	3.765*
\$30M or more	109	144.207	3.389*
Pre 1991	643	9.790	3.809
Post 1990	219	62.282	3.448
All Issues	862	23.126	3.717
KEY : * indicates significantly different at 10%			

Source: Dissertation Database.

can be explained by issue size. However, this result seems spurious as the dependent variable, underwriter spread is highly correlated with issue size by construction and the results of our analysis does not support a strong size influence, despite the fact that our sample includes resource-based issues.

Moreover, a test of gross underwriter spread differences before and after the change to the Corporations Law in 1991 reveals no statistically significant variation in underwriter spread across the two periods. This suggests that the impact of the regulatory changes had little effect on underwriter cost structure.

The overall level of underwriter spread in Australia is lower than that reported in North America where an apparent fixed 7% spread is observed in the U.S. [see Chen & Ritter (1999)] and a 6% spread (with some variation) is reported in Canada [see Rakita & Kryzankowski (1999)]. This lower gross underwriter spread suggests that Australian underwriters could be relatively more efficient. However, other plausible explanations for the higher fee structure found in the U.S. might be that underwriters in the U.S may provide ancillary services, such as analyst forecasts and recommendations and price support upon listing [see Rajan & Servaes (1997) and Ellis, O'Hara & Michaely (1999)], for which an additional charge is incurred. Alternatively, Hansen (1999, Abstract) alleges that in the U.S. "investment banks have colluded and fixed [underwriter fees] in an unprecedented fashion to profit from IPOs".



### **3.4.6(c) Underpricing**

As noted in Chapters 1 and 2, underpricing has been the focus of much of the prior research on the primary equity market. The distribution of the level of underpricing for all issues by industrial classification, is presented in Table 3.6. Based on the sample of 1,351 primary issues, the average level of underpricing is 41.32% with a standard deviation of 141.52%. The distribution is also characterised by positive skewness and fat tails. This apparent skewness and kurtosis appears to be induced by the resource, technology and entrepreneurial sectors. This table also provides an indication of the number of accurately priced and overpriced issues, defined as having a first trade price exactly equal or less than the offer price respectively. It appears that 923 issues (68.3% of the sample) are underpriced, 289 issues are overpriced (representing 21.4%) and 139 (representing 10.3%) issues are correctly priced.

The average level of underpricing by industrial sector is portrayed in Figure 3.7. Issues made by banks and financial institutions and by firms in the pastoral, mining and technology sectors are the most underpriced, whereas property trusts and low growth industrial sectors such as alcohol and tobacco, transportation, utilities and paper and packaging are the least underpriced. The average level of underpricing is significantly higher for the sample of 1,351 firms than reported in other Australian studies, as it includes firms with offer prices less than \$1<sup>19</sup>. The measurement of underpricing is distorted at

<sup>19</sup> See Table 2.2. The range in underpricing for Australian issues is 8.4%-36% with outlier observations reported in How (1995) of 107.12%. However, How (1995) includes implicitly assumed option values when calculating underpricing. How's empirical result is a direct result of methodological choice, as her sample of 130 mining stock largely consists of a common sub-sample of the 168 resource based listings in Suchard & Woo (1997). This latter study measures the level of underpricing via log price relatives and market adjusted simple returns of 21.1%.

**Table 3.6 - Distributional Analysis of Underpricing by Industrial Classification**

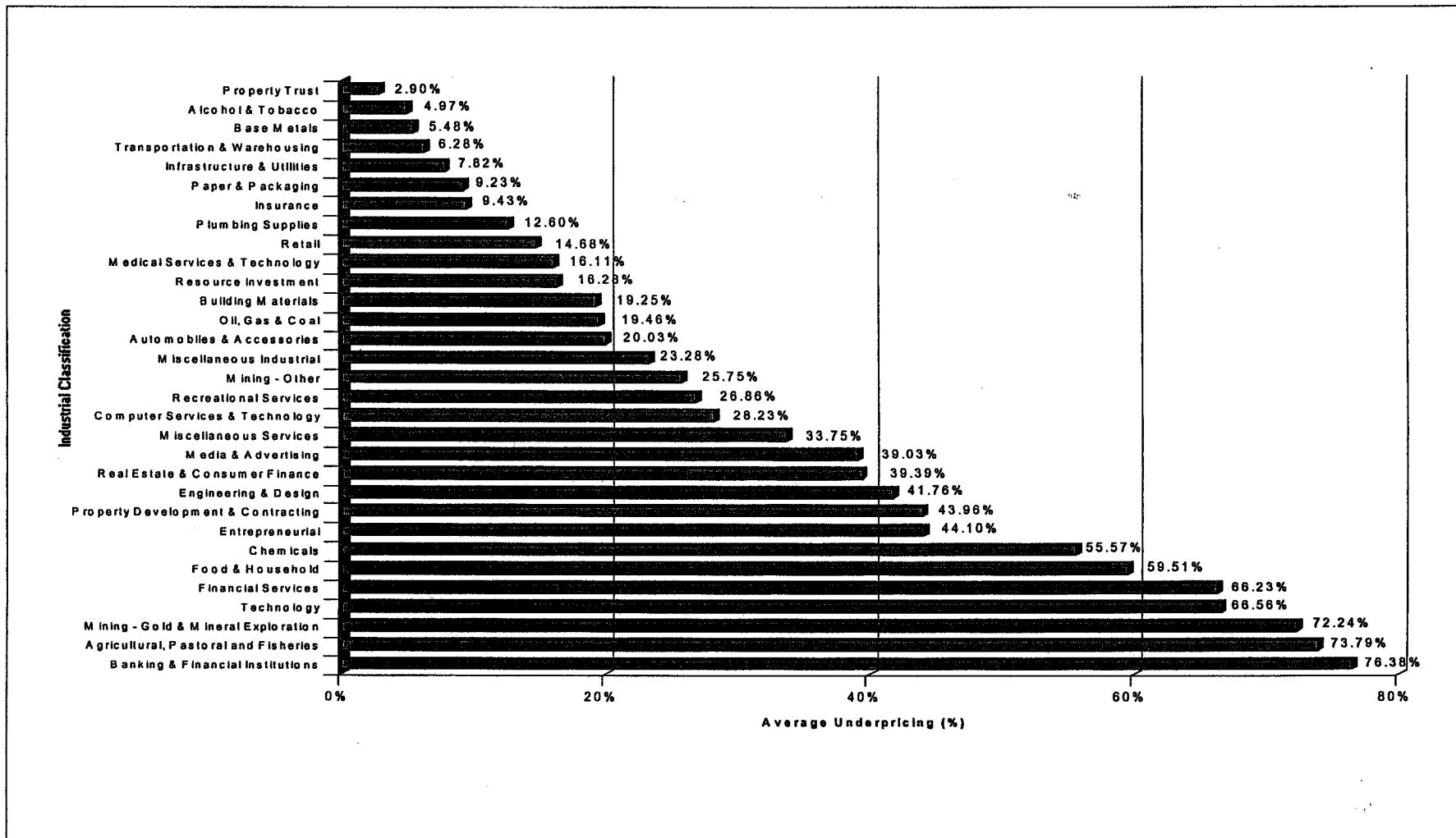
This table provides a distributional analysis of underpricing by industrial classification for the sample of 1,351 new listings from January 1983 - June 1995. The mean, standard deviation, skewness and kurtosis measures are presented along with the number of positive, zero and negative values for underpricing. Zero implies that the offer was priced in the secondary market to be the same as the offer price. Negative values imply systematic overpricing, where the value at the time the shares trade were less than the subscription price.

Industry	Average Underpricing	SD(upg)	Skewness	Kurtosis	Nobs(+ve)	Nobs(0)	Nobs (-ve)	%(+ve)	%(0)	%(-ve)
Agricultural, Pastoral and Fisheries	0.7378598	1.9448750	2.8887430	7.3967204	14	3	4	66.67%	14.29%	19.05%
Alcohol & Tobacco	0.0497067	0.2302071	1.1411306	2.0036191	7	3	5	46.67%	20.00%	33.33%
Automobiles & Accessories	0.2003192	0.5450007	3.6555522	14.6147507	15	4	2	71.43%	19.05%	9.52%
Banking & Financial Institutions	0.7638467	0.7658423	0.9940814	-0.2158640	13	0	1	92.86%	0.00%	7.14%
Base Metals	0.0547865	0.5117482	0.5665039	0.1071484	7	1	4	58.33%	8.33%	33.33%
Building Materials	0.1924849	0.4749756	3.2249747	13.9726540	18	4	3	72.00%	16.00%	12.00%
Chemicals	0.5557143	0.6169510	1.7564262	2.6830505	7	0	0	100.00%	0.00%	0.00%
Computer Services & Technology	0.2823305	0.5272622	2.1297440	4.7617190	41	6	11	70.69%	10.34%	18.97%
Engineering & Design	0.4175670	1.1975400	5.6853777	36.5168304	43	5	5	81.13%	9.43%	9.43%
Entrepreneurial	0.4409879	1.6970446	6.4579894	49.6463702	131	20	69	59.55%	9.09%	31.36%
Financial Services	0.6623414	1.3075948	2.4396338	5.2270841	16	1	3	80.00%	5.00%	15.00%
Food & Household	0.5950741	1.0555316	2.5921025	7.8726736	23	3	4	76.67%	10.00%	13.33%
Infrastructure & Utilities	0.0782456	0.0332261	-1.6832856	n.c.	3	0	0	100.00%	0.00%	0.00%
Insurance	0.0942560	0.1808014	1.9600766	5.0900212	9	2	3	64.29%	14.29%	21.43%
Media & Advertising	0.3903029	0.7249827	3.1537368	9.6622180	30	2	4	83.33%	5.56%	11.11%
Medical Services & Technology	0.1610769	0.3086353	1.3738003	5.2061917	25	4	5	73.53%	11.76%	14.71%
Mining - Gold & Mineral Exploration	0.7224303	2.3650593	6.5280193	52.5201780	137	14	65	63.43%	6.48%	30.09%
Mining - Other	0.2575210	0.6348573	2.2466499	6.2162038	45	15	31	49.45%	16.48%	34.07%
Miscellaneous Industrial	0.2328297	0.5520284	3.0495929	12.5580047	37	3	10	74.00%	6.00%	20.00%
Miscellaneous Services	0.3375200	0.6540623	2.9752715	10.6018786	46	7	6	77.97%	11.86%	10.17%
Oil, Gas & Coal	0.1945695	0.7770044	4.1650362	20.2258444	15	4	12	48.39%	12.90%	38.71%
Paper & Packaging	0.0923312	0.1675659	-0.1068087	-0.1922932	5	3	1	55.56%	33.33%	11.11%
Plumbing Supplies	0.1260000	0.1333417	1.570093	3.0283961	4	1	0	80.00%	20.00%	0.00%
Property Development & Contracting	0.4396080	1.1226990	5.2067558	32.9616227	68	6	7	83.95%	7.41%	8.64%
Property Trust	0.0290364	0.2012339	-0.2135861	1.6275187	19	7	9	54.29%	20.00%	25.71%
Real Estate & Consumer Finance	0.3938988	0.4983393	1.9144025	3.7333637	7	1	0	87.50%	12.50%	0.00%
Recreational Services	0.2685568	0.7355589	4.0508918	18.8778390	25	6	7	65.79%	15.79%	18.42%
Resource Investment	0.1627704	0.4215455	2.2455099	6.6790878	6	3	4	46.15%	23.08%	30.77%
Retail	0.1467937	0.2161091	0.8768371	6.8401402	35	4	3	83.33%	9.52%	7.14%
Technology	0.6656064	1.9989332	6.9050565	54.6512671	64	4	10	82.05%	5.13%	12.82%
Transportation & Warehousing	0.0627614	0.1152671	-0.7951156	1.1548790	8	3	1	66.67%	25.00%	8.33%
<b>Total</b>	<b>0.4131974</b>	<b>1.4151838</b>	<b>8.5820261</b>	<b>101.5087118</b>	<b>923</b>	<b>139</b>	<b>289</b>	<b>68.32%</b>	<b>10.29%</b>	<b>21.39%</b>

Source: Dissertation Database.

KEY: n.c = not calculated

Figure 3.7 - The Level of Underpricing by Industrial Classification (January 1983 - June 1995)



Source: Dissertation Database.

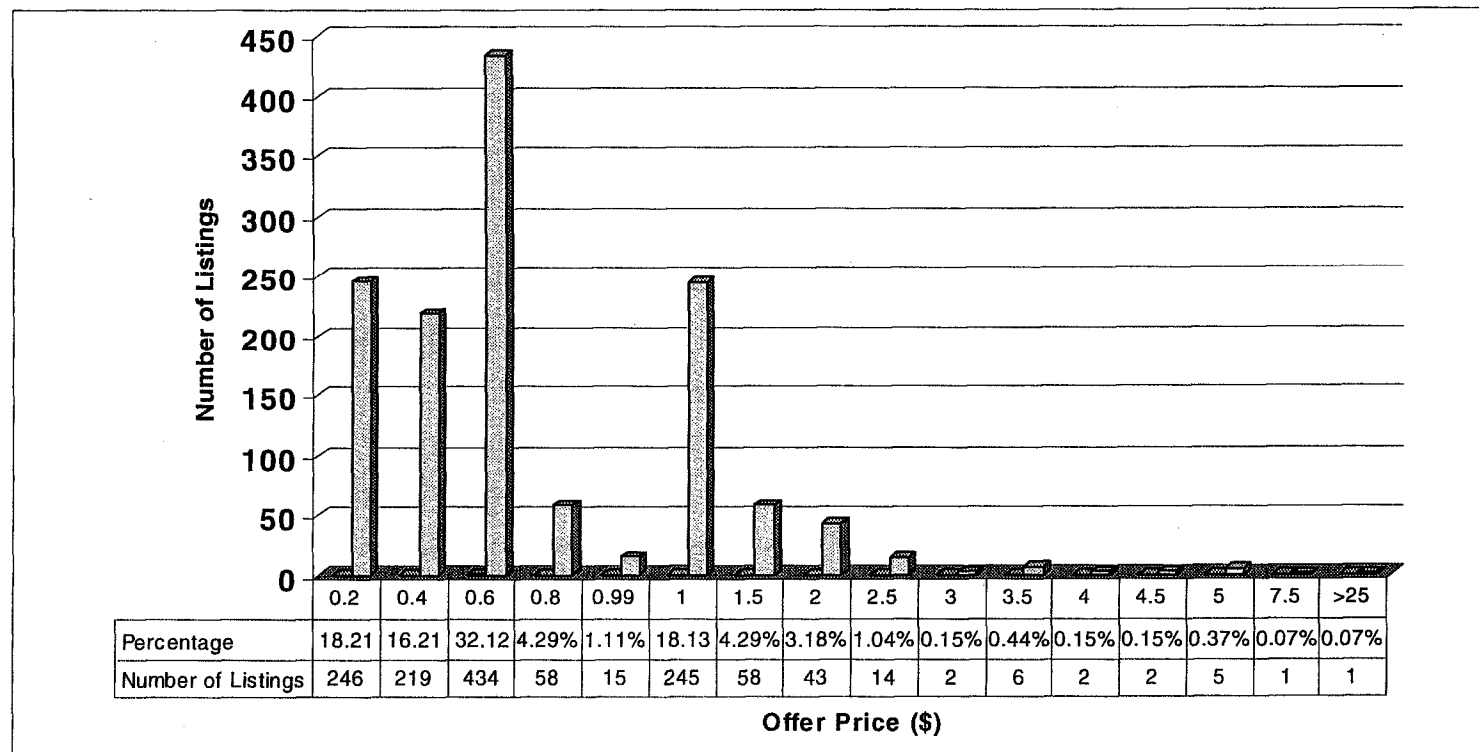
small offer prices<sup>20</sup>. Thus, the level of underpricing for the sample is 14.59% when the 972 (71.95%) listings with an offer price of less than \$1 are excluded from the calculation. The distribution of the sample by offer price is displayed in Figure 3.8. While most prior IPO literature ignores smaller issues, in this sample A\$7,620M (in constant 1997 dollars) was raised by issues with offer prices less than \$1, accounting for 24.2% of the total raised.

The distribution and range of underpricing over time is depicted in Figure 3.9. The height of the vertical line shows the monthly range in underpricing for the sample (measured as per equation 2.3), while the average level of underpricing is displayed as a darkened dash. Extreme ranges in underpricing are evident in periods with high market volatility, represented in Figure 3.10 by the average daily market return and volatility of the All Ordinaries Accumulation Index. Indeed, the average monthly level of underpricing is significantly positively correlated with monthly market returns (0.384), the number of new listings per month (0.292), and the standard deviation of monthly market returns (0.155). In brief, this database is consistent with general findings in other countries that underpricing is highly serially dependent [see Ibbotson & Jaffe (1975)], and that this dependence is related to the level of market ebullience. Moreover, as in the U.S., resource based and speculative issues are more underpriced than industrial issues [see Ritter (1984)].

<sup>20</sup> This aspect is briefly considered in Appendix VI which provides a graphical analysis of the likely effect of a 10c, 25c and 50c discount on true worth on underpricing (as measured by equation 2.3). One can see from this graph that the relationship between underpricing and offer price is highly non-linear with extremely large underpricing being recorded where offer prices are very low and less than one. The magnitude of the relationship is more pronounced for higher discount values.

**Figure 3.8 - Distribution of Offer Prices**

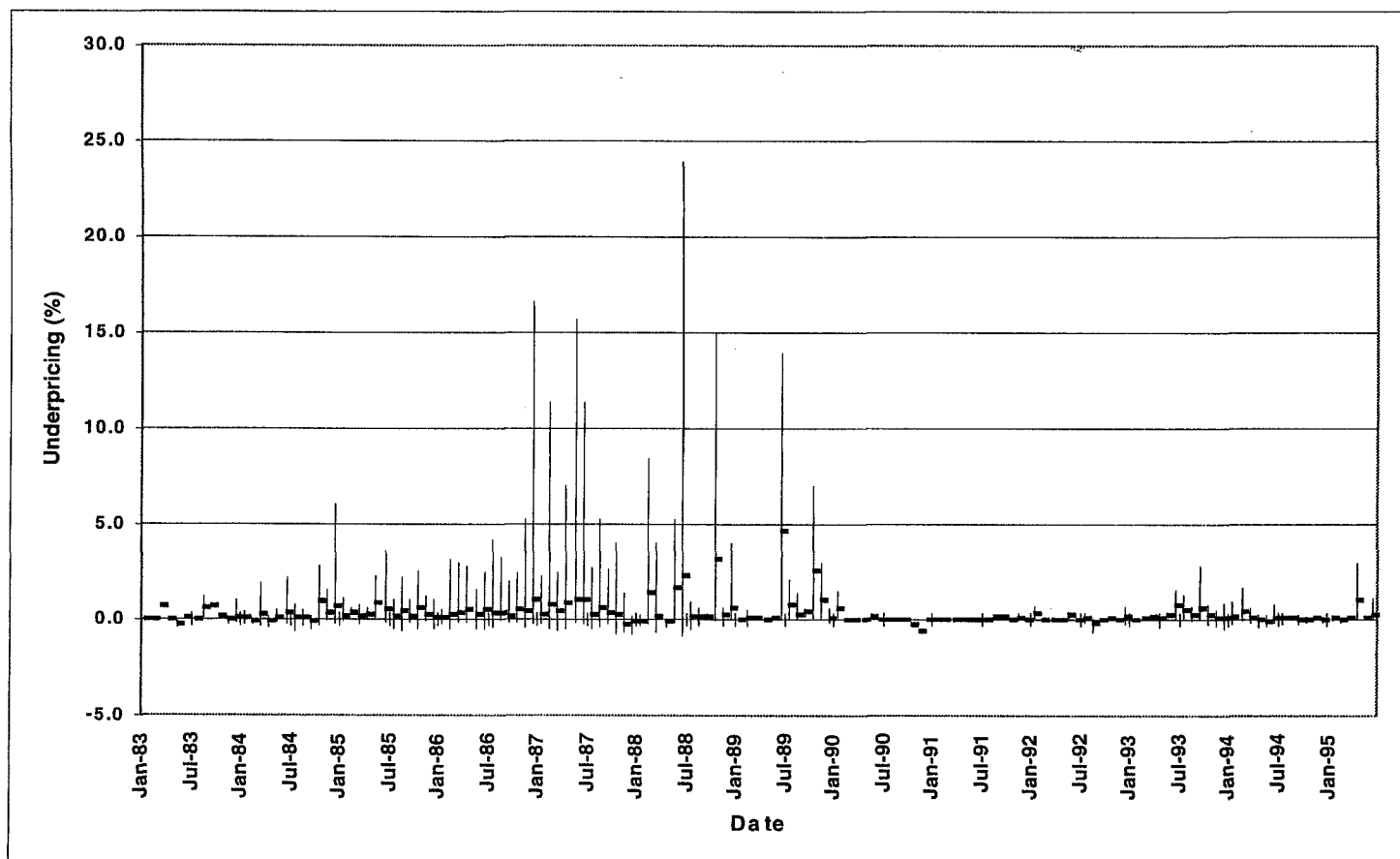
The distribution of offer prices is highly negatively skewed for sample of 1,351 issues. This is of great concern when measuring underpricing as offer prices less than \$1 distort the measurement of first day returns. In terms of the relative importance of this characteristic, 972 issues with an offer price less than \$1 (71.95% of the sample) raised A\$7.617 billion (in 1997 dollars) which is 24.2% of the total constant dollar value raised. The remaining 379 issues (28.05% of the sample) with an offer price equal to or greater than \$1 raised A\$23.834 billion (in 1997 dollars).



Source: Dissertation Database.

**Figure 3.9 - Monthly Range of Underpricing (January 1983 - June 1995)**

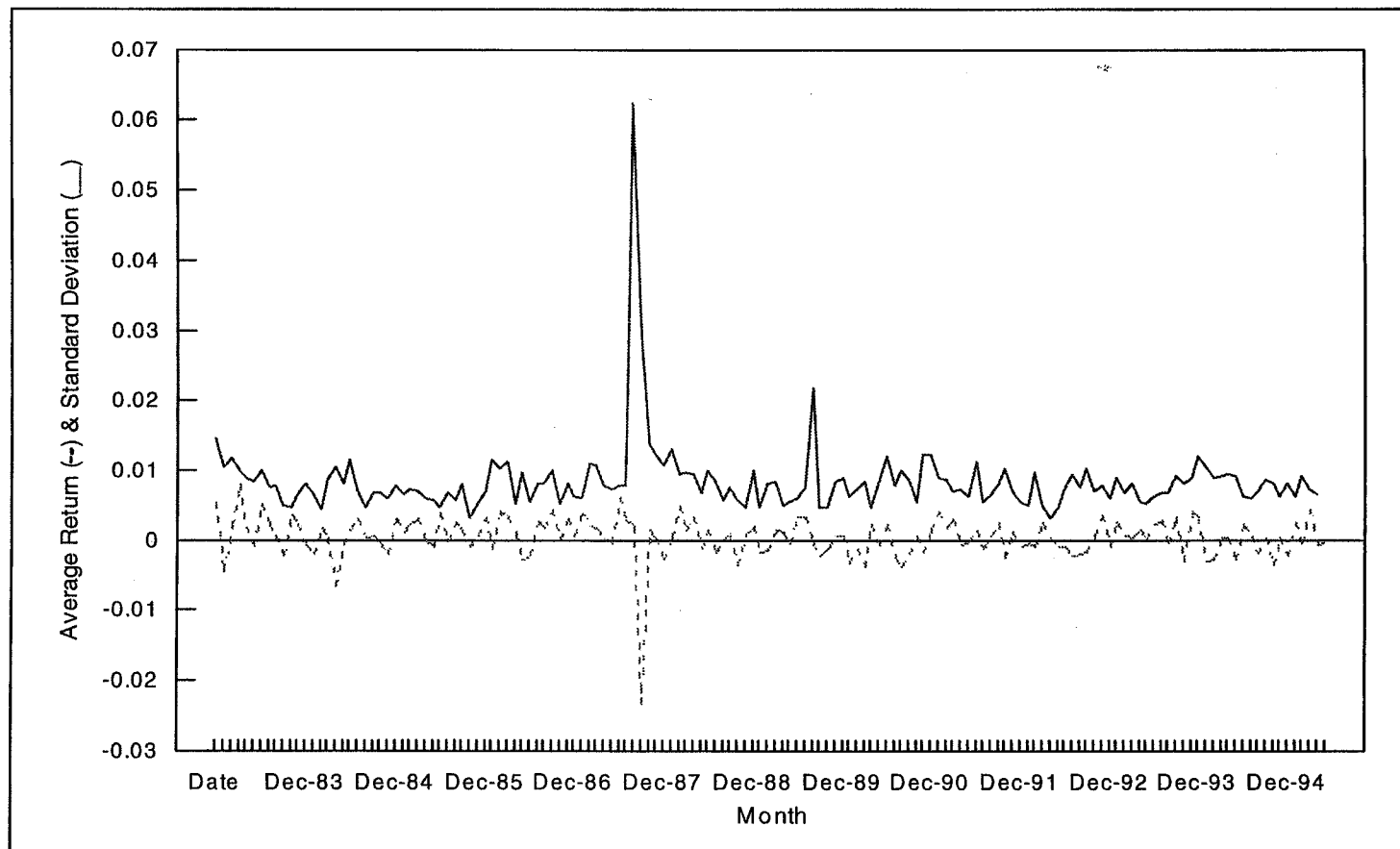
This figure shows the range of underpricing levels by month over the sample period - January 1983 - June 1995. The vertical line shows the range in underpricing in a given month and the average level of underpricing is indicated by the horizontal marker.



Source: Dissertation Database.

**Figure 3.10 Average Market Return and Volatility Per Month - All Ordinaries Accumulation Index (1983-1995)**

For each month, the average return and the volatility of the general market index is calculated using daily data.



Source: ASX Statex Database.

### **3.4.7 Participants in the Primary Equity Market**

#### **3.4.7(a) Underwriters**

The degree of competition in underwriting has a significant impact on the industry as the degree of power individual underwriters hold affects pricing and contracting decisions, as well as the extent to which customers (issuing firms) are serviced. Higher levels of industry concentration are associated with greater relative power of an underwriter. This implies that underwriters are not perfect substitutes. Recognition of underwriter heterogeneity is important to a study primary issues if it is believed that powerful and high reputation underwriters provide better service and information, and contribute to the allocational efficiency of the stock market [see Beatty & Ritter (1986), Booth & Smith (1986), Carter & Manaster (1990) and Carter, Dark & Singh (1998)]. Underwriter reputation enters this analysis when the determinants of distribution choice are analysed in Chapter 5. Consequently, the main participants in underwriting activity are listed in Table 3.7.

Table 3.7 underwriter participation is proxied by the dollar value of issues taking into account the following assumptions. First, it is assumed that if there is more than one underwriter, the share of underwritten activity is divided equally amongst the underwriters. While this procedure may introduce some biases (in the sense that participation rates may not be equal<sup>21</sup>), the absence of information concerning sharing arrangements precludes a better approach. Second, for each underwriter, the total dollar value underwritten is determined as the sum of each individual fraction of issues the underwriter participated in.

<sup>21</sup> This bias is unlikely to be severe as 72% of all underwritten issues involved one underwriter.



**Table 3.7 Underwriter Participation**

This table indicates the relative proportion of underwriting activity by the Top 10 underwriters ranked by the dollar value of issues underwritten. Where issues were jointly underwritten it was assumed that the underwriting activity was shared equally.

Top 10 Underwriters	Ranked by Value of Issues Underwritten
JB Were & Sons (JBW, WER)	11.11%
Ord Minnett Limited (ORD, OMS)	9.14%
County Natwest Securities (COV)	5.78%
McIntosh Hamson Hoare Govett (MHH)	5.17%
Potter Warburg Capital Markets (POT, POW)	3.32%
Bain & Company (BAI)	3.23%
BT Securities (BTC)	3.10%
AC Goode (ACG)	2.83%
Macquarie Underwriting (MUW)	2.76%
CS First Boston (CSF)	2.18%
Total Based on Top 10 Underwriters	48.62%

Source: Dissertation Database

As an indication of underwriter concentration, the top 4 underwriters collectively participate in 31.2% of all underwriting activity (representing a total value of A\$17,250M), and the 10 largest underwriters are involved in 48.62% of the underwriting activity. Overall, this data does not suggest that the underwriting industry is particularly concentrated. U.S. evidence reported by Hansen (1999, Table 3) suggests that the U.S. underwriting market is more concentrated, as the top 4 investment banks for the period 1983-1996 were involved in 29% in 1983 to 69% in 1988 of the underwriting deals by value. The average yearly market share over the 13 year period was 49%.

#### **3.4.7(b) Auditors & Investigating Accountants**

There were 101 separately listed and identifiable accounting firms or auditors supporting primary equity issues over the investigation period. At the start of the sample period, the largest accounting firms are collectively referred to as the 'Big Eight'<sup>22</sup>. During the sample period, this group of accounting firms consolidated to the 'Big Six' and were engaged as auditor and/or investigative accountant in 66% of the sample of 1,351 primary issues. This is comparable to the 65.8% participation rate of Big 6/8 auditors reported in Lee, Stokes, Taylor & Walter (1999, Table 1) that covers a sample of 266 Australian industrial IPOs over the period 1976-1989. In establishing the involvement of an auditor in the issue documentation, issuing firms sometimes made a distinction between the auditor and an independent accountant. This dichotomy is not imposed by way of legal distinction, but rather by the accounting firm themselves. It seems from inspection that an investigating accountant is involved in the preparation of an expert type report which includes some view

<sup>22</sup> A ranking of Australian audit firms is provided in Appendix VII.

on the future profitability of the firm (forecasts)<sup>23</sup>.

The participation rate of auditors in the preparation of issue and listing documentation, classified into Big 6/8<sup>24</sup> and non-Big 6/8 for the sample of 837 primary issues featured in Chapter 5 with complete information, is illustrated in Figure 3.11. Overall, this figure shows that the Big 6/8 firms dominate the primary equity market. They are involved in 583 (69.7%) of the 837 issues. In 1987, the year with the highest number of primary issues, Big 6/8 auditors were involved in 67.93% of 290 issues. However, after the October 1987 stock market crash, there was a major decline in the number of primary issues and an apparent flight to quality audit certification in 1988, where Big 6/8 firms were involved in 80% of primary issues.

### **3.4.7(c) Bankers**

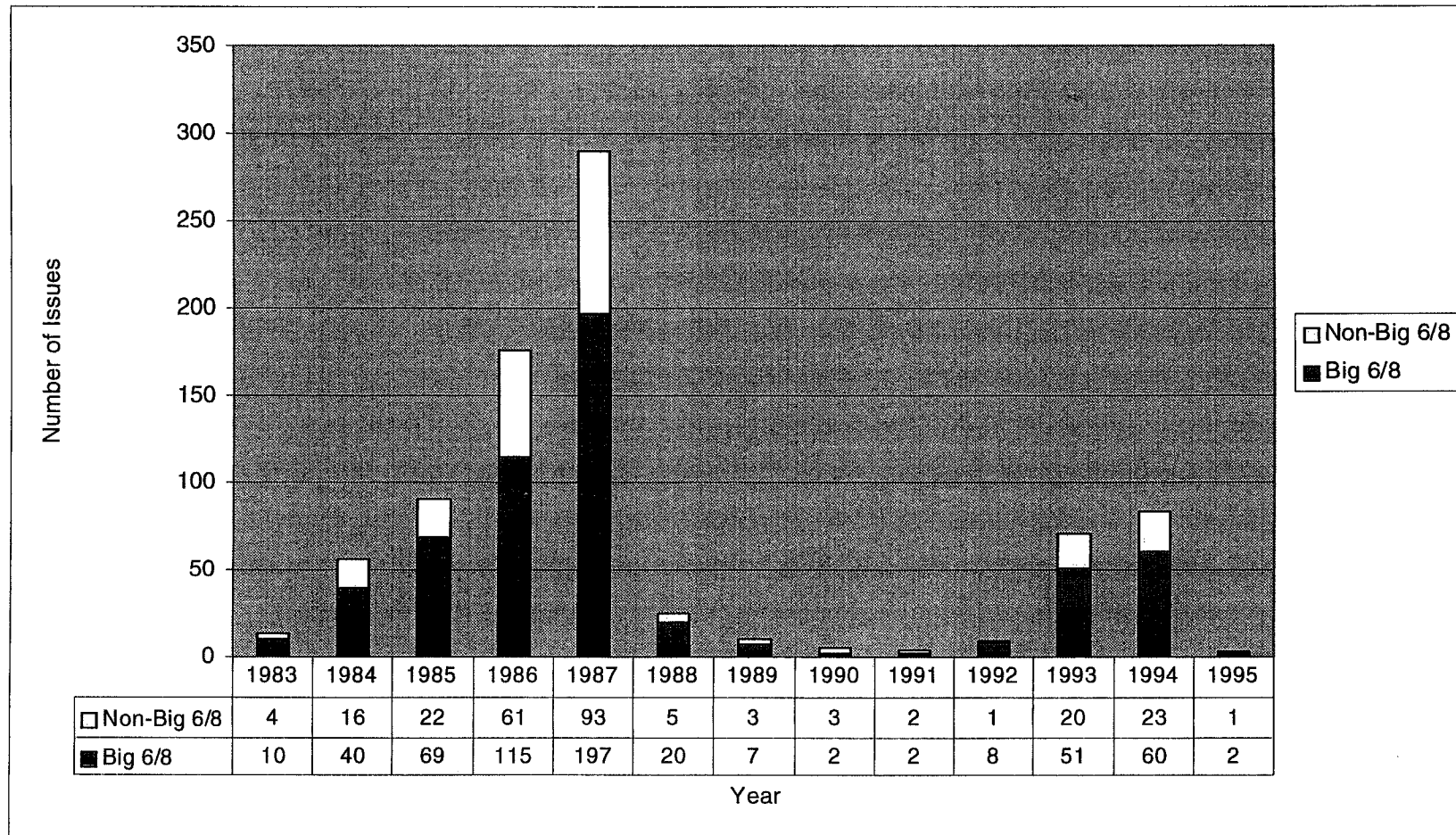
Empirical evidence from the United States suggests that the existence of a credible and established banking relationship is a signal of issuing firm quality [refer to James & Weir (1990), James (1992), Slovin & Young (1990), Diamond (1991), Petersen & Rajan (1994) and Aggarwal & Leal (1996)]. While the duration of the bank relationship is not known for the IPOs in the sample, this dissertation identifies (where disclosed) the bank with whom the issuing firm has established a relationship. This banking relationship was

<sup>23</sup> Auditing Standard 904 [Issue 10, Revision 95] suggests that an auditor should be governed by ethical principles in relation to "independence, integrity, objectivity, professional competence and due care, confidentiality, professional behaviour and technical standards" (item 7). The auditor should carry out procedures agreed upon and use evidence obtained as the basis for the report of factual findings. Such procedures may include: "inspection, observation, inquiry and confirmation, computation and analytical procedures". In many cases, the auditor and independent accountant maybe related.

<sup>24</sup> Note that because of the various name changes all subsumed entities of the now 'Big-Five' accounting entities have been recorded according to their business name at the time of the issue.

**Figure 3.11 - Participation Rates of Big 6/8 vs. Non-Big 6/8 Auditors in Primary Equity Issues (January 1983 - June 1995)**

Based on the sample of 837 primary issues used in Chapter 5, this figure shows the participation rates of auditors classified according to whether they are Big 6/8 or non-Big 6/8 firms.



Source : Chartac Rankings and Dissertation Database.

identified from the prospectus, or the *ASX Company Review Service* or *Jobson's Year Book* within the year of listing. For the sample of 837 primary issues, Westpac Banking Corporation is the relationship retail bank for 24% of the sample of primary issues, ANZ Bank 22%, National Australia Bank 20%, the Commonwealth Bank of Australia is involved with 11% of primary issues, and the remaining banks 12%.

#### **3.4.7(d) Legal Profession**

A breakdown of legal firms has not been provided because of the very large number of independent legal institutions and partnerships involved in primary issues. However, there were 367 independent legal practices involved in the sample. Legal firms with the greatest market share based on the number of primary issues include (based on a sub-sample of 1179 issues that reported legal advisors): Freehill, Hollingdale & Page (5.42%), Phillips Fox (4.83%), Mallesons, Stephen Jacques (4.58%) and Clayton Utz (4.58%).

### **3.5 Conclusion**

This chapter has described the primary equity issue database that was created for the purposes of the dissertation. Descriptive statistics associated with various aspects of the primary issuance process have been presented. In particular, the volume and value of gross proceeds raised, the costs of the going public (including a discussion of formation costs, gross underwriter spreads and underpricing) and participants in the primary equity market have been examined. In subsequent chapters, observations from the database are used to examine the determinants of the demand for underwriting services (Chapter 4) and the choice of distribution method for primary equity (Chapter 5).

## CHAPTER 4

### THE DEMAND FOR UNDERWRITING SERVICES FOR PRIMARY EQUITY

#### 4.1 Introduction

Little research has been published on the determinants of the demand for underwriting services within the context of primary equity formation<sup>1</sup>, whereas considerable research has examined the choice of debt type and contract terms in the debt market. In this chapter, a model of the demand for primary underwriting services is proposed that primarily draws from theories of financial intermediation in the debt market literature. Such theories are based upon transaction cost, information asymmetry (including growth opportunities), firm reputation, liquidity, and risk transfer/avoidance explanations. However, this literature is supplemented by predictions drawn from the theory of optimal security design and empirical evidence derived from the equity issuance literature. These propositions are empirically tested using logit regression analysis.

In an imperfect capital market without financial intermediaries, the potential for funds to flow between principals (lenders) and agents (borrowers) is fraught with disincentives introduced through agency relationships. Under such conditions, it is difficult

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<sup>1</sup> Prior research examines a variety of issues concerning underwriter decisions but has ignored the question of how an issuer of primary equity determines whether or not it should engage an underwriter. An exception is the theoretical work of Chemmanur & Fulgheri (1994) that provides some testable implications for the present analysis. Analysis of self-underwritten IPOs has been undertaken by Chen & Lin (1996) following from the stream of literature which investigated the role of venture capital in the creation of new equity [see Barry, Muscarella, Peavy & Vetsuypens (1990) and Saunders & Lim (1990)]. However, Chen & Lin limit their sample to issues where the lead underwriter holds an equity stake. In this study, no such restriction is imposed. The underwriting decision has been examined in relation to seasoned equity offerings by Smith (1977). In this research, Smith concludes that the "use of underwriters appears to be inconsistent with rational, wealth maximising behavior by the owners of the firm"(p 273).

to specify an incentive compatible contract between principals and agents that negates the moral hazard problem associated with the non-observability of actions (hidden action) and information (hidden information), or incomplete information (adverse selection) [see Smith & Warner (1979), James & Smith (1994, pp119-122), Easley & O'Hara (1988) and Rasmusen (1990, p133-221)]. Financial intermediaries provide an efficient approach for the resolution of these problems<sup>2</sup>.

Even though the main focus of the model development in this chapter rests upon theories of financial intermediation, research examining the role of underwriters in both primary and secondary equity issuance<sup>3</sup> is also considered. While few papers have concentrated on the underwriting decision specifically, elements of this decision are considered in Smith (1977), Barry, Muscarella, Peavy & Vetsuypens (1989, 1990) and Chen & Lin (1996). Thus, Smith (1977) finds, in the context of seasoned equity issues, that underwritten issues are far more costly than rights issues, yet appear to be used more frequently. This observation is referred to as the 'equity financing paradox' [see Hansen & Pinkerton (1982)]. The research focus of Barry, Muscarella, Peavy & Vetsuypens (1989, 1990) is the role performed by venture capitalists in primary equity formation, particularly in respect to monitoring, certification and information asymmetry. Finally, Chen & Lin (1996) examine 'self-underwritten' issues when the underwriter also holds an equity stake

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<sup>2</sup> Theories of financial intermediation have been widely applied to retail banks, acknowledging the special role that banks play in debt markets [for example, see Diamond (1984, 1991), Sharpe (1990), Rajan (1992), James & Smith (1994) and Puri (1995)].

<sup>3</sup> Underwriting contracts often call for the underwriter to carry out one, or perhaps multiple economic functions. The underwriter can be called upon to underwrite (guaranteeing funds raised), advise, price and distribute the offering. These perspectives are consistent with a certification role [see Booth & Smith (1986) and Eckbo & Masulis (1992)] where the extent of any remaining information asymmetry manifests itself in the stock's post-listing price performance. Only the underwriting function of the investment bank in the primary equity market is considered in this chapter.

in the issuing firm.

The remainder of the literature, while not directly focused upon the demand for primary equity underwriting, frequently refers to the role of underwriters in terms of *optimal risk sharing and the choice of contractual form (firm commitment vs. best efforts)* [see Mandelker & Raviv (1977), Baron (1979, 1982), Baron & Holmstrom (1980) and Sherman(1992)], *underwriter price support* [see Ruud (1993), Hanley (1993), Hanley, Kumar & Seguin (1993), Asquith, Jones & Kieschnick (1995), Chowdhry & Nanda (1996), Beneveniste, Erdal & Wilhelm (1998) and Ellis, O'Hara & Michaely (1999)], *underwriter reputation* [see Beatty & Ritter (1986), Johnson & Miller (1988), Ibbotson & Ritter (1995), Chemmanur & Fulgheri (1994), Nanda & Yun (1997) and Dunbar (1998, 2000)], *strategic offer price formation and allocation mechanisms when underwriters are used* [for example, Rock (1986), Benveniste & Spindt (1989), Hanley & Wilhelm (1995) and Benveniste & Busaba (1997)], *the optimal selling strategy when distributing securities via cascades* [see Welch (1992)], *optimal ownership structure* [see Booth & Chua (1996), Stoughton & Zechner (1998) and Mello & Parsons (1998)], *the structure of underwriter's fees* [see Chen & Ritter (1999), Kryzankowski & Rakita (1999) and Altinkilic & Hansen (1999)], *the benefits from underwriter syndication* [see Hansen & Khanna (1994) and Pichler & Wilhelm (1999)], and *the provision of analysts' recommendations* [see Womack (1996), Rajan & Servaes (1997) and Jain & Kini (1999)]. Consequently, the implications of this research is considered when developing the hypotheses.

The structure of the chapter is as follows. Section 4.2 examines the similarities and differences in financial intermediation that exist between the role of banks in the debt



market and the role of underwriters in the equity market. In particular, the level and frequency of monitoring is considered together with its implications for underwriting in equity markets. Section 4.3 then reviews the testable propositions derived from the financial intermediation/equity issuance literature that impact on the demand for equity underwriting services for primary equity issues. A description of the model and variables used is presented in Section 4.4, while the results of the logit regression are reported in Section 4.5, and, overall conclusions are drawn in Section 4.6.

## **4.2 Monitoring and Financial Intermediation**

### **4.2.1 Features of Debt and Equity Markets**

Before reviewing explanations for financial intermediation that dominate the debt-choice literature and applying them to a model of an issuing firm's demand for underwriting services in equity issuance, it is useful to examine the main features of debt and equity securities/markets. Common to both markets is their ability to improve the flow of funds between deficit and surplus entities in the economy. However, the main distinctions between equity and debt markets relate to inherent differences in security type and the agency problems generated. These affect the frequency and level of monitoring activity required to resolve the agency issue(s).

A debt security can be characterised as a contractual arrangement where the lender receives a fixed schedule of payments (usually interest payments and a proportion of the principal)<sup>4</sup> for a pre-specified period<sup>5</sup>. On-going monitoring activity by the lender forms

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<sup>4</sup> It is also possible for an interest only loan where the principal is paid at maturity.

<sup>5</sup> Most loan contracts are drafted for a fixed and finite period of time and need to be renewed on a periodical basis.

the basis of the contract renewal or re-negotiation, with the frequency of monitoring activity being directly related to the length of the contract period. Differential debt types and the need for continual re-assessment give rise to significant resources being devoted to credit rating facilities that attempt to systematically rank debt securities against each other and across time.

In contrast, equity securities involve ownership with security holders agreeing to take on the risk of the venture for the potential payment of an uncertain reward as residual claimants on the firm. Equity securities are perpetual, in that they do not expire unless the firm ceases as a going-concern. Monitoring activity is less formal in equity markets, and involves the periodical disclosure of financial position and profitability to shareholders to fulfil the basic requirement for accounting stewardship. Also, comparative performance of different equity securities is undertaken by stockbrokers and investment banks. This takes the form of analyst recommendations<sup>6</sup> that are essentially third party assessments of medium to long term dividend yields and capital gains.

The management of agency costs in debt markets is important to reduce the potential mis-allocation of resources. In attempting to maximise shareholder wealth, managers<sup>7</sup> may make decisions that are sub-optimal for debt holders in terms of *claim*

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<sup>6</sup> These recommendations are considered to be biased or influenced by other factors [see Brown, Forster & Noreen (1985)]. Lin & McNichols (1995), McNichols & O'Brien (1996), Michaely & Womack (1996) and Rajan & Servaes (1997) find that IPO recommendations are frequently made by affiliates of investment banks associated with the float and are over-optimistic in their forecasts.

<sup>7</sup> In terms of the corporate legislation drafted in most western countries, the ultimate decision making authority rests with the board of directors. However, in practice, most everyday decision making is not closely scrutinised ex-ante by shareholders or monitors of management. Rather, the monitoring usually takes the form of whether particular global targets have been achieved [see Levy & Sarnat (1990, Chapter 1)].

*dilution* (the subordination of existing debt for new debt claims), *under-investment* (forgoing profitable investment projects by the firm that appear to benefit only debtholders), *asset substitution* (undertaking more risky projects because the costs of the project are borne by debtholders), or *overpayment of dividends* (representing a direct wealth transfer from debtholders to equity holders) [see Jensen & Meckling (1976), Myers (1977), Smith & Warner (1979), Barnea, Haugen & Senbet (1981), Carey, Prowse, Rea & Udell (1993) and Megginson (1997 pp331-333)].

Agency costs are also present in the equity market, although issues of primary equity are made less frequently than debt issues. When a firm is wholly owned and operated by a single entity, agency costs are mute as there is no separation of ownership and control. This is because all of the resources are held by active decision makers of the firm. However, in Jensen & Meckling's (1976) conceptual framework, there is a transfer of wealth from new to old equity holders when part of the firm's shares is sold by founding owners. As the relative stakes in the firm change, incumbent owners have incentives to reduce the wealth of the new equity holders through perquisite consumption (perks). Consequently, existing managers have incentives to induce agency costs so long as the benefits from direct consumption of the firm's assets exceeds the diluted recourse they have to residual equity claims through ownership.

Moreover, firms seeking exchange listing for the first time, and thus moving from a private share-ownership to public ownership structure, have very little pre-quotation disclosure or past historical information available. Consequently, new equity holders face severe adverse selection problems as existing shareholders know more about the firm than

new equity holders<sup>8</sup>. Myers & Majluf (1984) and Miller & Rock (1985) view equity issues as a 'bad news' managerial signal, indicating that the future performance of the firm is expected to be adverse. Further, there is empirical evidence to support the theoretical proposition that equity issuance is bad news, as the share price of the issuer frequently decreases at the time of the new equity issue announcement<sup>9</sup> [see Mikkelsen & Partch (1986), Asquith & Mullens (1986), Hess & Bhagat (1986) and Eckbo & Masulis (1995, p1041-4)]. This price decline is consistent with the theoretical predictions of Jensen & Meckling (1976), Myers & Majluf (1984) and Miller & Rock (1985), and is in stark contrast with bank loan announcements [see James (1987)].

#### **4.2.2 The Level and Frequency of Monitoring and Financial Intermediation**

In debt markets, the main focus is on repeating and renewable contractual relationships [see Carey, Prowse, Rea & Udell (1993)]. The intermediary acts as a monitor of the contractual responsibilities and thereby reduces information asymmetries between borrowers and lenders. In doing so, the intermediary creates its own niche over time, as it becomes more specialised and efficient in servicing its clients. Loan renewal in a costly information setting also implies that an on-going relationship with the financial institution is necessary to ensure continued access to the debt market. However, there is some debate concerning the optimal number of intermediaries [see Sharpe (1990) and Rajan (1992)]. The advantage of dealing with a single intermediary is that it ensures that private and

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<sup>8</sup> The information asymmetry problem may be alleviated by credible information certifiers that improve information quality and content [see Barry, Muscarella, Peavy & Vetsuypens (1989, 1990) examining venture capitalists, Chen & Lin (1996) for underwriters with equity stakes and the audit reputation literature generally].

<sup>9</sup> Megginson (1997, p441) reports that the magnitude of the price decline is approximately one-third of the value of the new equity raised.

business sensitive information can be assessed for the purposes of establishing loan serviceability, without full disclosure to the market. While this enhances 'relationship-specific' reputation capital for both the borrower and the intermediary, in the medium term it raises the possibility of hold-up costs where borrowers find it difficult to transfer to other intermediaries because the cost of establishing a close relationship with another intermediary is prohibitive or may take time to develop [see Sharpe (1990) and Rajan (1992)]. Alternatively, a limited number of borrowers may be able to generate their own reputation capital and thereby eventually avoid the need for an intermediary and issue directly.

In contrast with debt markets, equity raisings occur less frequently. Consequently, the reduced interaction between the principal and agent reduces the extent to which reputation capital mitigates wealth transfer effects. While the debt-market literature suggests information advantages in retaining the services of the same intermediary in repeat business, there is evidence indicating that firms switch underwriters for later equity issues [see Hansen & Torregrosa (1992), Krigman, Shaw & Womack (1999) and Nanda & Warther (1998)].

#### **4.2.3 Underwriting in Equity Markets**

The underwriting of securities is a 'dynamic process' involving a financial intermediary (or multiple intermediaries in syndication) raising funds from investors on behalf of the issuing firm. It requires a significant commitment of resources by both the issuing firm and its agent [see Foerster (1999, p73)].

Issuing firms benefit from underwriting in several ways. First, the underwriter participates regularly in the issuing process and often works in conjunction with other professionals such as accounting and legal firms, the Australian Stock Exchange, and the Australian Securities and Investments Commission. Underwriters gain expertise and superior knowledge about the demand for equity securities, and have immediate access to well developed distribution channels. Such specialisation permits the underwriter to overcome shortcomings associated with the production of costly information, to identify which investors to approach to support the issue (i.e. reduced search costs), to select distribution techniques that improve the chance of achieving full subscription at lowest cost<sup>10</sup>, and to focus on key shareholders in the deliberate pursuit of a stable shareholder base. Economies of scale and scope suggest that the underwriter could be more cost-effective than a firm issuing primary equity directly.

Second, the underwriter frequently acts as an independent certifier of information. Thus, the underwriter shares an onerous obligation with the managers of the issuing firm and auditors (prospectus preparers) to ensure that the release of issue information is fair and reasonable. In the event of false claims, underwriters stand to lose real value through litigious action.

Third, the underwriter often provides ancillary corporate advice (for example the setting of the offer price and advice on the optimal ownership structure) and interpretative

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<sup>10</sup> Welch (1992) argues that successful subscription depends on the formation of a 'positive cascade'. If offers are made to subscribe sequentially, and are observable to the next market participant, then investor psychology would suggest that subsequent participants would follow the leader (herd behaviour). Hence, the existence of a positive cascade is critically determined by the choice of the first investor.

research services (such as analysts' forecasts and recommendations). If shareholders are heterogeneous, then the ownership structure of the firm and its implication for corporate governance may be relevant to the firm's issuing strategy<sup>11</sup>. Although recent theoretical models have attempted to explain the advantages of inducing a particular ownership structure at the time of the offering [see Mello & Parsons (1998) and Stoughton & Zechner (1998)], the precise motivation for preferential allocation of equity is contentious. Hanley & Wilhelm (1995) show that institutional shareholders appear to be allocated a disproportionately large share of new issues. Furthermore, Ritter (1999) suggests that with such large amounts of 'money left on the table' (underpricing), representing immediate gains to existing shareholders through a transfer of wealth from new to old shareholders, such activities may be subtly manipulated by underwriters to support the long-term objective functions of the underwriter/investment bank coalition.

Fourth, underwriting often guarantees the minimum net proceeds (gross proceeds less the direct costs of issuance that incorporates the underwriting fee) raised by the firm<sup>12</sup>. As such, it fulfills an insurance function against adverse price fluctuations and changes in stock market conditions [see Mandelker & Raviv (1977, p683)]. It allows the issuing firm to undertake planned investment policy with certainty as underwriters are expected to contribute to any shortfall of funds should full subscription not be achieved. Contracts that guarantee the amount of funds raised by the underwriter are known as firm commitment

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<sup>11</sup> There is some evidence in the corporate governance literature that suggests that active and professional block holders are more likely to monitor management and improve shareholder value [see Wruck (1989), Burkart, Gromb & Panunzi (1997) for international evidence, and Lange & Woo (1995) for Australian evidence].

<sup>12</sup> Despite the existence of an 'underwriter', not all underwriting agreements guarantee the value of the net equity raised.

contracts, whereas contracts that only specify the advisory, pricing and distribution role are known as best-efforts in the United States and best endeavours in Australia. By contractually insuring its cash resources, the issuing firm can partially (best-efforts) or completely (firm commitment) transfer the risk of not obtaining full subscription to the underwriter in exchange for the underwriter's compensation. In addition, underwriters reduce information asymmetries that exist between the issuing firm, potential new shareholders and existing founding shareholders.

In addition to the benefits that accrue to issuing firms, underwriters may provide economic benefits to the stock market as a whole through screening [see Chemmanur & Fulgheri (1994)]. Allocational efficiency is enhanced if the underwriting decision allocates scarce funds to their most productive use [see Hayek (1945) and Reiter (1989)]. Thus, underwriters may reduce the deadweight social economic loss by limiting the access of firms with inferior investment opportunities to sources of finance<sup>13</sup>.

In summary, the preceding discussion highlights the role that transaction costs, specialisation, economies of scale/scope, certification and reputation, advice and interpretative services, and risk transfer play in primary equity formation. While, these features are more formally addressed in the debt literature explanations of financial intermediation, they are also common to equity issuance.

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<sup>13</sup> This procedure implies that through repeated issues, underwriters make comparisons between issuers, and develop skills in distinguishing between superior and inferior issues.



### **4.3 Theories of Financial Intermediation**

It is not the role of this dissertation to provide an exhaustive discussion of the theories of financial intermediation in imperfect capital markets. However, basic concepts underlying the theories of financial intermediation are implicit in modeling the decision to underwrite. Further, recent research into IPOs focusing on the functions and roles of underwriters and their reputation, have at their roots an understanding of the financial intermediation literature<sup>14</sup>. Whether the organisation in question is a bank, a mutual fund, a finance company, an insurance company, or a provider of underwriting services, the literature on financial intermediation is founded on the idea that if capital markets were perfect and competitive, then intermediaries “perform no unique financial service that investors would be unable to reproduce as easily” [Campbell & Kracaw (1980, p39)].

Several rationales have been provided for the existence of financial intermediaries, particularly banks. These include the transaction cost hypothesis, the information asymmetry hypothesis, reputation effects, the liquidity hypothesis and the risk transfer / avoidance hypothesis.

#### **4.3.1 Transaction Cost Hypothesis**

The role of an underwriter can be viewed in terms of an intermediary’s ability to defray transaction costs. The transaction cost explanation assumes that financial contracts are costly, and the role of the intermediary is to reduce the total cost of undertaking

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<sup>14</sup> The new issues literature has at its basis the anomalous finding that primary equity securities are underpriced, and the focus of the debate has been keenly centred on underpricing and to some extent the allocation mechanism. In contrast, the debt literature has tended to be focused more on the economic interpretation of how intermediation affects the allocational efficiency for debt, rather than pricing consequences. However, the explanations for underpricing have broad implications for allocational efficiency of equity raising and the demand for financial intermediation in this market.

economic transactions through the exploitation of economies of scale and scope [see Black (1975), Benston & Smith (1976) and Diamond (1984)].

One advantage of an intermediary is that its involvement in the market place is continuous. Search costs are reduced because the costs of identifying an intermediary are cheaper than finding lenders or potential investors without intermediation. Moreover, a centralised intermediary that deals simultaneously with many different market participants has a higher probability of matching and satisfying the needs of individuals with different preferences for a varying number of security characteristics (such as risk, maturity, rating and coupon rates).

As financial intermediaries participate in a large number of transactions, they accumulate experience across events and time [see Milgrom & Roberts (1982)]. Quite often the volume of transactions results in the intermediary investing in costly infrastructure and the development of procedures designed to effectively manage the flow of funding requests that are not easily or cheaply replicated or 'mimicked' by others. Such barriers to entry allow the intermediary to provide financial services in a less than perfectly competitive environment. Moreover, greater service and product differentiation may occur if the intermediary specialises or gains a superior reputation for a given set of tasks. In this process, principals benefit by allowing a centralised agency to process information, thereby taking advantage of economies of scale in information processing and certification [see Black (1975), Benston & Smith (1976), Campbell & Kracow (1980) and Diamond (1984, 1991)].

Also, intermediaries may generate further transaction cost efficiencies if the portfolio of services offered are complementary [see James (1987, p217)]. In the new issues market, underwriters offer ancillary services beyond traditional underwriting including interpretative services such as analysts recommendations, research reports and price stabilisation.

Syndication of underwriters may be another means for the issuing firm to reduce transaction costs [see Hansen & Torregrosa (1992)]. Cost savings arise as greater resources and effort are applied by a team resulting in faster subscriptions. Alternatively, syndication may reduce the prospect of hold-up costs if the issuing firm engages several investment banks. Hansen & Torregrosa (1992, p1537-9) examine the economic impact of underwriter syndication on seasoned industrial offers and find that, with syndication, compensation is reduced for issues with greater monitoring *in situ* and that underwriter spreads are U-shaped, reflecting diminishing returns to managing and co-ordinating larger offerings and increased risk bearing.

In the debt market, firms seeking funds choose between a public debt issue with relatively high and fixed issue costs and obtaining an intermediated loan with relatively small fixed costs but with a higher interest rate [see Blackwell & Kidwell (1988) and Esho, Lam & Sharpe (1999)]. These observations lead to the prediction that the demand for intermediation is inversely related to issue size, as smaller funding requirements are more efficiently sourced through intermediaries.

Establishing the cost differential of intermediated versus non-intermediated primary

equity offerings poses an empirical problem, as only the cost of the selected alternative is observed. As there is no evidence to suggest that net benefits conferred from underwriting outweigh the direct costs of not underwriting an issue (or vice versa) and there is no indication as to how fixed and variable costs are related across underwritten and non-underwritten issues, the relationship between issue size and demand for underwriting services is of uncertain sign.

#### **4.3.2 Information Asymmetry Hypothesis**

Financial institutions can reduce potential agency costs in debt contracts by acting as delegated monitors<sup>15</sup>. That is, they monitor borrowers on behalf of lenders [see Campbell & Kracow (1980), Diamond (1984) and Berlin & Loeys (1988)]. The information asymmetry hypothesis draws on the observation that financial intermediaries monitor and often provide privately-sourced and reputable signals of information to the market. Exactly how information asymmetry enters into the picture is not entirely clear [see Krishnaswami, Spindt & Subramaniam (1999, pp7-8)]. Black (1975) and Fama (1985, p39) suggest that intermediaries possess superior information sets as they collect the transactions history of borrowers/customers over time. Furthermore, they make loans of relatively short maturity that may be regularly refinanced. Other authors argue that intermediaries directly affect the level of information asymmetry through the enforcement of higher disclosure standards [see Ramakrishnan & Thakor (1984) and Hadlock & James (1997)]. Alternatively, by forging closer relationships in the private debt market, firms are

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<sup>15</sup> Monitoring occurs when the principal (public lender) or intermediary (bank) undertakes specific tasks to ensure incentive compatibility of the agent (borrower). Monitoring which is costly, is used to assess whether the agent is performing or has performed his/her duties satisfactorily, and hence provides the means of reducing moral hazard [see James (1992)].

more likely to disclose more business-sensitive information to one or a small group of intermediaries than they would disclose to the public markets if they believe that their disclosure will be used sensitively in the determination of their loans [see Bhattacharya & Chiesa (1995)].

Diamond (1991) argues that extensive initial external monitoring reduces long-term adverse behaviour of borrowers via certification. In this model, the intermediary acts as an initial screening device when information asymmetries are more severe. Effective monitoring by the intermediary then permits the development of a track record concerning loan serviceability. Over time, the borrower adds to its reputational capital which eventually results in 'safe' borrowers being able to directly access the debt markets.

In the primary equity market there is empirical evidence to suggest that both the auditor and underwriter<sup>16</sup> have the potential to reduce information asymmetries inherent in the issuance process. Prior IPO literature has considered that the reputation of the auditor has an important certification element which reduces the degree of information asymmetry between the firm and potential shareholders [see DeAngelo (1981), Beatty & Ritter (1986),

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<sup>16</sup> Underwriter reputation is also an important consideration, given the existence of information asymmetries. Jain & Kini (1999) assess the role of lead investment bank reputation and monitoring of initial public offers. They argue that a lead investment bank undertaking due diligence on the firm during an equity issue gains an information advantage relative to other investment banks and, through later monitoring, is able to add value to the firm [see also Hansen & Torregrosa (1992)]. The empirical results of Jain & Kini (1999) suggest that the reputation of the lead bank is positively related to post listing performance, and that this performance is better when analysts unaffiliated with the investment bank involved in the offering (i.e. independent third parties) choose to monitor the issue. There is also evidence that underwriter reputation is important in the certification of primary equity issues [see Logue & Lindvall (1974), Neuberger & Hammond (1974), Kumar & Tsetsekos (1993), Michaely & Shaw (1994) and Nanda & Yun (1997)]. Further, there is also evidence that the underwriter is penalised by the stock market, in terms of falling market share, for failing to adequately carry out their ascribed functions [see Logue (1973), Neuberger & Hammond (1974), Michaely & Shaw (1994), Nanda, Yi & Yun (1995), Nanda & Yun (1997), Nanda & Warther (1998) and Dunbar (1998, 2000)].

Balvers, McDonald & Miller (1988), Beatty (1989), Datar, Feltham & Hughes (1991), Feltham, Hughes & Simunic (1991), Menon & Williams (1991), Hogan (1997) and an Australian study by Lee, Stokes, Taylor & Walter (1999)].

Hogan (1997) argues that when selecting auditors, issuing firms will choose an auditor that minimises the cost of the auditing, implying a 'differentiated market' for audit firms. DeAngelo (1981) and Simunic & Stein (1987) suggest that audit services can be differentiated by quality, as Big 8 accounting firms provide superior audit services relative to their counterparts. Similarly, Lee, Stokes, Taylor & Walter (1999) provide further evidence of auditor heterogeneity in Australian IPO market and report that reputable auditors are associated with IPOs that have higher levels of firm specific risk as measured by three measures: the standard deviation of residual returns, the asset composition of the firm, or the age of the firm (up to 10 years). There is also evidence to suggest that auditor reputation reduces underpricing [see Beatty (1989)] and that it is common for issuing firms to change auditors prior to a public listing [see Carpenter & Strawser (1971)].

Titman & Trueman (1986) argue that both auditors and underwriters act as a positive signal of firm quality. Specifically, Balvers, McDonald & Miller (1988) suggest that the underwriter implicitly makes a decision about the auditor, and attempts to seek a high quality auditor to assimilate and verify financial information in the issuance process, thereby protecting the underwriter's reputation and reducing the probability of mispricing. Hogan (1997, p74) suggests that "underwriter quality may substitute for or complement audit quality". In terms of underwriter reputation, Chemmanur & Fulgheri (1994, p75) argue that the extent to which asymmetric information problems may be resolved increases

with underwriter reputation. Underwriters may influence the differential levels of informativeness directly through the level of information disclosure, or indirectly through the existence and reputation of the underwriter serving as a signal or endorsement of quality. In either case, it is expected that issues with greater information asymmetry have a higher probability of being underwriter sponsored<sup>17</sup>.

#### **4.3.3 Firm Reputation Effects**

The hypothesis relating to firm reputation effects is closely related to the information asymmetry arguments above, and represents a direct way in which the firm mitigates informational asymmetry concerns. Diamond (1991) predicts that only firms of particularly high reputation are able to overcome agency concerns, whereas for low to medium reputation firms, agency issues still persist. Some signalling models of IPO underpricing suggest that high quality/reputable firms can signal their type by leaving money on the table and discounting the offer price, which is a strategy that cannot be easily mimicked by low reputation firms [see Allen & Faulhaber (1989), Grinblatt & Hwang (1989) and Welch (1989)].

Firm reputation is important because the more credible and established the issuing firm, the less reliant it is expected to be on underwriting services. In this sense, firm reputation serves to overcome the moral hazard problem. Consequently, an inverse relationship is expected between firm reputation and the demand for underwriter services.

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<sup>17</sup> This is implication 6 of the theoretical model of Chemmanur & Fulgheri (1994). The authors expect non-underwritten issues to be made where firms are unable to engage a credible investment bank or situations where there is little information asymmetry.

#### 4.3.4 Liquidity Hypothesis

The liquidity hypothesis assumes that the ability to realise cash has two inter-related dimensions [see Van Horne (1978, p13)]. The first involves transaction costs and the length of time required to convert the asset into cash, while the second involves the price at which this is achieved. A financial intermediary is able to improve the flow of funds in the market as it acts as a centralised clearing mechanism. Customers know its location and its reputation when acting as a go-between for both sides of the transaction. In terms of the structure of financial markets, the existence of a financial intermediary significantly improves the probability of transacting relative to a barter system (where any interaction is undertaken bi-laterally with huge search, implementation, and transfer costs) [see Friend & Longstreet (1967)]. Further, as intermediaries operate continuously in capital markets they are able to compartmentalise and/or aggregate securities into smaller or larger units, thereby satisfying heterogeneous investors' needs and preferences. Such technologies allow individuals to reduce personal risk by holding more diversified portfolios. Moreover, the process improves the flow of saving from savers to users of funds [see Van Horne (1978, pp5-6)].

Diamond & Rajan (1999) explain the growth of the banking sector in terms of improved liquidity. They argue that banks provide liquidity on both sides of the balance sheet, acting as an agent for both lenders and borrowers. However, the role of financial intermediaries in the provision of liquidity differs between debt and equity markets. Whereas in debt markets financial institutions guarantee an immediate 'cash-out' value, this



definition of liquidity is not entirely relevant in equity markets<sup>18</sup>. In the sale of primary equity, the underwriter acts as broker or match maker and assists in the setting of the offer price. Indeed, the primary task in underwriting is to find a sufficient number of investors willing to take on the risk profile of the security offered. The underwriter is not responsible for secondary liquidity which is facilitated via trading of secondary securities on the stock exchange.

The liquidity hypothesis suggests that underwriters will be appointed by issuers if they can improve the price of funds raised (offer price) or the speed of the fund raising process. In general, the more heavily discounted the offer, the easier it is to sell. In turn, if the issue is easy to sell, it will not require underwriting. Consequently, the demand for underwriting services is expected to be inversely related to the liquidity of the issue.

#### **4.3.5 The Risk Transfer / Avoidance Hypothesis**

Allen & Santomero (1996, p1) argue that traditional theories of financial intermediation are 'increasingly less relevant' as they overlook the fact that, in recent years, the demand for intermediaries has grown despite the increasing sophistication of financial markets. In such circumstances, traditional theories predict less intermediation. As an explanation for the recent growth in intermediation, Allen & Santomero argue that the intermediary provides a functional role in the market place of managing and facilitating risk transfer. This view is also supported by Merton & Bodie (1995), Merton (1989), Allen & Santomero (1999) and Allen & Gale (1997, 1999) who suggest that inter-temporal non-

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<sup>18</sup> The role of underwriting includes the guarantee of a fixed equity raising, but as previously indicated, not all underwritten issues have this feature.

diversifiable risks may be optimally borne by long-lived financial institutions.

The importance of bankruptcy costs has been stressed in Stiglitz (1969). Megginson (1997, p329) suggests “it is painfully clear that overly-indebted companies can be severely penalised if they cease being able to service their debts, and managers of failed companies usually face bleak subsequent career prospects”. Bankruptcy costs involve a deadweight loss as the firm is no longer productive in the economy. Moreover, the process of liquidating assets (direct costs of bankruptcy) is also expensive<sup>19</sup>, particularly for smaller organisations [see Warner (1977a, 1977b)]. Firms act to avoid bankruptcy costs in order to maintain their going-concern requirement. However, the party that bears the greatest cost and risk is the ordinary equity holder. The probability of bankruptcy may be reduced by lowering the debt-equity ratio, by either reducing debt levels or increasing equity via new primary issues. Consequently, equity funds may be needed to successfully reduce the probability of bankruptcy.

If firms are financially constrained, it may be difficult to issue equity without an intermediary. Consequently, the bankruptcy hypothesis suggests that financially constrained or highly levered firms cannot afford to run the risk of a failed equity issue and require an underwriter to guarantee their funding opportunities. Thus the demand for underwriting is positively related to firm risk.

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<sup>19</sup> Pham & Chow (1989) measure the costs of bankruptcy in Australia as roughly 20-25% of the value of the firm assessed at the time of the bankruptcy announcement.

## 4.4 Model Description

### 4.4.1 The Model

In the previous section, five main influences affecting the demand for underwriting services were identified: transaction costs, information asymmetry, firm reputation, liquidity, and risk transfer/avoidance. With the addition of a set of control variables, the general form of the model for the demand for underwriting services, with partial derivatives signed, is:

$$UW_{i,t} = f(\overset{+/-}{\text{Transaction Costs}}, \overset{+}{\text{Information Asymmetry}}, \overset{-}{\text{Reputation}}, \overset{+}{\text{Growth}}, \overset{-}{\text{Opportunities}}, \overset{-}{\text{Firm Reputation}}, \overset{-}{\text{Liquidity}}, \overset{+}{\text{Firm Risk}}, \overset{+}{\text{Control Variables}}). \quad (4.1)$$

These hypotheses are tested using logistic regression analysis<sup>20</sup> which is a binary choice model. The dependent variable,  $UW$ , representing the presence of underwriting services associated with the issue is a binary choice variable which is equal to one when the issue is underwritten and zero otherwise. The logistic regression is non-linear in the dependent variable,  $UW$ , but is transformed into a linear model with respect to the natural logit, defined as the log odds of an outcome occurring with probability,  $\pi$ , that ranges from  $[-\infty, \infty]$  and is represented as  $\ln\left(\frac{\pi}{1-\pi}\right)$ . Hence, the general form of the logistic regression is :

$$\ln\left(\frac{\pi}{1-\pi}\right) = \hat{\beta}_0 + \hat{\beta}_1 X_1 + \hat{\beta}_2 X_2 + \dots + \hat{\beta}_n X_n + \hat{\varepsilon} \quad (4.2)$$

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<sup>20</sup> The logistic regression analysis fits a sigmoidal (tilted 'S') response function, that is roughly linear between dependent values of 0.2 - 0.8, but becomes asymptotic at the end points of 0 and 1. The parameters are determined iteratively using the maximum likelihood method, as a closed form solution cannot be found.

where  $\hat{\beta}_k$  represents the regression coefficients of the independent variables,  $X_k$  for  $k=1$  to  $n$  and  $\hat{\varepsilon}$  is the random error term.

#### 4.4.2 Proxies Used

In this study, transaction costs are proxied by issue size<sup>21</sup>. However, as noted in Section 4.3.1, the sign of the relationship between issue size and the demand for underwriter services is uncertain. The issue costs associated with primary equity issues may be driven by increasing search costs<sup>22</sup> [see Diamond (1989)], where extreme issue sizes may result in higher transaction costs (expressed as a cost per dollar raised), implying that the relationship between issue size and transaction costs could be non-monotonic. On the one hand, small issues are subject to relatively high fixed administrative costs associated with accessing the equity market [see Buckland & Davis (1987)]. These access costs act as a barrier to entry and expose investors to illiquid investments and higher transaction costs per dollar raised. On the other hand, large issues might be harder to sell as the size of the issue may saturate the limited pool of available funds. Hence, greater selling and search costs may be incurred in meeting the target subscription. To account for this non-linearity, it is assumed that the relationship between transaction costs and the demand for underwriting services is represented by a quadratic function in issue size.

Issue size is measured in terms of total equity raised in real 1997 dollars and is transformed to account for skewness and kurtosis using the natural logarithmic transform,

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<sup>21</sup> Issue size is often used as a proxy for transaction costs [see Smith (1977), Bhagat & Frost (1986), Blackwell & Kidwell (1988), Johnson (1997) and the Australian study by Esho, Lam & Sharpe (1999)].

<sup>22</sup> This refers to “the imperfect technologies for informing agents of their trading opportunities and bringing together potential traders” [Diamond (1989, p271)].

$\ln(SIZE)$ . To account for the non-linearity, the square of the log of issue size ( $SQRDLN$ ) is also included in the logit analysis. The signs of both  $\ln(SIZE)$  and  $SQRDLN$  are uncertain and offsetting.

Six proxies for information asymmetry are considered in the model. The first two proxies, auditor reputation and retail bank reputation, identify external organisations that lend their reputation to the issuing firm for the purpose of external monitoring and certification of the issue. The presence of a high reputation auditor and retail bank is therefore commensurate with lower levels of information asymmetry for the issue. The use of auditors as a signal of information and firm quality is not new [see DeAngelo (1981), Titman & Trueman (1986), Simunic & Stein (1987), Bachar (1988), Beatty (1989), Datar, Feltham & Hughes (1991), Hogan (1997) and Lee, Stokes, Taylor & Walter (1999)]. There is a common belief among underwriters that “a big accounting firm adds a stamp of integrity to a company’s financial statements ... and instills confidence in investors regarding the future prospects of the new issue” [Bachar (1988, p218)]. In Australia, Lee, Stokes, Taylor & Walter (1999) find a positive relationship between IPO risk and the selection of a high quality auditor, which strongly supports the notion of certification of issuer quality through audit reputation<sup>23</sup>. Auditor reputation is measured by a binary variable, *AUDIT*, which is equal to one for Big 6/8 accounting firms and zero for non-Big 6/8 accounting firms. Based on the fact that high reputation auditors reduce information asymmetry, a negative relationship is expected between audit quality and demand for

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<sup>23</sup> Lee *et al.* (1999) also find that after controlling for risk, IPOs with lower retained earnings or those providing voluntary earnings forecasts are more likely to have engaged a Big-8 auditor.

underwriting services<sup>24</sup>.

The reputation of the retail bank associated with the issuing firm is also expected to be positively correlated with issuer quality. Both James & Weir (1990) and Slovin & Young (1990) show that the existence of a borrowing relationship prior to an IPO reduces uncertainty about the market value of a firm and is associated with lower levels of underpricing. The reduction in uncertainty occurs as the lender is able to reduce the potential information asymmetry by monitoring the borrower's activities at lower comparative cost. Retail bank reputation is measured by the binary variable, *RETAIL* which is equal to one if the bank is one of the four major Australian banks (that is the National Australia Bank Limited, ANZ Banking Group, Commonwealth Bank of Australia and Westpac Banking Corporation Limited) and zero otherwise. If the reputation of retail banks reduces information asymmetry, then *RETAIL* is expected to be negatively related to the demand for underwriting services.

In keeping with the proposition of firm quality-signalling models under information asymmetry, such as Leland & Pyle (1977), a high level of ownership retention of the founding shareholders is expected to reduce information asymmetry [see Downes & Heinkel (1982)]. High retention rates by the founding shareholders indicate that retaining the original undiversified stake in the issuing firm is a superior investment strategy to cashing out at the time of the IPO. As the prospectus and information memoranda disclose

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<sup>24</sup> Balvers, McDonald & Miller (1988) focus on the interaction between investment bank and auditor reputation and propose a high positive correlation between investment bank and audit reputation. Consequently, a result which does not support information asymmetry is consistent with this study.

the extent that prior shareholdings are diluted by the new equity issue, *RETENT* is measured as the number of issued shares held prior to the issue (taking into account any stated sale of shares by founders should this be disclosed), divided by the number of post-issue shares (including vendor consideration<sup>25</sup>). The higher the founding ownership retention, the less important the information asymmetry problem. Consequently, it is expected that a negative relationship exists between *RETENT* and the demand for underwriting services.

It is recognised that there are fundamental differences in the valuation of mining and industrial firms. Industrial firms have relatively stable cash flows and easily determinable asset values. However, resource firms face stochastic commodity prices, large working capital requirements, and uncertain mineral reserves, so that valuations involve greater uncertainty [see Lonergan (1994)]. Hence, a binary variable *INDUS*, which takes on a value of one if the issuing firm is resource-based and zero otherwise, is incorporated in the model. It is predicted that a positive relationship exists between the demand for underwriting services and *INDUS*.

It is commonly believed that moral hazard problems are greater in firms with growth opportunities as proxied by the market to book ratio which is expected to reflect both the future investment opportunities and potential costs of contracting of moral hazard faced by the firm [see Krishnaswami, Spindt & Subramaniam (1999, p415)]. Thus the demand for monitoring, and hence the demand for underwriting services, is directly related to the presence of growth opportunities. Growth opportunities in this study are measured by the

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<sup>25</sup> Complications arise when founding shareholders' shares are unlisted or unquoted.

firm's market to book ratio, denoted *GROWTH*. If markets are efficient in pricing future earnings and the firm's assets are recorded at book values in the financial statements, then the market to book ratio will capture the firm's growth opportunities. As firms with higher growth opportunities are more likely to be underwritten, we expect a positive relationship between *GROWTH* and the demand for underwriting services.

Asset quality, which is measured in terms of the value of net tangible assets per share (*NTAPS*), is included in the model as an alternative proxy to growth opportunities. *NTAPS* reflects the degree to which concrete values can be applied to the assets of the firm, with higher values of *NTAPS* suggesting that the firm could be valued by external parties more easily<sup>26</sup>. The usefulness of net tangible assets per share to potential shareholders is emphasised in the ASX Guide to Listing (1997, p13) requiring that prospective issuing firms satisfy a 'net tangible assets test', where the total net tangible assets are a minimum of A\$2M and less than 50% is to be held in cash and liquid assets. Moreover, investors infer higher firm quality and low firm risk from a larger net tangible asset base, all other things held constant. Hence, asset quality is expected to be negatively related to the demand for underwriting services.

In debt markets, firm reputation is often measured in terms of publicly available loan credit ratings. While a similar measure is not available in equity markets, alternate proxies such as firm age and profitability may proxy firm reputation [see Ritter (1984), Young & Ziam (1988), Taylor & Walter (1990) and How, Izan & Munroe (1991)]. Age

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<sup>26</sup> Lee, Stokes, Taylor & Walter (1999) use a variation of net tangible assets as a measure of asset composition, arguing that it is a proxy for growth opportunities.



has also been considered in the debt market literature [see Carey, Prowse, Rea & Udell (1993)] and the new issues literature [see Chemmanur & Fulgheri (1995) and Pagano, Panetta & Zingales (1998)] as an adequate proxy information risk. Older firms are by definition, more established and recognisable in terms of name and reputation than a relative newcomer. Age is measured as the number of years of operation since establishment. Careful reading of the issuance disclosures provides detail on either the number of years since establishment, the year in which the entity started operations, or the year of incorporation. In the event of more than one disclosure, *AGE* is proxied by the time to the issue from the earliest record of the firm's existence<sup>27</sup>. The past performance of the firm is another measure of firm reputation and firms that are profitable are more likely to be advanced in establishing their cash flows. A binary variable, *PROFIT*, that takes a value of one if the issuing firm is profitable prior to listing and zero otherwise is used to proxy for firm reputation<sup>28</sup>. Both *AGE* and *PROFIT* are expected to be negatively related to the demand for underwriter services.

Liquidity represents the ease with which an issue can be sold. It is expected that the greater the offer price is discounted from its true underlying value, the faster the sale. Assuming perfect foresight, the expected level of underpricing is measured by actual underpricing, *UPG*, as defined in equation 2.3. The higher the level of underpricing, the greater the offer price is discounted relative to the market's initial assessment of the value

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<sup>27</sup> The date of founding is not reported consistently in Australia and quite often a firm has been operating for longer than it has possessed public company status. As age is designed to measure the reputation impact of the firm's longevity, if corporate disclosures show a longer period of operating life, this statistic has been used as the age proxy.

<sup>28</sup> Ideally, the proxy should capture a pre-listing value of profit. For some issuers this was not possible from the documents released at the time of disclosure. However, the value could be determined at the time of the first annual report where comparative figures were often released covering the pre-listing period in question. It is noted however, that at times the prior year disclosures were adjusted by the firm.

of the firm at the time it first lists. Therefore the liquidity measure, *UPG*, is expected to be inversely related to the demand for underwriting services<sup>29</sup>.

Three alternative measures of risk are included in the model. Andrade & Kaplan (1998, p1445) suggest that high leverage may result in : (1) curtailed capital expenditures; (2) an increased need to sell off assets or indeed equity at depressed values; and (3) in an increased probability of bankruptcy. As firms are free to independently select capital structure, leverage has been used to reflect the degree to which the firm might be financially constrained. *LEVERAGE* is measured as the ratio of debt to equity financing at the time of the prospectus disclosure. Because the measurement of leverage is directly affected by the primary equity issue, alternative market based risk measures such as the systematic risk of the firm, *BETA*<sup>30</sup>, and the standard deviation of the first 30 daily returns, *SD30*, are included in tests of the model. All three measures are expected to be positively associated with the demand for underwriting services<sup>31</sup>.

An alternative interpretation for the leverage variable is offered by Hegde & Miller (1996), claiming that the risk of an issue is a decreasing function of its pre-IPO beta. This view assumes that debt acts as a signal of firm quality, which provides a similar interpretation to that of Ross (1977). In these signalling models, it is assumed that higher levels of debt are serviced by higher quality firms. The signalling model predictions yield

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<sup>29</sup> While the period of subscription may be a measure of the speed of equity funds raised, this data item proved difficult to collect as many prospectuses did not disclose the subscription close date.

<sup>30</sup> These betas have been calculated using maximum likelihood. While an ex-post measure for firm risk, beta has been included as there is no other suitable and quantifiable alternative available. It is recognised that this poses a limitation on the study.

<sup>31</sup> A difficulty with both *BETA* and *SD30* measures is that they are only observed after listing.

a negative association (opposite to that predicted by firm risk proxies) between *LEVERAGE* and the demand for underwriting services as higher quality firms are less likely to need underwriters to certify and guarantee the sale of the issue.

#### **4.4.3 Control Variables**

Four control variables have been included in the model to allow for variations in exogenous influences such as competition for primary equity funds in the market place, variations in the yield on alternative investments as measured by a general stock market return that influences underwriting risk, changes in regulatory disclosure over the sample period, and potential self-marketing and underwriting capability.

There is evidence that the timing of a primary equity issue can improve its chances of successfully raising equity funds, particularly during 'hot' markets [see Ibbotson & Jaffe (1975), Ritter (1984) and Loughran, Ritter & Rydqvist (1994)]. Both the level of market ebullience and speculation plays a role in the firm's ability to gain funding and, in the case of seasoned offerings, has been shown to affect the level of information asymmetry [see Bayless & Chaplinsky (1993)]. Booth & Chua (1996) argue that for primary offerings, the precision of information improves and the cost of the information is reduced as a direct result of information spillover, where concurrent information about different issues in similar industries is concentrated or clustered. To control for such influences in the new equities market, *CONCUR* measures the degree of competition faced by a given issue for limited funds as a result of other issues being offered simultaneously. *CONCUR* is defined as the number of issues which come to the market in the three month period before the month of listing, which is consistent with the average time interval used to organise the

issue and gain listing in Australia and is similar to that proposed by Leleux & Paliard (1996). This variable is expected to be positively related to underwriter demand. In addition to the number of issues, investors also consider the opportunity cost or comparative yield available across investment alternatives. *MKTRET-1* and *MKTRET-3* measure the return on the All Ordinaries Accumulation Index over the preceding one or three months<sup>32</sup> respectively before listing. Similarly, another market performance measure, *RM* is adopted as an alternative to *MKTRET* which does not explicitly account for the reinvestment of dividends and is based on movements in the All Ordinaries Price Index. The demand for underwriting assistance is expected to be negatively related to these measures of stock market performance.

January 1, 1991 marked the point where changes in the Australian Corporations Law concerning prospectus content and disclosures became effective. Details concerning the nature of the disclosure were discussed in Section 2.2.1. This exogenous change in disclosure regulation is controlled for by the inclusion of an indicator variable, *REGUL*, which takes a value of unity for issues after January 1, 1991 and zero otherwise. As the regulatory changes were less restrictive and generally required greater interpretation, the impact of the regulatory change is expected to lead to an increased demand for underwriting services. Consequently, the sign of the relationship between *REGUL* and the demand for underwriting services is positive.

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<sup>32</sup> There is some contention [see Curtis (1997)] as to whether the risk of an Australian issue extends over the entire period of underwriter association (three months) or after the due diligence and in the selling period where the underwriter contractually assumes the risk (one month) [refer to Section 2.4]. Consequently, both time intervals are included.

The possibility that some firms may be capable of self-marketing and distributing their own shares is controlled for in the model. Firms capable of self marketing may have lower demand for underwriting services relative to other firms. A binary variable, *KNOWHOW*, which equals one if the issuer operates in the finance industry and zero otherwise is incorporated to reflect the degree to which a given firm is capable of self-marketing its own equity issue. It is predicted that *KNOWHOW* is inversely related to the demand for underwriting services.

A summary of the main hypotheses and expected signs of the relationships is provided in Table 4.1. The variables used are defined in Appendix VIII.

**Table 4.1 A Summary of the Model of Demand for Underwriting Services**  
(Dependent Variable *UW* takes on the value of unity if underwritten and zero if non-underwritten)

<b>Theories of Financial Intermediation</b>		
<b>EXPLANATION</b>	<b>VARIABLE (Proxy)</b>	<b>PREDICTED SIGN</b>
<b>TRANSACTION COSTS</b>	Size $\ln(\text{ISSUE SIZE } \$97)$	?
	$[\ln(\text{ISSUE SIZE } \$97)]^2$	
<b>INFORMATION ASYMMETRY</b>	Quality of Accounting Procedures ( <i>AUDIT</i> )	-
	Quality of Banking Relationships ( <i>RETAIL</i> )	-
	Founding Shareholders' Retention ( <i>RETENT</i> )	-
	Industry - Valuation Differences ( <i>INDUS</i> )	+
	Growth Opportunities ( <i>GROWTH</i> ) Market/Book Value of Equity	+
	Collateral - Asset Quality ( <i>NTAPS</i> )	-
<b>FIRM REPUTATION</b>	<i>AGE</i> (in years)	-
	Past Performance ( <i>PROFIT</i> )	-
<b>LIQUIDITY</b>	Expected Level of Underpricing % ( <i>UPG</i> )	-
<b>RISK TRANSFER / AVOIDANCE</b>	Beta - OLS ( <i>BETA</i> )	+
	Financial Constraints ( <i>LEVERAGE</i> ) debt/equity	+ (risk interpretation) - (signalling interpretation)
	Standard Deviation of Returns over the First 30 days of Trading ( <i>SD30</i> )	+
<b>CONTROL VARIABLES</b>		
<b>MARKETING INFLUENCES</b>	Number of Concurrent Issues ( <i>CONCUR</i> )	+
	Market Performance % ( <i>MKTRET-1</i> & <i>MKTRET-3</i> , RM25 & RM75)	-
<b>REGULATION</b>	Regulatory Influence ( <i>REGUL</i> ) [pre 91 = 0, post 91 = 1]	+
<b>KHOW-HOW</b>	Self-marketing Capability Financial Know-how ( <i>KNOWHOW</i> )	-

## 4.5 Data and Empirical Results

### 4.5.1 Data

Table 4.2 presents summary descriptive statistics for a sample of 906 issues for which there is a complete set of data for each variable entering into the regression model.

Of the original sample of 1,351 issues, the underwriter for 266 issues could not be identified because a complete copy of the prospectus or information memorandum was not available. Most of these firms were second board listings where a historical record of the corporate disclosures is no longer publicly available. A further 179 issues are excluded where data was incomplete for one or more variables<sup>33</sup>. To reduce the impact of extreme observations, outliers are truncated to values five standard deviations away from the mean<sup>34</sup>. However for the market to book ratio, used as a proxy for growth opportunities, observations are truncated at the 95 percentile due to extreme outliers.

The average issuing firm in this sample has total assets of \$158.9M and raises \$6.7M measured in 1997 dollars. It has an average age of 6.45 years, a debt to equity ratio of 0.88, a beta value of 0.57 and 46.25% of the issuers in the sample were profitable prior to listing. The original shareholders in the firm, on average, retain a 42.1% holding in the new listing, while there is a 30% probability that the issuing firm is resource-based. In addition, there is a 70% probability it is associated with a Big 6/8 auditor and a 68% probability it banks with one of the four major trading banks in Australia.

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<sup>33</sup> These exclusions relate to the following omissions/non-disclosures: pre-listing profit (61), age (37), beta estimates and share price information (32), retail bank(s) (27), issue costs (13) and leverage (9).

<sup>34</sup> Regressions were also run across the sample without truncation but are not reported. The results are not influenced substantially by censoring the data.

Table 4.2 Summary Descriptive Statistics (n= 906 issues)

Variable (Proxy)	Mean	Median	Range	Std Devn.	Skewness	Kurtosis
Total Assets \$M 97 <sup>(u)</sup>	157.86	8.34	1.00 - 87,410 <sup>(u)</sup>	2,946.40	29.319	868.553
Issue Size \$M 97 <sup>(u)</sup>	26.000	5.530	1.00 - 1,500 <sup>(u)</sup>	97.000	10.283	128.432
Underwriting Dummy (UW) [UW=1, non-UW=0]	0.8300	1.00	0.00 - 1.00	0.3700	-1.771	1.138
Issue Size \$M 97 (ln(SIZE))	15.7156	15.5257	10.286 - 21.105 <sup>(a)</sup>	1.4382	0.453	1.161
Quality of Accounting Procedures (AUDIT) [Big 6/8=1, other=0]	0.7020	1.00	0.00 - 1.00	0.4576	-0.885	-1.220
Quality of Banking Relationship(s) (RETAIL) [Big 4=1, other=0]	0.6799	1.00	0.00 - 1.00	0.4668	-0.773	-1.406
Founding Shareholders Retention (RETENT)	42.0860	45.8167	0.00 - 99.64	27.6601	-0.145	-0.965
Industry - Valuation Differences (INDUS) [Mining=1, other=0]	0.3046	0.00	0.00 - 1.00	0.4605	0.850	-1.280
Net Tangible Assets per share (NTAPS)	105.2859	43.3224	0.00 - 2,635.86 <sup>(a)</sup>	269.8486	7.439	63.149
Growth Opps. Mkt/Bk Value of Equity (GROWTH)	1.4460	0.7785	0.00 - 8.74 <sup>(c)</sup>	2.0382	2.711	6.483
Age (years) (AGE)	6.4457	1.00	0.04 - 83.27 <sup>(a)</sup>	13.3330	3.635	14.767
Past Performance (PROFIT)	0.4625	0.00	0.00 - 1.00	0.4989	0.151	-1.982
Expected Level of Underpricing % (UPG)	0.3388	0.1000	-0.84 - 7.9470 <sup>(a)</sup>	0.9867	5.222	33.463
Beta - OLS (BETA)	0.5705	0.4847	-3.49 <sup>(b)</sup> - 4.62 <sup>(a)</sup>	0.7864	-0.086	5.369
Financial Constraints (LEVERAGE) Debt/Equity	0.8773	0.1963	-8.550 -15.1578 <sup>(a)</sup>	2.1899	4.640	25.662
Std Deviation of Returns - first 30 days (SD30)	0.0451	0.0351	0.00 - 0.2152 <sup>(a)</sup>	0.0334	1.917	5.190
Number of Concurrent Issues (CONCUR)	69.2892	59.000	1.00 - 144.00	44.3622	0.322	-1.259
Market Performance % (MKTRET-1)	0.0116	-0.0259	-0.1900 - 0.7281	0.1668	3.207	10.486
Regulatory Influence (REGUL) [pre 91=0, post 91 =1]	0.2130	0.00	0.00 - 1.00	0.4097	1.404	-0.029
Self-marketing Capability (KNOWHOW)	0.1413	0.0000	0.00 - 1.00	0.3485	2.063	2.262

Source: Dissertation Database. KEY: (a) Truncated at +5 SD (b) Truncated at -5 SD from the mean (c) Truncated at the 95% level (t) Mode is at truncation (u) untransformed values.



Table 4.3 provides descriptive statistics for 753 underwritten issues (including both firm commitment and best effort types) and 153 non-underwritten issues, accounting for 83.1% and 16.9% of the sample respectively. The t-statistic for the difference between the two sample means is reported in the right hand column [see Kenkel (1996, p477)].

In comparison with non-underwritten issues, those that are underwritten are more likely to be associated with a (more reputable) big 6/8 accounting firm, have a higher probability of being a resource-based firm, have a higher measure of systematic risk, and involve a lower expected level of underpricing. Moreover, issues after the regulatory change in 1991 have a higher probability of being underwritten. These observations are generally consistent with the predicted relationships summarised in Table 4.1.

The exception is the prediction for the audit variable where one would expect, on the basis of information asymmetry, to find that *ceterus paribus* issuing firms audited by less reputable auditors are more likely to be underwritten. Despite this lack of support for the univariate information asymmetry explanation, the apparent positive relationship for the *AUDIT* variable is consistent with the proposition of Titman & Trueman (1986) and Balvers, McDonald & Miller (1988) that a positive relationship exists between underwriter and auditor reputation, implying a joint reputation effect. In this framework both the underwriter and the auditor play a role in the resolution of information asymmetries and, consequently, underwritten issues are more likely to adopt relatively high reputation auditors. It follows that if issuing firms switch to high quality auditors immediately before the new issue, as observed in the United States, then a positive relationship between *AUDIT* and the demand for underwriting services may be observed.

The two sub-samples in Table 4.3 are statistically indistinguishable in terms of both the firm and issue size (based on untransformed values), the reputation of the issuer's retail bank; the level of retained ownership of the founders in the issue, net tangible assets per share, growth opportunities, age, profitability and leverage.

Table 4.4 indicates the correlations between the variables in the model. The dependent variable used in the logit regressions *UW*, is highly positively correlated with the resource industry indicator variable, *INDUS*<sup>35</sup>, that captures industry differences in valuation, the issue size measures, *LNSIZE* and *SQRDLN*, auditor reputation, *AUDIT*, systematic risk of the issuer, *BETA*, and the regulation control variable, *REGUL*. While the positive association between *UW* predicted in Table 4.1 with the following variables, *INDUS*, *BETA* and *REGUL* is confirmed, the positive relation between *UW* and auditor reputation, *AUDIT*, is unexpected as noted previously.

Other significant relationships identified include a strong association between alternative risk measures, particularly, *BETA* and *SD30*, and, a strong association between the four alternative measures of market performance. However, as these proxies enter the model one at a time, the strength of the inter-relatedness is not seen as a major problem for the multivariate regression analysis.

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<sup>35</sup> *INDUS* is itself strongly associated with *LNSIZE*, *SQRDLN*, *AUDIT*, *PROFIT*, *AGE* and the various risk measures.

Table 4.3 Summary Descriptive Statistics for Underwritten and Non-underwritten Issues

Variable (Proxy)	Underwritten Issues (n=753)		Non-Underwritten Issues (n=153)		Differences Between Sample Means (T-Statistic)
	Mean	Standard Deviation	Mean	Standard Deviation	
Total Assets \$M 97 <sup>(u)</sup>	176.99	3,230	63.62	224.23	0.9519
Issue Size \$M 97 <sup>(u)</sup>	25.00	92.00	27.00	12.00	-0.5730
Log of Issue Size \$M 97 ( <i>ln(SIZE)</i> )	15.8671	1.3342	14.9702	1.6838	6.2048***
Squared Log of Size ( <i>SQRDLN</i> )	253.5413	43.3788	226.9250	53.3640	5.7928***
Quality of Accounting Procedures ( <i>AUDIT</i> )	0.7251	0.4468	0.5882	0.4938	3.1753***
Quality of Bank Relationship ( <i>RETAIL</i> )	0.6839	0.4652	0.6601	0.4752	0.5668
Founding Shareholders' Retention ( <i>RETENT</i> )	41.9875	26.2410	42.5707	33.8859	-0.2010
Industry Valuation Differences [Indus. =0, Mining =1] ( <i>INDUS</i> )	0.3333	0.4717	0.1634	0.3709	4.9156***
Net Tangible Assets Per Share ( <i>NTAPS</i> )	101.4973	281.7346	123.9321	201.0989	-1.1668
Market to Book Value of Equity ( <i>GROWTH</i> )	1.4913	2.0625	1.2227	1.9051	1.5673
Age (years) ( <i>AGE</i> )	6.3466	13.1174	6.9335	14.3827	-0.4668
Past Performance ( <i>PROFIT</i> )	0.4648	0.4991	0.4510	0.4992	0.3117
Expected Level of Underpricing% ( <i>UPG</i> )	0.2573	0.8200	0.7396	1.5084	-3.8414***
Systematic Risk ( <i>BETA</i> )	0.6202	0.7329	0.3261	0.9760	3.5305***
Financial Constraints ( <i>LEVER</i> ) debt/equity	0.8834	2.1865	0.8475	2.2134	0.1833
Std. Deviation ( <i>SD30</i> )	0.0450	0.0328	0.0457	0.0363	-0.2209
Number of Concurrent Issues ( <i>CONCUR</i> )	69.5299	44.8082	68.1046	42.2197	0.3767
Market Performance % ( <i>MKTRET-1</i> )	0.0108	0.1681	0.0152	0.1608	-0.3062
Regulation ( <i>REGUL</i> ) [ pre 91=0, post 91 =1 ]	0.2258	0.4184	0.1503	0.3586	2.3049**
Self-Marketing Capability ( <i>KNOWHOW</i> )	0.1262	0.3323	0.2157	0.4126	-2.5221***

Source: Dissertation Database.

Table 4.4 Matrix of Correlation Coefficients for Variables Used in the Analysis

Variables	UW	LNSIZE	SORDLN	AUDIT	RETAIL	RETENT	INDUS	NTAPS	GROWTH	AGE	PROFIT	UPG	BETA	LEVERAGE	SD30	CONCUR	MKTRET	REGUL	KNOWHOW
UW	1.000																		
LNSIZE	0.234*	1.000																	
SORDLN	0.216*	0.997*	1.000																
AUDIT	0.112*	0.204*	0.206*	1.000															
RETAIL	0.019	-0.094	-0.099	-0.038	1.000														
RETENT	-0.008	-0.283	-0.279	0.036	0.041	1.000													
INDUS	0.138**	-0.122**	-0.127**	-0.119**	0.110**	0.002	1.000												
NTAPS	-0.031	0.131*	0.148*	0.045	-0.091	-0.058	-0.160**	1.000											
GROWTH	0.049	0.048	0.044	-0.028	0.044	-.121**	.196**	-.138**	1.000										
AGE	-0.016	0.239*	0.254*	0.080*	-0.026	0.111*	-0.167**	0.279*	-0.043	1.000									
PROFIT	0.010	0.225*	0.230*	0.072*	-0.061	0.072*	-0.422**	0.173*	-.118**	0.245*	1.000								
UPG	-0.183	-0.176	-0.168	-0.037	-0.001	0.007	0.039	0.032	.211**	-0.022	-0.045	1.000							
BETA	0.140*	0.055	0.052	-0.075	0.113*	0.012	0.378**	-0.041	0.052	-0.047	-0.170	0.090*	1.000						
LEVERAGE	0.006	0.128*	0.136*	0.051	-0.055	0.018	-0.164**	0.414*	0.291**	0.258*	0.182*	-0.053	-0.076	1.000					
SD30	-0.008	-0.257	-0.261	-0.113	0.085*	0.019	0.400**	-0.144	0.041	-0.206	-0.328	0.121*	0.285*	-0.165	1.000				
CONCUR	0.012	-0.109	-0.114	-0.011	0.043	-0.044	-0.049	-0.061	0.078*	-0.218	-0.063	0.095*	0.038	-0.019	0.233*	1.000			
MKTRET	-0.010	-0.018	-0.021	-0.028	-0.031	0.000	0.021	-0.009	-0.016	0.015	-0.006	0.038	0.037	-0.032	0.015	-0.006	1.000		
REGUL	0.069*	0.280*	0.278*	0.033	-0.030	-0.068	-0.022	0.018	-0.058	0.273*	-0.001	-0.112	-0.006	0.052	-0.165	-0.428	-0.007	1.000	
KNOWHOW	-0.096	0.003	0.001	0.029	-0.021	-0.226	-0.241**	-0.006	-0.044	-0.137	-0.001	-0.009	-0.096	-0.060	-0.039	0.285*	0.008	-0.110	1.000
Note: ** indicates that the correlation is significant at the 0.01 level. * Indicates that the correlation is significant at the 0.05 level.																			

Source: Dissertation Analysis.

#### 4.5.2 Logit Regression Results

Table 4.5 summarises the results of the logit regressions. In all cases the joint null hypothesis, that the coefficients of the logit regression are zero, is rejected on the basis of the chi-squared goodness of fit test-statistic [see Neter, Kutner, Nachtsheim & Wasserman (1996, p590-596)]<sup>36</sup>. The chi-squared statistic for Regressions 1-5 are significantly higher than the critical value of 31.9999 (at the 1% level of significance), given sixteen degrees of freedom. As indicated in Section 4.4, alternative proxies have been suggested for three of the five hypotheses. Hence, the five regressions reported in Table 4.5 capture the variations in alternative proxies for information asymmetry (*NTAPS* or *GROWTH*), firm reputation (*AGE* or *PROFIT*) and firm risk (*BETA*, *LEVERAGE* or *SD30*). The log-likelihood and percentage of correct predictions across all five regressions do not vary widely. The variables common to all of the regressions include the transaction cost proxies *ln(SIZE)* and *SQRDLN*, the asymmetric information proxies *AUDIT*, *RETAIL*, *RETENT* and *INDUS*, the liquidity proxy *UPG*, and the control variables, *CONCUR*, *MKTRET*, *REGUL* and *KNOWHOW*.

Regression 1 provides the highest explanatory power. It incorporates the common variables listed above, together with *NTAPS* proxying information asymmetry, *AGE* proxying firm reputation, and *BETA* used as a measure of firm risk. The empirical results for this base regression provide general support for the transaction cost, liquidity and risk transfer /avoidance hypotheses and, at best, weak support for the asymmetric information hypothesis. With respect to transaction costs, there is a significant quadratic functional relationship between issue size and demand for (or probability of) underwriting services,

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<sup>36</sup> Psuedo-R<sup>2</sup>s have not been reported as they must be interpreted with caution. The logit model assumes that all independent variables are continuous, and unlike a standard linear regression, the psuedo R<sup>2</sup> accounts for cross-products between the variables, so that it is no longer equivalent to one minus the ratio of the error sum of squares to the total sum of squares (the OLS R<sup>2</sup> definition) Acknowledgment to Dr Eric Sowe, School of Economics, UNSW for drawing my attention to this matter.

**Table 4.5    Logit Regression Results (n=906 issues)**  
(Regressions 1-5)

Dependent Variable: UW denoted as Underwritten Issue (1), Non-underwritten Issue (0)						
Independent Variables (Proxies)		Regression Coefficients and Wald-Statistics				
		Regression 1	Regression 2	Regression 3	Regression 4	Regression 5
Explanation	Constant	-40.2862 (30.60)	-38.8514 (29.76)	-41.0374 (32.05)	-40.7531 (31.79)	-40.7426 (31.96)
Transaction Costs	Log of Issue Size SM 97 ( <i>ln(SIZE)</i> )	4.7541 (27.48)***	4.5756 (26.57)***	4.8607 (29.10)***	4.7971 (28.33)***	4.8150 (28.66)***
	Squared Log of Size ( <i>SQDLN</i> )	-1.1356 (23.01)***	-1.1299 (22.05)***	-1.1399 (24.94)***	-1.1362 (23.48)***	-1.1371 (23.84)***
Asymmetric Information	Quality of Accounting Procedures ( <i>AUDIT</i> )	.6032 (8.26)***	.6070 (8.36)***	.6088 (8.39)***	.5642 (7.31)***	.5613 (7.22)***
	Quality of Bank Relationship ( <i>RETAIL</i> )	-.0120 (.00)	-.0176 (.01)	-.0114 (.01)	.0284 (.02)	.0309 (.02)
	Founding Shareholders' Retention ( <i>RETENT</i> )	.0064 (2.78)*	.0061 (2.55)*	.0054 (1.93)	.0067 (3.04)*	.0066 (2.99)*
	Industry Differences in Valuation [Indus=0, Mining =1] ( <i>INDUS</i> )	.9524 (11.81)***	.9352 (11.44)***	1.0572 (13.50)***	1.1234 (17.57)***	1.1971 (18.15)***
	Net Tangible Assets Per Share ( <i>NTAPS</i> )	.0004 (.77)	-	.0002 (.37)	.0004 (.80)	.0004 (0.86)
	Market to Book Value of Equity ( <i>GROWTH</i> )	-	-.0009 (0.10)	-	-	-
Firm Reputation	Age (years) ( <i>AGE</i> )	-.0082 (1.02)	-.0067 (.70)	-	-.0086 (1.09)	-.0089 (1.19)
	Past Performance ( <i>PROFIT</i> )	-	-	.2027 (.87)	-	-
Liquidity	Expected Underpricing % ( <i>UPG</i> )	-.3387 (15.22)***	-.3302 (13.94)***	-.3423 (15.30)***	-.3194 (13.79)***	-.3182 (13.67)***
Risk Transfer / Avoidance	Systematic Risk ( <i>BETA</i> )	.2822 (4.63)**	.2856 (4.72)**	.2890 (4.87)**	-	-
	Financial Constraints ( <i>LEVER</i> ) debt/equity	-	-	-	.0027 (.00)	-
	Std. Deviation ( <i>SD30</i> )	-	-	-	-	-2.8726 (.77)
Control Variables	Number of Concurrent Issues ( <i>CONCUR</i> )	.0041 (2.38)	.0040 (2.23)	.0044 (2.72)*	.0045 (2.84)*	.0050 (3.35)*
	Market Performance % ( <i>MKTRET-L</i> )	-.1086 (.03)	-.1183 (.04)	-.1268 (.04)	-.0720 (.01)	-.0597 (.01)
	Regulation ( <i>REGUL</i> ) [pre 91=0, post 91=1]	.1026 (.11)	.0779 (.07)	.0688 (.05)	.1138 (.14)	.1122 (.14)
	Self-Marketing Capability ( <i>KNOWHOW</i> )	-.5927 (4.52)**	-.5901 (4.48)**	-.5485 (3.93)**	-.5888 (4.44)**	-.5949 (4.53)**
Number of Observations (n)		906	906	906	906	906
Chi-square for the Model		140.72***	139.98***	140.61***	136.00***	136.75***
-2 Log Likelihood		682.11	682.84	682.21	686.82	686.07
Correct Predictions (%)		85.32%	85.32%	84.88%	84.77%	84.44%
KEY: All Wald statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels respectively.						

Source: Dissertation Analysis

with the demand for underwriting services positively related to the log of issue size and negatively related to this variable squared. This implies that the relationship between the demand for underwriting services and issue size is ‘∩’ shaped, suggesting that the demand for underwriting is lower for both small and large issues than for medium sized issues. Based on the coefficients from Regression 1, the issue size corresponding to the point where the probability of underwriting reaches its maximum is \$41.0 M in 1997 dollars<sup>37</sup>, compared with an average issue size of \$26M. The finding is consistent with the propositions of Chemmanur & Fulgheri (1994, pp74-75) who argue that offerings which are very small or very large are less likely to be underwritten. Smaller issues are subject to higher transaction costs brought about by diseconomies of scale and scope, making small issues costly and riskier to sell. Consequently, underwriters are more likely to reject small issuers as clients. Transaction costs may also impact on very large issues, as larger more established issuers with strong links to existing customers may have sufficient self-reputation to issue directly without the need for underwriting. This result is consistent with observations in the debt market that only exceptionally large firms have the ability to raise debt privately [see Diamond (1991)].

In addition, there is strong evidence to support the liquidity hypothesis, given the significant inverse relationship between expected underpricing levels and the demand for underwriting services. More liquid issues with higher levels of underpricing have lower marketing and distribution risk, and hence have less need for underwriting services.

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<sup>37</sup> This estimate was determined by solving the quadratic where :

$$\frac{\delta UW}{\delta LNSIZE} = 4.7541 - 2(0.1356)LNSIZE = 0.$$

In terms of the risk avoidance hypothesis, the firm's systematic risk or beta is significantly and directly related to the demand for underwriting services in Regressions 1-3. Firms with high levels of systematic risk are more likely to be underwritten. In contrast, both *LEVERAGE* in Regression 4 and the standard deviation of the first 30 days returns, *SD30*, in Regression 5 are statistically insignificant. These findings mirror those found in Table 4.3 where the underwritten sub-sample has a higher mean beta than the non-underwritten sample but where leverage and standard deviation of returns are not significantly different across the sub-samples. Similarly, in the bivariate correlations in Table 4.4, only the measure of systematic risk is significantly correlated with the demand for underwriting.

The only support for the information asymmetry hypothesis in the regression results relates to the positive relationship between the demand for underwriting services and differences in industry valuations, *INDUS*. Resource-based issues, which are generally considered to be less transparent to value, are more likely to be underwritten. However, contrary to apriori predictions of the model, the results suggest positive relationships between the demand for underwriting and both the level of founding ownership retention in the issue, *RETENT* (at the 10% significance level) and auditor reputation *AUDIT* (at the 1% significance level). While the result for *RETENT* is inconsistent with the asymmetric information hypothesis, it is consistent with a risk transfer/avoidance explanation where founders retaining a stake in the issuing firm adopt underwriters to protect their financial position and ensure a successful float. This explanation is supported by a recent study applying prospect theory to explain the presence of hot issue markets [see Loughran & Ritter (1999)]. These authors argue that founding shareholders have no major objection to 'leaving money on the table' if their net wealth post-listing is improved. Consequently, the demand for underwriting services may be directly related to founding shareholder retention



because of the insurance function performed by underwriting. Moreover, an examination of the correlation matrix in Table 4.4 indicates that *RETENT* is positively correlated with both *AGE* and *PROFIT*<sup>38</sup>, implying that *RETENT* may not be a good proxy for information asymmetry. Similarly, the significant positive relationship found for the *AUDIT* variable, proxying auditor reputation, may be attributed to: (1) firms switching to high quality auditors prior to the disclosure of listing information in order to overcome information asymmetry problems; or (2) to underwriters insisting on the appointment of high quality auditors [see Titman & Trueman (1986) and Balvers, McDonald & Miller (1988)]<sup>39</sup>.

The remaining proxies for information asymmetry in Regression 1, reflecting the quality of assets, measured by *NTAPS*, and banker reputation *RETAIL*, are each statistically insignificant, and when the ratio of market to book value of equity, *GROWTH*, is substituted for *NTAPS* as in Regression 2, it is also statistically insignificant. Thus, apart from the significance of the *INDUS* resource indicator variable, there is little support for the information asymmetry hypothesis in explaining the underwriting decision. Note also that the sign of *INDUS* is consistent with this proxy acting as a risk measure and thus is broadly supportive of the risk transfer/avoidance explanation.

There is no support for the hypothesis that firm reputation is inversely related to the demand for underwriting services. Neither of the firm reputation proxies, firm *AGE* in Regression 1 nor firm profitability in Regression 3 attain statistical significance. However, the effect of firm reputation may be captured elsewhere in the model as Table 4.4 reveals that *AGE* is positively correlated with issue size and negatively correlated with the resource

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<sup>38</sup> Table 4.4. indicates that *RETENT* is significantly correlated with *AGE* ( $p=0.111$ ) and *PROFIT* ( $p=0.072$ ).

<sup>39</sup> Carpenter & Strawser (1971) document U.S. evidence on pre-listing auditor switching. However, the extent of auditor switching is unknown for the sample of firms analysed in this study.

industry indicator variable.

An analysis of the control variables reveals a significant negative coefficient on the proxy for self-marketing ability, *KNOWHOW*, that is consistent with the prediction of an inverse relationship between finance industry issuers with greater marketing skills and experience in the new issues market and the demand for underwriting services. In addition, in some models there is evidence of a greater demand for underwriting services in periods where there is increased competition for primary equity funds. This result may also be interpreted within the risk-avoidance framework, as the greater competition for limited equity capital requires greater selling and distribution effort to ensure full subscription, and hence increases the demand for underwriting services. Somewhat surprisingly, none of the market performance measures, *MKTRET* and *RM*, are statistically significant<sup>40</sup>, although the sign of the variable is uniformly negative, as predicted in Table 4.1. The insignificance of this variable may be due to potential survivorship bias caused by restricting the sample to issues that successfully listed on the Australian Stock Exchange and where full data is available. As it is common in Australian underwriting agreements to insert clauses which allow underwriters to rescind the contracts in periods of major stock market corrections, the sample could be affected by withdrawn issues associated with major changes in the level of stock market activity. Finally, the introduction of the control variable *REGUL* in the model did not indicate any statistically significant change in the demand for underwriting services associated with the prospectus disclosure regulation in 1991.

Implicit in the model specification is the assumption that the choice of primary distribution method, that is the choice between a direct placement or an initial public offer,

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<sup>40</sup> Only *MKTRET1* regressions are reported here, and denoted as '*MKTRET*'. Regressions using the three-month pre listing measure of market performance measures based on the All Ordinaries Accumulation Index *MKTRET3* and corresponding measures using the price index *RM1* and *RM3* were run. However, the results using these proxies were the same as *MKTRET1*.

does not affect the underwriting decision. However, in the next chapter, it is assumed that the underwriting decision affects the choice of distribution method. In essence, these decisions are assumed to be recursive allowing single equation estimators to be specified for the respective choices. In Table 4.6, the sensitivity of underwriter choice to this assumption is examined by allowing the choice of distribution method to influence the demand for underwriters (using Regression 1) by adding the indicator variable *IPODP* which takes on a value of one if the issue is an IPO or zero if it is a direct placement. The coefficient of this variable is not significant in the regression, supporting the assumption that the underwriting choice is determined independently of the choice of distribution method. Moreover, adding this variable to the regression does not alter any of the other conclusions regarding the demand for underwriting services.

**Table 4.6 Logit Regression Results (n=906 issues)**  
(Interaction with Distribution Choice : Direct Placement versus Initial Public Offer)

Dependent Variable: UW denoted as Underwritten Issue (1), Non-underwritten Issue (0)		
Independent Variables (Proxies)		Regression Coefficients and Wald-Statistics
Explanation	Constant	-40.2226 (30.48)
Transaction Costs	Log of Issue Size \$M 97 ( <i>ln(SIZE)</i> )	4.7471 (27.37)***
	Squared Log of Size ( <i>SQRDLN</i> )	-.1354 (22.92)***
Asymmetric Information	Quality of Accounting Procedures ( <i>AUDIT</i> )	.6066 (8.33)***
	Quality of Bank Relationship ( <i>RETAIL</i> )	-.0144 (.00)
	Founding Shareholders' Retention ( <i>RETENT</i> )	.0062 (2.59)
	Industry Differences in Valuation [Indus. =0, Mining =1] ( <i>INDUS</i> )	.9490 (11.72)***
	Net Tangible Assets Per Share ( <i>NTAPS</i> )	.0004 (.80)
	Market to Book Value of Equity ( <i>GROWTH</i> )	-
Firm Reputation	Age (years) ( <i>AGE</i> )	-.0082 (1.00)
	Past Performance ( <i>PROFIT</i> )	-
Liquidity	Expected Underpricing % ( <i>UPG</i> )	-.3328 (14.40)***
Risk Transfer / Avoidance	Systematic Risk ( <i>BETA</i> )	.2791 (4.51)**
	Financial Constraints ( <i>LEVER</i> ) debt/equity	-
	Std. Deviation ( <i>SD30</i> )	-
Control Variables	Number of Concurrent Issues ( <i>CONCUR</i> )	.0040 (2.28)
	Market Performance % ( <i>MKTRET-1</i> )	-.1101 (.03)
	Regulation ( <i>REGUL</i> ) [pre 91=0, post 91 =1]	.1139 (.14)
	Self-Marketing Capability ( <i>KNOWHOW</i> )	-.5775 (4.28)**
	Method of Distribution ( <i>IPODP</i> )	0.0315 (0.51)
Number of Observations (n)		906
Chi-square for the Model		141.209***
-2 Log Likelihood		681.614
Correct Predictions (%)		85.54%
KEY: All Wald statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels respectively.		

Source: Dissertation Analysis.

## 4.6 Conclusion

Current international research on new issues pays scant attention to the determinants of underwriting services in primary equity formation. In some countries, such as the United States, this could be attributable to most of the primary equity offerings being fully underwritten. However, in Australia 17% of the primary offerings over the period 1983 - 1995 are not underwritten raising questions as to which factors influence the underwriting decision. Hence, in this chapter, the underwriting decision has been examined in detail. It is argued that the underwriter plays an important role in financial intermediation by certifying, monitoring, reducing the potential mis-allocation of resources, providing specialised expertise and information, and reducing risks in issuance process. In the absence of prior research on the underwriting decision, the theory of financial intermediation in debt markets is extended in order to specify a model explaining the underwriting decision for new primary equity issues. This leads to a model in which transaction costs, asymmetric information, firm reputation, liquidity and risk transfer/avoidance behaviour affect the demand for underwriting services.

This model was then tested on a sample of 906 primary issues of Australian firms using logit regression analysis. Overall, the empirical results provide an important contribution to our understanding of demand for financial intermediation in new equity markets in Australia. Generally, the findings are supportive of the transaction cost, liquidity and risk transfer/avoidance hypotheses, but provide only weak support for the asymmetric information hypothesis, in the decision to adopt an underwriter. There is also little evidence that firm reputation is influential in this decision. In the subsequent chapter, the decision to issue equity via direct placement versus initial public offer is considered.

## **CHAPTER 5**

### **DISTRIBUTION METHOD CHOICE**

#### **5.1 Introduction**

This chapter explores several economic theories used to explain the choice of distribution method for primary equity in Australia. This investigation takes place in a fixed-price offer environment, where the issue may or may not be underwritten, and where the issue results in stock exchange listing. Given these institutional features, primary equity in Australia can be raised from a diffuse set of public shareholders through an initial public offer (IPO) or from a relatively small and concentrated set of private or institutional investors via a direct placement (DP). Both these distribution channels may result in stock exchange quotation of shares, and thus are similar to the distribution mechanisms reported in France [see Husson & Jacquillat (1989) and Leleux & Paliard (1996)] and the United Kingdom [see Jenkinson & Mayer (1988) and Brennan & Franks (1997)]. However, direct placements are quite distinct from private placements in the United States, as private placements are prohibited from public secondary trading [see Ross, Westerfield & Jaffe (1991, p516), Chemmanur & Fulgheri (1999) and Ellingsen & Rydqvist (1997)].

The use of alternative distribution methods in Australian practice implies that neither method is redundant under the 'survivorship principle' through inefficiencies [see Hansen & Pinkerton (1982)], and that certain aspects of a chosen distribution method may be more advantageous than another for particular types of issuers. Observed outcomes from this choice provide information about the issuing firm's preferences and motivations. Moreover, factors affecting distribution choice are of current interest as we do not know the

basis upon which such decisions are predicated [see Maksimovic & Pichler (1999, p4,36)]. Nor do current theories provide definitive answers concerning distribution choice. Apart from legislative differences that define these methods, both IPOs and direct placements yield seemingly similar benefits to the issuing firm and its shareholders, measured in terms of an expanded equity base, greater capital resource opportunities, and improved liquidity through stock exchange listing [see Chemmanur & Fulgheri (1999)].

Chapter 2 discussed how primary equity is raised in Australia, describing the features of both the direct placement and initial public offer methods of distributing equity. Each distribution channel was seen to have its own distinctive features that may prove attractive to particular types of issuers. IPOs are the most common form of primary equity and are used in large equity issues and/or when there is a need to attract funds from a diffuse set of shareholders. Thus, Mello & Parsons (1998, p80) argue that an IPO is “particularly suited to the sale of dispersed shareholdings to small and passive investors but is not a good method for selling control” [Mello & Parsons (1998, p80)]. Moreover, public issues permit the widest solicitation, and are subject to the most stringent legislative requirements governing disclosure. The ownership structure that results from an IPO is, to a large extent, determined by market forces<sup>1</sup> when book-building is not used. Furthermore, flotation costs are relatively large [see Lee, Lochhead, Ritter & Zhao (1996)] and are often viewed as a barrier to entry to the public equity markets. This is because of the relatively high fixed administrative costs incurred in undertaking due-diligence and the regulatory and marketing costs of the issue [see Buckland & Davis (1987)].

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<sup>1</sup> That is, it depends on which shareholders respond to the issue.

In contrast with IPOs, direct placements are personalised, and are often targeted at a smaller number of large private and institutional investors. As these investors are considered relatively sophisticated and well-informed, and their primary business is that of securities trading, less restrictive disclosure requirements are required under Australian legislation<sup>2</sup>. Involvement with this segment of the investment community is made easier by the fact that these shareholders are familiar with the issue process and much of the preliminary information required under prospectus disclosure is perfunctory. Further, institutional investors have the motivation and the infrastructure necessary to obtain relevant information by private treaty, making them more capable monitors of issuing firms. Search and communication costs are also significantly reduced if the issuer's promoters are already closely associated with private and institutional investors [see Diamond (1989)]. Such relationships are improved through repeated association in either previous offerings or secondary market trading activities [see Ramakrishnan & Thakor (1984) and McDonald & Slawson (2000)].

Fenn & Liang (1995, p21) also cite other benefits from private financing. First, the issuing firm has much greater control over the scope and the dissemination of disclosed information. This also implies that commercially sensitive information can be restricted to the private domain. Second, as private issues involve greater block sizes and less shareholders, communication costs are lower and the speed with which the issue is brought to the market is often faster. Third, sophisticated investors are more likely to invest in unusual and difficult to value businesses that are frequently shunned by the public market.

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<sup>2</sup> The level of pre-quotation disclosure for private equity raisings (information memorandum) and public equity offers (prospectus) since July 1998 is the same, as the ASX mandated that any firm seeking to list on the Australian Stock Exchange should provide the same information content as a prospectus.



Finally, in cases where there are temporary trading interruptions in the public market, the private market may be the only form of available capital.

In specifying a model of the issuer's choice between an IPO and a direct placement in the next section, several of these differences in distribution methods are incorporated<sup>3</sup>. Thus, the model draws on several theoretical frameworks, including the new issues literature with its focus on optimal ownership structures and corporate governance, the public versus private funding choice framework from the debt literature with its focus on flotation costs, asymmetric information and monitoring, and the optimal distribution channel framework from the marketing literature.

Previously, the lack of a comprehensive database of Australian primary issues has meant that empirical research into the determinants of the choice of distribution method has not been feasible. However, the development of a unique database in this dissertation, covering both forms of distribution method, permits an extension of the existing research focus. The sample consists of 837 new floats comprising both initial public offers and direct placements that subsequently listed on the Australian Main or Second Boards over the period January 1983 to June 1995. The choice of distribution method is examined using a binary-choice logit model.

The structure of this chapter is as follows. Section 5.2 draws on the theoretical literature relating to new issues, debt funding choice and marketing distribution to develop

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<sup>3</sup> Very few papers have examined distribution choice. Ellingsen & Rydqvist (1997) examine distribution choice between a private placement and an IPO in the United States. However, their results have limited relevance to the Australian environment where exchange listing is inevitable.

a model explaining the choice of distribution method. Section 5.3 then discusses the sample used and the empirical approach adopted. The results of the logit analysis are presented in Section 5.4, while Section 5.5 contains the summary and conclusions of the study.

## **5.2 Model Specification**

This section develops hypotheses relating to the choice of distribution method where the dependent variable in the model, *IPODP*, is an indicator variable taking the value of unity for an IPO and zero for a direct placement.

### **5.2.1 Corporate Governance**

Corporate governance is concerned with how a firm is structured and governed. It takes into consideration choice parameters available to various stakeholders in the firm (managers, equity holders and debtholders) and explores how firms evolve over time in terms of efficiency and power structures [see Berle & Means (1933, 1968), Jensen & Meckling (1976) and Hill & Jones (1992)]. Set in a principal-agent framework, it recognises that, in practice, assumptions such as shareholder homogeneity and incentive compatible behaviour are often breached.

At the time of a primary issue, an issuing firm may target a particular shareholder mix in order to maximise the utility of the incumbent stakeholders. Thus, the choice of distribution method for primary equity may influence a firm's corporate governance structure by assigning preferences to particular ownership structures, corporate monitoring, and corporate control outcomes. Hence, corporate governance considerations have been

incorporated into theoretical frameworks describing the optimal allocation of shares for primary issues, specifically IPOs [see Zingales, (1995), Stoughton & Zechner (1998) and Mello & Parsons (1998)]. These models examine various allocation strategies that maximise the wealth of the seller by strategically targeting different combinations of institutional and retail investors. Further, the models take into account the order in which a segment of the issue is made to different investors and different assumptions concerning the offer price. Investors differ in their monitoring capacities, resource endowments, access to information, reasons to monitor, and motives for investing in the firm. Large institutional investors are assumed to possess greater resources for monitoring and to be able to gather information directly [see McConnell & Servaes (1990), Stapleton (1995), Mello & Parsons (1998) and Stoughton & Zechner (1998)]. It is also argued that large stakeholders or 'blockholders' are superior monitors of management relative to small atomistic shareholders, because they hold greater stakes in the firm [see Kiefer (1992) and Shleifer & Vishny (1986)]<sup>4</sup>.

In Mello & Parsons (1998), blockholders actively monitor managerial decisions and provide public benefits to all shareholders through the maximisation of firm value. The smaller (atomistic) shareholders, however, place a higher private valuations on shares<sup>5</sup> than blockholders because they can avoid costly monitoring activity by free-riding on the

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<sup>4</sup> Further, empirical evidence suggests that large institutional investors are superior stock-pickers in the evaluation of new issues [see Field (1997)] and general investments [see Rajgopal & Venkatachalam (1997), Bushee & Noe (1999) and Grinblatt & Keloharju (2000)]. They also provide depth and liquidity to the secondary market [see Australian Financial System : Final Report (1981), Section 33C], and seem to favour the use of momentum trading strategies [see Grinblatt, Titman & Wermers (1995) and Grinblatt & Keloharju (2000)].

<sup>5</sup> Booth & Chua (1996) consider that a higher share price will result if shares are diffusely allocated because of their improved liquidity.

monitoring supplied by large stakeholders. Consequently, the active discrimination in favour of institutional and block shareholders increases the market value of the firm for all shareholders. It is also shown that the firm will benefit if the issue to atomistic shareholders occurs before the offer to blockholders. This is because an IPO is particularly well suited to attracting small passive investors. However, these disperse shareholders do not necessarily improve the corporate governance structure of the firm. Also, the holder of an active block is capable of extracting private benefits and is also prepared to pay a higher value for shares. Consequently, from the issuing firm's point of view, a public offer for all shares at a uniform price is not an optimal pricing strategy. The observation of a symbiotic relationship between small and large investors would therefore imply some optimal shareholder mix between atomistic and active shareholders.

The Stoughton & Zechner (1998) model is similar to that of Mello & Parsons, in that the small investor benefits from free riding on the monitoring efforts of the blockholder. Yet their model is couched in an agency framework where the monitoring activity of the blockholder is unobservable. Also, the offer is initially made to institutional investors before the small investors, but all shareholders pay the same offer price. Consequently, if the offer price is fixed for all shareholders, then the rationing of script to small shareholders may be optimal. In the Stoughton and Zechner model, the original shareholders do not suffer diluted claims and relative wealth transfer effects because it is assumed that their entire shareholding is sold in the IPO. That is, the original stakeholders are assumed to cash out. In practice, however, the primary equity offer frequently augments the existing equity base, implying that the original owners may choose to retain some or all

of their shares<sup>6</sup>. This may result in a distortion of firm objectives. Hence, rather than concentrating solely on maximising gross proceeds, the original founders may also desire to retain control.

Several possibilities exist as to how control may be maintained by the founding shareholders. On the one hand, existing owners may issue diffusely, through an IPO, in order to protect their relative voting control<sup>7</sup>. Alternatively, owners may deliver blocks of shares through a direct placement to select shareholders with similar interests and expectations as the owners, thereby fostering a close and mutually beneficial relationship between the firm and suppliers of equity capital. The latter possibility may be particularly important if the size of the issue is relatively small because the cost of issuing blocks of shares is relatively low. Moreover, placing shares directly in the hands of large shareholders serves to transfer the costs of monitoring from existing shareholders to new shareholders.

In this chapter, the ability of founding shareholders to influence control is proxied by the level of ownership retention in the firm at the time of the offer, *RETENT*. When retention ratios are high, existing shareholders will wish to protect their current stake in the

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<sup>6</sup> Mikkelsen, Partch & Shah (1997) report median ownership stakes for U.S. firms prior to listing. The median ownership by blockholders is 95.9% before the issue, 54.6% immediately after the issue and rises to 66.1% ten years after the offering. For other classes of shareholders, the initial retention ratio for individuals, blockholders, venture capitalists, finance companies and non-financial companies also declines. This evidence is indicative of blockholders holding shares during the time of the offering, which is contrary to the theoretical assumptions of Stoughton & Zechner (1998).

<sup>7</sup> This explanation interprets the retention level of the founding shareholders at issuance as a signal of firm quality [see Leland & Pyle (1977), Downes & Heinkel (1982) and Grinblatt & Hwang (1989)].

firm by maintaining greater control. However, the sign of the relationship between ownership retention and distribution choice is uncertain, because control can manifest itself in different ways. If control is best maintained by delivering blocks of shares to preferred shareholders, this could be optimally achieved by a direct placement (implying a negative relationship between ownership retention levels and the probability of an IPO). However, if founders with large ownership stakes want to maintain relative voting control in the firm, the preferred distribution decision could be to allocate shares diffusely via an IPO (implying a positive relationship).

### **5.2.2 Transaction Costs**

Empirical evidence on flotation costs in initial public offers suggests that a significant proportion of overall issue costs are fixed in nature, and relate to the initial costs of accessing the equity markets [see Buckland & Davis (1987), Ritter (1987) and Lee, Lochhead, Ritter & Zhao (1996)]. The comparative costs of issuing in the form of a direct placement are lower than an IPO because a large component of the costs of going public such as legal compliance and the costs of ASIC prospectus registration and preparation can be avoided [see Chapter 2, Section 2.2.1]. Microeconomic theory suggests that costs of distribution can be lowered through economies of scale and scope arising from specialisation of economic activity and increased use of technology [see Leftwich (1973, p182)]. Firms making larger issues are expected to benefit more from economies of scale relative to those making small issues [see Blackwell & Kidwell (1988), Easterwood & Kadapakkam (1991) and Carey, Prowse, Rea & Udell (1993)]. However, it may not be beneficial to increase issue size beyond some threshold because the search costs of finding new investors to contribute additional equity capital in a very large issue may be

substantial. This suggests the possibility of a non-linear distribution cost structure [see Stigler (1951)].

In this chapter, transaction costs are proxied by the natural logarithm of issue size, *LNSIZE*, [see Smith (1977), Bhagat & Frost (1986), Blackwell & Kidwell (1988), Johnson (1997) and Esho, Lam & Sharpe (1999a, 1999b)]. The log of issue size squared, *SQRDLN*, is also incorporated in the model to account for the possibility that the relationship is non-linear [see Stigler (1951)]. It is expected that the sign of the coefficient on the *LNSIZE* variable will be positive, while that of *SQRDLN* will be negative. Thus, the probability of an IPO will be higher for a medium sized issue than for either a very small or a very large issue.

### **5.2.3 Information Asymmetries**

#### **(a) Signals of Firm Quality**

The public versus private funding decision for primary securities is extensively examined in the debt literature but less so in the equity literature<sup>8</sup>. Evidence from the debt market suggests that firms experiencing relatively high information asymmetry and agency costs are more likely to select privately sourced funding than public issues [see Blackwell & Kidwell (1988), Diamond (1984, 1991) and Berlin & Loeys (1988)]. In addition, reputation plays an important role in the alleviation of information asymmetries by providing an informative signal of quality [see Klein & Leffler (1981), Booth & Smith (1986) and McDonald & Slawson (2000)]. This is because non-salvageable capital serves

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<sup>8</sup> Other studies examining private equity sales, such as Wruck (1989), focus entirely on seasoned equity issues rather than new equity issues.

as a guarantee of quality. Thus, in debt markets, issuing firms of higher reputation and quality are more likely to use public than private funding [see Blackwell & Kidwell (1988), Diamond (1991) and Hoshi, Kashyap & Scharfstein (1992)].

Asymmetric information in equity markets is reinforced by the differential disclosure requirements for the distribution methods. The issuing firm adopting an IPO is required to provide more information to the public than if it were making a private offer. A firm with relatively transparent operations (that is, easy to value by external parties) forfeits little private information should it choose to issue publicly. However, a firm with a need to protect confidential information would prefer a direct placement, thereby keeping valued information in the hands of a concentrated set of investors. The ease with which assets can be valued may be proxied by several factors. Thus, firms with a greater portion of their assets held in tangible assets are believed to be easier to value [Lonergan (1994)]. Consequently, the probability of an IPO is expected to be directly related to net tangible assets per share, *NTAPS*. Ease of valuation is also related to the firm's industrial classification. Thus, it is generally accepted that industrial firms are easier to value than resource-based firms [see Lonergan (1994)]. Maksimovic & Pichler (1998, p3) extend this argument further by suggesting that issues made by firms in well established industries are easier to value and less risky to distribute. This is because issuers in industries with new technologies or potential discoveries face incentives to postpone information revelation. The authors suggest that industry classification based on technological innovation indicates situations where the problem of hidden information is greatest. Thus, industrial issues, by virtue of their greater transparency and lower risk, are more likely to choose the IPO distribution channel. On the other hand, resource-based firms that are more 'information



problematic' or difficult to value are more likely to issue privately [see Carey, Prowse, Rea & Udell (1993, p2)]. Thus, the probability of an IPO is expected to be inversely related to *INDUS*, an indicator variable that takes on the value of unity for a resource-based firm and zero otherwise.

Early IPO research suggests that auditor reputation is important in reducing the risk and information asymmetry of the issue because the reputation capital of the auditor increases the likelihood that a true and fair view is disclosed [see Titman & Trueman (1986), Beatty (1989), Balvers, McDonald & Miller (1988), Bachar (1988), Menon & Williams (1991), Taylor (1991), Pettway & Francis (1996) and Hogan (1997)]. Consequently, high reputation auditors (regarded as the Big-6/8 accounting firms) are more likely to be favoured by issuing firms with higher information asymmetries, resulting in a positive predicted relationship between auditor reputation and the probability of an IPO. Auditor reputation is measured as an indicator variable, *AUDIT*, which equals unity if the auditor is Big 6/8, based on rankings of accounting firms published in *Chartac* and zero otherwise.

Similarly, issuing firms with high growth opportunities are associated with greater information asymmetry [see Houston & James (1996) and Kahan & Yermack (1998)]. Such issues are perceived to be more difficult to value and require greater monitoring capacity. Reinforcing the relationship between growth opportunities and distribution choice is the observation that more information problematic issues may be shunned by the public but may be more readily accepted by private and sophisticated investors who have the technical and professional experience to evaluate non-standard and unconventional

issues [see Lee & Tweedie (1981) and Fenn & Liang (1995)]. Thus an inverse relationship is expected between the probability of an IPO and growth opportunities, proxied by *GROWTH*, a measure of the firm's market to book ratio<sup>9</sup>.

Another form of information signalling is the expected level of underpricing which is often used as a sweetener to potential subscribers to offset uncertainty arising from information asymmetries [see Rock (1986)]. Some IPO studies argue that underpricing acts as a form of inducement to reduce the potential for legal liability [see Tinic (1988), Hughes & Thakor (1992), Drake & Vetsuypens (1993), Keloharju (1993), Hensler (1995) and Welch & Beatty (1996)]. Issues with greater information asymmetry are expected to be more underpriced, as deliberately discounting an offer increases the yield and the probability of full subscription for more risky issues. Consequently, the probability of an IPO is expected to be inversely related to the level of underpricing, *UPG*, as defined by equation 2.3.

The leverage of the issuing firm at the time of listing is yet another signal of firm quality and information asymmetry [see Hegde & Miller (1996)]. Higher levels of debt are expected to be associated with higher cash flows and lower information asymmetry, consistent with the interpretation of leverage in Ross's (1977) signalling model. In this signalling context, the probability of an IPO is expected to be directly related to the issuing firm's ratio of debt to equity, denoted *LEVERAGE*.

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<sup>9</sup> *GROWTH* reflects both the future investment opportunities and the potential costs of contracting for moral hazard faced by the firm [see Krishnaswami, Spindt & Subramaniam (1999)].

**(b) Firm Reputation**

Firm reputation plays an important role in debt financing as performance and success rates in adhering to loan servicing requirements and covenants increases the issuing firm's ability to renegotiate loan conditions in the future [see Gilson, John & Lang (1990)]. The role of repeat business is not so important in equity markets, due to the perpetual nature of the ownership in a going-concern. However, discerning potential subscribers use firm reputation measures to provide a signal of future operating performance, and may ignore issues where firm quality is not assured. Public funds are raised by firms with a good reputation for credibility and serviceability in the capital market [see Carey, Prowse, Rea & Udell (1993, p26-27)], whereas less reputable firms are often relegated to private offers. Chemmanur & Fulgheri (1999, p251) suggest that information asymmetries in the context of a firm going-public involves the "need to convince a much larger group of investors that its projects are worth investing in". This task is less difficult the better the reputation of the issuing firm. Less reputable firms will not be able to seek subscribers as easily, and will consequently choose the direct placement mechanism.

Firm reputation is proxied in the model by age and profitability of the issuing firm [see Ritter (1984), Young & Zama (1988), Taylor & Walter (1990), How, Izan & Munroe (1991) and Carey, Prowse, Rea & Udell (1993)]. The credibility of the firm can be established with greater certainty when the financial history for the firm is available over a long time frame. Similarly, firms that are profitable are more likely to be considered as 'reputable' relative to firms where profitability is unknown. In this analysis, both firm reputation measures, *AGE* and *PROFIT*, are expected to be positively related to the probability of an IPO.

### (c) Firm Risk

The risk of an issue is generally reduced when information asymmetries are low or the issue is intermediated<sup>10</sup>. Maksimovic & Pichler (1999, p36) argue that uncertainty about firm value affects distribution choice. In this framework, the choice of distribution strategy depends on both the size of the issue and the relative dispersion of information in the market. Private offerings are favoured when adverse selection risk faced by retail customers is high, while IPOs are preferred when the adverse selection risk is low or the issue is small.

It is difficult to assess the risk of an issue, particularly when shares of the firm have not begun to trade. Three alternative risk measures are commonly used in the Finance literature, and hence are incorporated in the model: *LEVERAGE*<sup>11</sup>, *BETA* and the standard deviation of returns, *SD30*. Issuing firms of low risk indicated by low leverage (measured as the debt-equity ratio), low beta (calculated using maximum likelihood) and a small standard deviation of the first 30 daily returns are expected to have a higher probability of using the IPO distribution channel.

#### 5.2.4 Distribution Channel Structure

The marketing and distribution literature attempts to explain the pattern of relationships that occur between different organisations or groups of organisations within the distribution channel, where no particular assumption of 'perfect' market exist [see

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<sup>10</sup> A riskier firm has greater uncertainty surrounding its future cash flows than a less risky one, and issues involving higher risk are not as easily sold.

<sup>11</sup> The negative sign expected for *LEVERAGE* is opposite to that predicted under signals of firm quality.

Houston & Gassenheimer (1987, p4)]. The optimal distribution strategy is determined by exploiting efficiencies associated with the way a commodity passes through various intermediaries in the distribution channel to the final consumer [see Breyer (1964, p164) and Stern, El-Ansary & Coughlan (1996, p1)]. These efficiencies are commonly measured in terms of transaction costs.

Apart from transaction cost and information asymmetry explanations, other determinants of distribution channel choice within the marketing literature relate to: (a) competitive influences; and, (b) the power and reputation of intermediaries in the distribution process [see Etgar (1977) and Stern, El-Ansary & Coughlin (1996, p3)].

#### **(a) Competitive Influences**

Competitive influences include competition between new issues and competition amongst a wider set of alternative investments. Competition between new issues occurs when a new issue vies for equity funds with other new issues within the same time frame. On the other hand, competition amongst investment strategies recognises that investors compare new issues against seasoned equity (and other investments) with known track records. Greater competition from both segments of the stock market reduce the probability of a successful issue. There is also a linkage between competition and the level of information asymmetry. Bayless & Chaplinsky (1993) find that there is greater information asymmetry in hot markets. This implies that for periods of market activity where the number of concurrent issues is high, direct placements are more likely to be favoured.

The degree of competition between issues is measured by the number of concurrent

issues, *CONCUR*, which come to the market in the three month period before the month of listing. In addition, *MKTRET* provides a measure of the opportunity cost or comparative yield for the general stock market, measured by the return on the All Ordinaries Accumulation Index over the one month period prior to listing. It is expected that both *CONCUR* and *MKTRET* will be inversely related to the probability of an IPO.

**(b) Distribution Channel Power**

The use of power and other behavioural considerations in the distribution channel [see Wilkinson (1973)] may affect distribution outcomes [see Mattsson (1972)]. Distribution power is measured in terms of the extent to which one participant can impact on the decisions of another [see Wilkinson (1973, p3)]<sup>12</sup>. Power<sup>13</sup> has as its basis the fact that various resources can be applied to influence the degree of control wielded [see Dixon & Layton (1971) and Wilkinson (1973)]. Moreover, Beier & Stern (1969) argue that power in the distribution channel is more likely to be derived from the collection, assimilation and processing of information valued by the market at large. Because the role of an underwriter as a financial intermediary in the primary equity process involves the collection, assimilation and processing of valuable information, it has considerable power and / or control within the distribution process. Generally it improves the prospects of the capital raising, reduces the cost of market access, provides infrastructure for distributing shares, and reduces inherent information asymmetries. Hence, the model controls for the presence of an underwriter, *UW*, which takes the value of unity if there is an underwriter, or zero

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<sup>12</sup> The relative power of the issuing firm has already been discussed under firm reputation. The power of the underwriter is related to its role as intermediary. However, its importance may also be reinforced through standard market practice and perceptions.

<sup>13</sup> It can be economic, informational, reputational, authoritative and expert by nature.

otherwise. In establishing predictions in relation to the sign of  $UW$ , there are two possible interpretations. On the one hand, underwriters may act as information certifiers, consistent with the debt market explanations for intermediated private debt issues [see James (1987)]. In this case, the presence of an underwriter is expected to be inversely related to the probability of an IPO. Alternatively, as public offers involve identifying, co-ordinating and communicating with many potential subscribers, underwriters may be associated with diffuse distributions requiring intensive distribution effort. This implies a direct relationship between  $UW$  and the probability of an IPO<sup>14</sup>. Thus, the expected sign of  $UW$  is uncertain.

The effect of reputation on power is also well established. The cognitive sciences literature [cited by Wilkinson (1973, p6)] suggests that power may exist by perception, where there exists a common belief that an influential party can mediate benefits for another participant (reward power). These perceptions may result in an attachment of power and influence to the influential party over long periods of association (referent power). Both reward and referent power bases are equivalent to reputation influences frequently cited in the new equity literature, where empirical evidence suggests that reputation affects the level of underpricing<sup>15</sup>. Greater power exercised by underwriters may shape the distribution decision. For instance, underwriters that are renowned for issue certification may reduce information asymmetries through intermediation [see Booth & Smith (1986)]. Moreover, differential selling and distribution effort may be an increasing

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<sup>14</sup> For tractability, it is assumed that the underwriting decision takes place before the distribution choice decision (refer to Section 1.3 for further discussion).

<sup>15</sup> In particular, high reputation underwriters underprice less [see Logue & Lindvall (1974), Beatty & Ritter (1986), Johnson & Miller (1988), Carter (1990), Carter & Manaster (1990), Pettaway & Francis (1996), Balvers, McDonald & Miller (1988) and Carter, Dark & Singh (1998)].

function of underwriter reputation [see Gande, Puri, Saunders & Walter (1996)]. In each case, the probability of an IPO is expected to be directly related to underwriter reputation.

While rankings of underwriter reputation are commonly available in the United States [see Johnson & Miller (1988) and Carter & Manaster (1990)], they do not exist in Australia. Consequently, a measure of underwriter reputation is derived by assuming that each individual underwriter or broker in an issue participated equally in the offer. *REPUT* is then the underwriter's ranking by cumulative value of aggregated offerings over the sample window. The reputation of an underwriter increases with time and involvement, so that for a given issue listing on a particular date, the cumulative share of all business underwritten or sold prior to that date serves as a proxy for underwriter reputation<sup>16</sup>. It is expected that *REPUT* will be directly related to the probability of a public issue.

### 5.3 Sample Description

The complete model of distribution choice is summarised in Table 5.1. The model is estimated on a sample of 837 Australian new listings that made a primary equity issue prior to listing between January 1983 and June 1995<sup>17</sup>. To reduce the impact of extreme

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<sup>16</sup> This is a more sophisticated version of the Vos & Cheung (1992) measure of the total market share of the underwriter at the end of the period. One major limitation of the Vos & Cheung reputation rankings is that their proxy is forward looking. With the method adopted in this chapter there is no forward looking bias in *REPUT*. Measurement errors are anticipated for issues occurring early in the sample period but these measurement errors dissipate over time. Megginson & Weiss (1991) show that market share is highly correlated with Carter-Manaster ranking which rated underwriters on a 0-9 scale based on tombstone advertisements in newspapers. The Johnson-Miller rating used a 0-3 scale.

<sup>17</sup> Of the population of 1,351 new listings, 266 issues were excluded as a complete copy of the prospectus or information memorandum was not available. This large number of exclusions consists mainly of second board listings, and due to the discontinuation of this market, the historical record of the corporate disclosures for these firms is no longer publicly available. A further 248 issues are excluded where data was incomplete for one or more variables. These exclusions relate to the following omissions/non-disclosures: distribution mechanism (69), pre-listing profit (61), age (37), beta estimates and share price information (32), retail bank(s) (27), issue costs (13) and leverage (9).



**Table 5.1 A Summary of the Model of Distribution Method Choice**  
(Dependent Variable *IPODP* takes the value of unity if an IPO and zero if a DP).

THEMES	EXPLANATION	VARIABLE	PREDICTED SIGN
CORPORATE GOVERNANCE	OWNERSHIP	Founding Shareholders' Retention ( <i>RETENT</i> )	?
TRANSACTION COSTS	SIZE	Issue Size ( <i>LNSIZE</i> )	+
		<i>SQRDLN</i>	-
INFORMATION ASYMMETRY	(a) SIGNALS OF FIRM QUALITY	Asset Quality ( <i>NTAPS</i> )	+
		Industry ( <i>INDUS</i> ) ( <i>indus</i> =0, resource based=1)	-
		Quality of Accounting Procedures ( <i>AUDIT</i> )	+
		Growth Opportunities( <i>GROWTH</i> )	-
		Expected Level of Underpricing % ( <i>UPG</i> )	-
		Signal of Firm Quality ( <i>LEVERAGE</i> )	+
	(b) FIRM REPUTATION	<i>AGE</i> (in years)	+
		Past Performance ( <i>PROFIT</i> )	+
	(c) FIRM RISK	Financial Constraints ( <i>LEVERAGE</i> )	-
		OLS - <i>BETA</i>	-
		Standard Deviation of Returns over the First 30 Days of Trading ( <i>SD30</i> )	-
DISTRIBUTION CHANNEL STRUCTURE	COMPETITION	Number of Concurrent Issues ( <i>CONCUR</i> )	-
		Market Performance % ( <i>MKTRET</i> )	-
	INTERMEDIATION	Underwriter Control Variable ( <i>UW</i> )	?
	POWER OF THE INTERMEDIARY	Underwriter Reputation ( <i>REPUT</i> )	+

observations, outliers are truncated to values 5 standard deviations away from the mean<sup>18</sup>. However, due to extreme outliers, observations for the *GROWTH* variable observations are truncated at the 95 percentile.

Table 5.2 (Panel A) classifies the sample of firms according to the distribution method adopted for the issue and the firm's industry classification (industrial versus resource based). The sample consists of 679 (81.1%) initial public offers and 158 (18.9%) direct placements, of which 576 (68.8%) are industrial and 261 (31.2%) are resource-based issues. A larger proportion of resource-based firms (88.9%) adopt an initial public offer than industrial firms (77.6%) which is contrary to expectations. Panel B of Table 5.2 indicates that 699 (83.5%) of the issues were underwritten. Interestingly, a much higher proportion of IPOs are underwritten (92.9%) than direct placements (43.0%). Panel C decomposes the sample by board of listing. The second board markets in Australia provided an avenue for smaller firms to raise equity capital with diluted disclosure and listing requirements from 1984 to 1992, at which time the market was closed due to reduced trading activity and liquidity [see Australian Stock Exchange Limited, Annual Report (1992)]. Second board listings comprise almost a quarter of the sample (23.7%). IPOs were less commonly used by second board listings (57.1%) than main board listings (88.6%).

Summary descriptive statistics for the entire sample are provided in Table 5.3. The sample of 837 IPOs and direct placements has an average issue size of \$24.6M expressed

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<sup>18</sup> Regressions were also run across the sample without truncation but are not reported. The results are not influenced substantially by censoring the data.

**Table 5.2 Methods of Distribution**

**Panel A. Method of Distribution By Industrial Classification**

Type of Offering	Direct Placement	Initial Public Offer	Total
Industrial	129(15.4%)	447 (53.4%)	576 (68.8%)
Resource Based	29 (3.5%)	232 (27.7%)	261 (31.2%)
Total	158 (18.9%)	679 (81.1%)	837(100.0%)

**Panel B. Method of Distribution By Underwriting Adoption**

Type of Offering	Direct Placement	Initial Public Offer	Total
Underwritten Offers	68 (8.1%)	631 (75.4%)	699 (83.5%)
Non-underwritten Offers	90 (10.8%)	48 (5.7%)	138 (16.5%)
Total	158 (18.9%)	679 (81.1%)	837(100.0%)

**Panel C. Method of Distribution by Board of Listing**

Type of Offering	Direct Placement	Initial Public Offer	Total
Second Board	85 (10.2%)	113 (13.5%)	198 (23.7%)
Main Board	73 (8.7%)	566 (67.6%)	639 (76.3%)
Total	158 (18.9%)	679 (81.1%)	837(100.0%)

Source: Dissertation Database.

Table 5.3 Summary Descriptive Statistics (n= 837 issues)

Variable (Proxy)	Mean	Median	Range	Std Devn.	Skewness	Kurtosis
Dependent Variable (IPODP) - DP=0, IPO=1	0.8112	1	0.00 - 1.00	0.3916	-1.594	0.541
Total Assets (\$97M)*	160.383	8.085	0.0125-87.401 <sup>(u)</sup>	3035.19	28.489	819.346
Underswritten (UW)	0.84	1	0.00 - 1.00	0.37	-1.81	1.277
Number of Concurrent Issues (CONCUR)	69.9952	60	1.00 - 144.00	44.3631	0.303	-1.271
Market Performance % (MKTRET)	0.0119	-0.0259	-0.1900 - 0.7281	0.1678	3.19	10.343
Issue Size \$M 1997 (ln(SIZE))	15.6935	15.52	10.286 - 21.1054 <sup>(u)</sup>	1.418	0.501	1.105
Issue Size \$M 1997 *	24.643	5.499	0.293 - 1470 <sup>(u)</sup>	94.442	11.103	148.077
Total Issue Costs (ISSUEC)	0.7241	0.3	0.00 - 12.89 <sup>(u)</sup>	1.5931	5.484	34.705
Duration of the Offer Period to Trading (DURAT)	50.4897	29	1.00 - 366.00 <sup>(a)</sup>	52.6989	2.278	6.82
Expected Level of Underpricing % (UPG)	0.3183	0.1	-0.8400 - 7.9470 <sup>(a)</sup>	0.9301	5.3	35.716
Reputation of the Underwriter (REPUT)	0.3143	0	0.00 - 3.07	0.5322	1.653	2.957
Number of Underwriters in Syndicate ((NOUWS)	1.1171	1	0.00 - 5.00 <sup>(a)</sup>	0.7936	1.343	3.891
UW Exposure \$97 M (EXPOSE)	10.186	2.7	0 - 228.712 <sup>(u)</sup>	26.965	5.525	34.983
Quality of Accounting Procedures (AUDIT)	0.6965	1	0.00 - 1.00	0.46	-0.856	-1.269
Founding Shareholders' Retention (RETENT)	42.9408	46.6667	0.00 - 99.64	27.2099	-0.186	-0.891
Net Tangible Assets Per Share (NTAPS)	98.7165	41.675	0.00 -2,635.86 <sup>(a)</sup>	239.7601	7.931	76.043
Market / Book Value of Equity (GROWTH)	1.4477	0.7628	0.00 - 8.74 <sup>(c)</sup>	2.0664	2.69	6.297
Industry (industrial=0 , resource based =1) (INDUS)	0.3118	0	0.00 - 1.00	0.4635	0.814	-1.341
Firm Age (AGE)	6.2534	1	0.05 - 83.27 <sup>(b)</sup>	12.943	3.692	15.463
Firm Profitability (PROFITABILITY)	0.4636	0	0.00 - 1.00	0.499	0.146	-1.983
Firm Risk - Beta (BETA)	0.5744	0.4869	-3.49 <sup>(b)</sup> - 4.62 <sup>(a)</sup>	0.7896	-0.098	5.528
Firm Risk - Leverage (LEVERAGE)	0.8508	0.1946	-8.55 - 15.1578	2.123	4.699	26.991
Firm Risk - Std. Devn. first 30 day returns (SD30)	0.0454	0.0355	0.00 - 0.2152 <sup>(a)</sup>	0.0327	1.839	4.883

KEY: (a) Truncated at +5SD (b) Truncated at -5SD from the mean value (c) Truncated at 95% percentile (u) Unadjusted values indicating firm and issue size.

Source: Dissertation Database.

in 1997 dollars) while the average issuing firm has total assets of \$160.4M, is 6.25 years old, has a debt-equity ratio of 0.85, and a beta of 0.57. The issue is likely to be offered to investors at a time where there are 70 other listings undertaken within a three month period of listing. The duration of the offering, measured by the time in days that elapse between the opening and closing period of the offer, (or where the closing date is not disclosed, the date of listing) is 50.49 days<sup>19</sup>.

Table 5.4 provides summary statistics by the method of distribution, initial public offer or direct placement respectively<sup>20</sup>. Statistically significant differences between the means of each sample is indicated by t-statistics in the right hand column [see Kenkel (1996, p477)]. In terms of issue size and firm size (measured by total assets), initial public offers and direct placements are statistically similar. IPOs have a mean issue size of \$26.0M and firm size of \$186.5M compared with direct placements that have an average issue size of \$18.9M and an asset base of \$48.4M.

However, IPOs and direct placements are statistically different in a number of features. For example, consistent with the marketing distribution channel literature, IPOs coincide with less competition for equity funds by other issuers, *CONCUR*, and are less underpriced, *UPG*, consistent with the predictions of Maksimovic and Pichler (1998, p36). IPOs also exhibit a higher rate of underwriter adoption and syndication, while consistent

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<sup>19</sup> This figure is comparable to the 52.81 days for the period to listing indicated by Lee, Taylor and Walter (1994) for a sample of 266 industrial IPOs from January 1976 to December 1989.

<sup>20</sup> Comparative tables for underwritten issues, non-underwritten issues, small issues (less than the median issue size) and large issues (greater than the median issue size) are presented in Appendix IX. As previously mentioned, 84% of all issues are underwritten, and if underwritten, involve an average issue size of \$24.4M and an average number of 1.33 underwriters are involved in the issue. By comparison the average direct placement is marginally higher \$27.7M.

Table 5.4 Summary Descriptive Statistics by Distribution Method (n=837 issues)

Variable (Proxy)	Initial Public Offer (n=679)		Direct Placement (n=158)		Differences Between Sample Means (T-Statistic)
	Mean	Std Deviation	Mean	Std Deviation	
Total Assets \$M 1997*	186.452	3368.114	48.353	222.083	1.0586
Issue Size \$M 1997 *	25.983	101.000	18.881	58.683	1.1704
Founding Shareholders' Retention ( <i>RETENT</i> )	42.044	25.743	46.795	32.589	-1.7123*
Net Tangible Assets Per Share ( <i>NTAPS</i> )	87.275	224.510	147.886	292.279	-2.4443**
Industry (Industrial vs mining) ( <i>INDUS</i> )	0.3417	0.4746	0.1835	0.3883	4.4115***
Quality of Accounting Procedures ( <i>AUDIT</i> )	0.7054	0.4562	0.6582	0.4758	1.1318
Market / Book Value of Equity ( <i>GROWTH</i> )	1.5527	2.1526	0.9966	1.5729	3.7088***
Expected Level of Underpricing % ( <i>UPG</i> )	0.2515	0.8233	0.6055	1.2558	-3.3784***
Firm Age ( <i>AGE</i> )	6.4498	13.307	5.4094	11.2447	1.0100
Firm Profitability ( <i>PROFIT</i> )	0.4551	0.4983	0.5000	0.5016	-1.0147
Firm Risk - Leverage ( <i>LEVERAGE</i> )	0.8885	2.2316	0.6890	1.5688	1.3180
Firm Risk - Beta ( <i>BETA</i> )	0.5992	0.7655	0.4676	0.8804	1.7327*
Firm Risk - Std. Devn. first 30 day returns ( <i>SD30</i> )	0.0446	0.0312	0.0486	0.0386	-1.2136
Number of Concurrent Issues ( <i>CONCUR</i> )	66.851	44.460	83.506	41.437	-4.4869***
Market performance % ( <i>MKTRET</i> )	0.0121	0.1691	0.0111	0.1626	0.0691
Underwritten ( <i>UW</i> )	0.9300	0.2600	0.4300	0.5000	12.1921***
Reputation of the Underwriter ( <i>REPUT</i> )	0.3403	0.5442	0.2025	0.4621	3.2592***
Number of Underwriters in Syndicate ( <i>NOUW</i> )	1.2548	0.7515	0.5253	0.693	11.7246***
Issue Costs per Dollar Raised % ( <i>ISSUEC</i> )	0.0631	0.0549	0.0651	0.1299	-0.1672
Duration of the issue period to trading ( <i>DURAT</i> )	48.0833	51.1134	50.5935	82.8445	0.3650

Source: Dissertation Database.

KEY: \* reported in real 1997 dollars.

with the marketing distribution literature, the underwriters are on average more reputable. The issuing firms adopting IPOs are more likely to be resource-based, are of higher systematic risk, have a marginally lower ownership retention ratio, a lower net tangible asset backing per share, and greater growth opportunities than issuers using direct placements. With the exception of the *RETENT* variable, these relationships are inconsistent with the predicted signs of the corresponding variables summarised in Table 5.1.

Two additional variables, issue costs per dollar raised, *CPDR*, and a measure of the speed or efficiency of the offering, *DURAT*, are also reported in this table but not used in the regressions. Because these variables do not form part of the mandated disclosure requirement, for many observations they are unobservable<sup>21</sup>. The averages reported are generated from a sample of 759 (78 missing) and 580 (257 missing) observations respectively. The data indicates that, on average, the costs of distribution per dollar raised is similar with initial public offers costing 6.31% relative to 6.51% for direct placements. The subscription period between the distribution methods is also quite similar with IPOs taking approximately 48.08 days and direct placements 50.59 days.

The correlations between the variables used in the logit analysis are summarised in Table 5.5. *IPODP*, the distribution choice dependent variable, is highly positively correlated with issue size, the reputation of underwriters used, the resource based indicator variable, the market to book ratio of equity, and the presence of an underwriter. It is also

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<sup>21</sup> A loss of efficiency would result as a consequence of data unobservability if listwise deletion was used across all variables to define the sample [see Kofman & Sharpe (2000)].

Table 5.5 Matrix of Correlation Coefficients for Variables Used in the Analysis

VARIABLES	IPODP	RETENT	LNSIZE	SQDRLN	AGE	PROFIT	NTAPS	INDUS	LEVERAGE	BETA	SD30	AUDIT	GROWTH	UPG	CONCUR	MKTRET	REPUT
IPODP	1.000																
RETENT	-0.068*	1.000															
LNSIZE	0.179**	-.278**	1.000														
SQDRLN	0.166**	-.272**	.997**	1.000													
AGE	0.031	.126**	.260**	.274**	1.000												
PROFIT	-0.035	0.066	.235**	.239**	.255**	1.000											
NTAPS	-.099**	-0.058	.112**	.132**	.297**	.168**	1.000										
INDUS	0.134**	-0.005	-.123**	-.128**	-.173**	-.434**	-.164**	1.000									
LEVERAGE	0.037	0.020	.123**	.131**	.277**	.169**	.307**	-.167**	1.000								
BETA	0.065	0.015	0.056	0.051	-0.054	-.180**	-0.052	.370**	-.085*	1.000							
SD30	-0.048	0.033	-.249**	-.256**	-.217**	-.346**	-.152**	.408**	-.176**	.285**	1.000						
AUDIT	0.040	0.050	.190**	.192**	.103**	0.066	0.057	-.117**	0.052	-.093**	-.127**	1.000					
GROWTH	0.105**	-.120**	0.040	0.036	-0.052	-.119**	-.150**	.187**	.321**	0.051	0.039	-0.034	1.000				
UPG	-.149**	0.013	-.142**	-.139**	-0.047	-0.049	0.014	0.047	-.070*	.094**	.101**	-0.028	.242**	1.000			
CONCUR	-.147**	-0.061	-.106**	-.110**	-.225**	-.071*	-0.060	-0.063	-0.022	0.035	.221**	-0.023	.074*	.136**	1.000		
MKTRET	0.002	0.005	-0.013	-0.016	-0.010	-0.017	-0.009	0.009	-0.043	0.024	0.002	-0.034	-0.032	0.046	-0.013	1.000	
REPUT	.101**	-0.046	.415**	.423**	.122**	.113**	.071*	-.112**	0.053	0.055	-.131**	.092**	0.044	-0.008	0.049	-0.038	1.000
UW	.526**	-0.026	.236**	.217**	0.000	0.026	-0.046	.125**	-0.003	.140**	0.005	.120**	0.042	-.166**	0.021	-0.004	.263**

Note : \*\* indicates that the correlation is significant at the 0.01 level. \* indicates that the correlation is significant at the 0.05 level.

Source: Dissertation Analysis



negatively correlated with the expected level of underpricing, the number of concurrent issues, net tangible assets per share, and the retention level of the founding shareholders. However, only issue size, underwriter reputation, the level of underpricing and the number of concurrent issues are consistent with the signs predicted by the model specification in Table 5.1.

Overall, most of the variables are only weakly correlated, though many are significant. There are only three cases where the correlation between independent variables entering simultaneously in the regressions is, in absolute terms, greater than 0.4. The correlation between the issue size and underwriter reputation is 0.415, between industry and the standard deviation of daily returns for the first 30 days of trading is 0.408, and between industry and profit is -0.434.

#### 5.4 The Regression Results

As the choice of distribution method is binary, a logit analysis is used. The dependent variable, *IPODP*, representing the method of distribution, is a binary choice variable which is equal to unity for an initial public offer and zero for a direct placement. As noted in the previous chapter, the logistic regression is non-linear in *IPODP*, but is transformed into a linear model with respect to the natural logit, defined as the log odds of an outcome occurring with probability,  $\pi$ , that ranges from  $[-\infty, \infty]$  and is represented as

$\ln\left(\frac{\pi}{1-\pi}\right)$ . Hence, the general form of the logistic regression is :

$$\ln\left(\frac{\pi}{1-\pi}\right) = \hat{\beta}_0 + \hat{\beta}_1 X_1 + \hat{\beta}_2 X_2 + \dots + \hat{\beta}_n X_n + \hat{\epsilon}$$

where  $\beta_k$  represent the regression coefficients of the independent variables,  $X_k$  for  $k=1$  to  $n$ , and  $\hat{\epsilon}$  is the random error term.

A significant issue in the estimation of the model is the treatment of underwriter characteristics represented by the underwriter indicator variable, *UW* and the underwriter reputation variable, *REPUT*. In Section 1.3 of Chapter 1, it was assumed that the issuing firm, first, decides upon the underwriter, and then, determines the method of distribution. This sequence of decisions is consistent with both observations made by Pugel & White (1988) for a small sample of U.S. offers and informal telephone interviews with six investment advisors directly involved with the primary equity raising and corporate advice. In this framework, the *UW* and *REPUT* variables are treated exogenously in the estimation of the recursive model of distribution channel choice.

However, if it is believed that the underwriting and distribution choice decisions are simultaneously determined, then the inclusion of *UW* and *REPUT* in the distribution choice model would result in biased regression estimates [see Koutsoyiannis (1977)]. One way of overcoming this problem is to estimate a reduced form equation for distribution channel choice, in which the endogenous variables are excluded. In order to compare results generated by the different treatments of the underwriter variables, in the following sections we report results from alternative estimation procedures which we refer to as the recursive model and reduced form model respectively.

#### 5.4.1 Regression Results : The Recursive Form Model

The results of the recursive form model are summarised in Table 5.6 as Regressions 1 to 3. As *AGE* and *PROFIT* are viewed as alternative proxies for firm reputation and *BETA* and *SD30* are alternative risk measures<sup>22</sup>, only *AGE* and *BETA* are included in Regression 1<sup>23</sup>. Then in Regression 2, *PROFIT* substitutes for *AGE*, while in Regression 3 the firm risk proxy, *BETA* is replaced with *SD30*. The impact of underwriter reputation, *REPUT*, is considered in Regression 4A where it acts as a substitute variable for the underwriter indicator variable, *UW*, and in Regression 4B where *REPUT* is included as an additional variable to the specification of Regression 1. Finally, Regression 5 provides a linear specification for the impact of transaction costs.

The explanatory power of Regressions 1-3 are not statistically different from each other. Regression 1 correctly predicts 87.1% of the observations which is significantly better than a naive prediction that all observations are IPOs which correctly predicts 81.1% of observations.

Overall, the probability of an issue taking the form of an IPO increases with the firm's growth opportunities, the presence of an underwriter, and the firm being resource industry based, and decreases with the level of underpricing of the issue, the level of net tangible assets, and the number of concurrent issues in the market. Thus the results of

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<sup>22</sup> *LEVERAGE* is included in all models as it is considered a proxy for both firm risk and information asymmetry.

<sup>23</sup> This combination of proxies is the same as that reported in Chapter 4, Model 1.

**Table 5.6**  
**Results of the Logit Analysis (n=837)**

Dependent Variable : IPODP denoted as an Initial Public Offer (1), Direct Placement (0)								
THEME	VARIABLE	RECURSIVE MODEL						REDUCED FORM MODEL Regression 6 (no PROFIT)
		Regression 1 BETA, Age	Regression 2 replace Age with Profit	Regression 3 replace Beta with SD30	Regression 4A includes REPUT	Regression 4B includes REPUT & UW	Regression 5 without SQDRLN	
CORPORATE GOVERNANCE	RETENT	-0.0064 (2.2879)	-0.0050 (1.4234)	-0.0065 (2.3002)	-0.0023 (0.3814)	-0.0062 (2.1225)	-0.0067 (2.5010)	-0.0019 (0.2393)
TRANSACTION COSTS	LNSIZE	1.0924 (1.2063)	1.0346 (1.0884)	1.1398 (1.3194)	3.6924 (15.9867)***	0.9560 (0.9287)	0.0529 (0.3838)	3.5314 (13.8410)***
	SQDRLN	-0.0326 (1.0999)	-0.0294 (0.8997)	-0.0348 (1.2525)	-0.1105 (14.4638)***	-0.0274 (0.7710)	-	-0.1051 (12.4060)***
INFORMATION ASYMMETRY	NTAPS <sup>(a),2</sup>	-0.0009 (4.4616)**	-0.0009 (4.0449)**	-0.0009 (4.6701)**	-0.0006 (2.1242)	-0.0009 (4.4997)**	-0.0010 (6.0297)**	-0.0005 (1.1851)
	INDUS <sup>(a)</sup>	0.4517 (2.4482)*	0.3512 (1.3401)	0.5354 (3.3233)**	0.8228 (9.7776)***	0.4216 (2.1161)	0.4397 (3.3303)*	0.7058 (6.8775)***
	AUDIT <sup>(a)</sup>	-0.0933 (0.1439)	-0.0952 (0.1502)	-0.0971 (0.1560)	0.1958 (0.8703)	-0.1048 (0.1805)	-0.1091 (0.1983)	0.1921 (0.8299)
	GROWTH <sup>(a)</sup>	0.2270 (5.5731)**	0.2031 (4.5854)**	0.2243 (5.4818)**	0.2104 (5.5755)**	0.2245 (5.5476)**	0.2242 (5.5527)**	0.2079 (5.8081)**
	UPG <sup>(a)</sup>	-0.1796 (5.0076)**	-0.1658 (4.2436)**	-0.1846 (5.2583)**	-0.2717 (12.1170)***	-0.1727 (4.6761)**	-0.1765 (4.9132)**	-0.2473 (10.7521)***
	LEVERAGE <sup>(a)(c)</sup>	0.0480 (0.3831)	0.0751 (0.9183)	0.0449 (0.3302)	0.0592 (0.5818)	0.0488 (0.3981)	0.0470 (0.3744)	0.0545 (0.4936)
	AGE <sup>(b)</sup>	0.0088 (0.8942)	-	0.0083 (0.7872)	0.0045 (0.2638)	0.0083 (0.7993)	0.0079 (0.7604)	-0.0042 (0.2236)
	PROFIT <sup>(b)</sup>	-	0.02812 (1.2524)	-	-	-	-	-
	BETA <sup>(c)</sup>	-0.1004 (0.4496)	-0.1102 (0.5360)	-	0.0235 (0.0307)	-0.0937 (0.3890)	-0.0921 (0.3796)	0.0275 (0.0439)
	SD30 <sup>(c)</sup>	-	-	-4.8510 (1.9022)	-	-	-	-
	CONSTANT	-8.5906	-8.2880	-8.6644	-28.8384	-7.7579	-0.3953	-28.0914
DISTRIBUTION CHANNEL STRUCTURE	CONCUR	-0.0136 (26.0339)***	-0.0142 (29.0864)***	-0.0130 (23.0752)***	-0.0095 (17.5761)***	-0.0134 (25.2305)***	-0.0136 (25.9013)***	-0.0051 (4.5405)**
	MKTRET	0.2112 (0.0946)	0.1916 (0.0776)	0.1937 (0.0788)	0.2337 (0.1593)	0.1787 (0.0670)	0.2456 (0.1281)	0.1871 (0.0996)
UNDERWRITER CONTROL VARIABLES	UW	2.9732 (123.4157)***	2.9806 (123.4812)***	2.9571 (123.2845)***	-	3.0706 (117.1233)***	3.0317 (132.5428)***	-
	REPUT	-	-	-	0.5618 (6.0692)**	-0.2633 (1.2170)	-	-
	RETAIL <sup>+</sup>	-	-	-	-	-	-	0.2208 (1.1453)
	REGUL <sup>+</sup>	-	-	-	-	-	-	1.9207 (14.0607)***
	KNOWHOW <sup>+</sup>	-	-	-	-	-	-	0.1272 (0.2872)
	CONSTANT	-8.5906	-8.2880	-8.6644	-28.8384	-7.7579	-0.3953	-28.0914
Chi-square for the Model		249.355***	249.638***	250.732***	110.398***	250.539***	248.287***	125.908***
Chi-square for REPUT (relative to Reg <sup>a</sup> 1)		-	-	-	-	1.184	-	-
-2 Log Likelihood		561.587	561.304	560.210	700.544	560.403	562.655	685.034
Correct predictions (%)		86.50%	86.38%	87.10%	82.08%	86.50%	86.86%	81.60%
KEY: All Wald statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels respectively. NA - Not applicable. Explanations of Information Asymmetry include : (a) Signals of Firm Quality, (b) Firm Reputation, (c) Firm Risk. + denotes Chapter 4 variables.								

Source : Dissertation Analysis

Regressions 1 to 3 are supportive of the competitive influences and marketing risk explanations within the distribution channel framework. The probability of an IPO declines when competition between issues is high. However, there is little support for either the information asymmetry, corporate governance, or transaction costs hypotheses of distribution method choice.

Among the eight information asymmetry variables, the level of underpricing, net tangible assets, the resource industry indicator variable, and growth opportunities are statistically significant. However, only one, the level of underpricing *UPG*, has the predicted (negative) sign consistent with Table 5.1. Firms with greater asymmetric information, as proxied by larger underpricing, are more likely to use direct placements than IPOs. In contrast, net tangible assets per share, *NTAPS*, the industry indicator variable, *INDUS*, and growth opportunities, *GROWTH*, have incorrect positive signs. A possible explanation for the perverse *INDUS* result is that the sample includes a large number of entrepreneurial, investment and high technology firms that listed towards the end of the sample period. These industrial sectors are often more difficult to value than the standard manufacturing-based industrial firm. Thus in future research it would be desirable to include a somewhat narrower definition of industrial classification that would serve as a better proxy for information asymmetry. Moreover, the perverse result for *GROWTH* may be the result of difficulties in establishing a reasonable measure for the market to book ratio for equity close to listing. In determining this ratio, the market value is based on the last sale price on the first day of trading. It is possible that growth opportunities are better measured by market values established over longer time frames than a single day of trading.

Alternatively, the perverse result may be due to variable specification error. Ritter (1991) and Pagano, Pancetta & Zingales (1998) suggest that the relevant measure of growth may be relative to other firms operating in their industry. It is noteworthy that the perverse result for net tangible assets mirrors that of growth opportunities in that the correlation between *NTAPS* and *GROWTH* in Table 5.5 is significantly negative. As expected, firms with high growth opportunities have relatively low net tangible assets per share. Thus, the consistency of the perverse results for both *NTAPS* and *GROWTH* in Table 5.6 suggests the possibility that the underlying model specification in Section 5.2 could have overlooked an important aspect of the relationship between growth opportunities (or *NTAPS*) and the distribution choice decision. For example, Pagano, Pancetta & Zingales (1998, p41) note that because firms with many growth opportunities make large investments, they often choose an IPO to raise the necessary funding.

An interesting aspect of the recursive model results in Table 5.6 is that the distribution choice decision is independent of firm risk and reputation with *BETA*, *LEVERAGE*, *SD30*, *AGE* and *PROFIT* all statistically insignificant. However, the recursive model controls for the presence of an underwriter. As the underwriter variable is significantly and positively related to the probability of an IPO, the insignificant risk and firm reputation results are consistent with the presence of an underwriter alleviating investor concerns about the risk and reputation of underwritten firms.

The lack of support for the corporate governance hypothesis may be attributed to confounding influences. While the level of ownership retention variable, *RETENT*, may

act as a signal of firm quality, generating a positive relationship between *RETENT* and the probability of an IPO, this could be offset by a negative relationship if *RETENT* also serves as a proxy for the relative power of the founding shareholders and their concern with maintaining control rights.

Regression 4A considers the impact of underwriter reputation, *REPUT*, when substituted for the underwriter indicator variable, *UW*. *REPUT* is significant and positive at the 5% level, however, unlike the earlier results with *UW*, there is now strong support for the transactions cost hypothesis in terms of statistically significant coefficients on both *LNSIZE* and *SQRDLN*, with the linear term positive and the quadratic term negative. This suggests a ‘∩’ shaped relationship with the probability of an IPO increasing with issue size to a point where diseconomies of large issue sizes are encountered and the probability of an IPO declines. For Regression 4A, the maximum probability of an IPO occurs for an issue size of \$16.7M<sup>24</sup>. There is also a dramatic increase in the significance of the industry indicator variable, *INDUS*, though the sign of this relationship is contrary to the prediction in Table 5.1. Regression 4B then includes both the *UW* and *REPUT* variables and indicates that the former dominates the latter with *UW* highly significant and *REPUT* statistically insignificant. Moreover, the remaining coefficients mirror those in Regression 1 with transaction costs no longer statistically significant.

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<sup>24</sup> This estimate was determined by equating the partial derivative with respect to *LNSIZE* to zero:

$$\frac{\delta UW}{\delta LNSIZE} = 3.6924 - 2(0.1105)LNSIZE = 0.$$

Regression 5 is a modification of Regression 1 in that the quadratic transaction costs term is excluded from the regression. This has little effect on the results but highlights the fact that transaction costs remain statistically insignificant, even when assumed to be linear.

Finally, it is important to note that coefficient estimates in the recursive model only capture the ‘direct’ effect of the variable concerned on the choice of distribution method. If the variable is also a determinant of the underwriting decision, as modelled in Chapter 4, then the variable may be said to have an ‘indirect’ effect on the choice of distribution method through influencing the probability of underwriter demand. Thus, reported differences in the recursive form and the reduced form model results may be attributable, in part, to this feature of the recursive model. To illustrate, the ‘direct’ effect of the *GROWTH* variable in the recursive model of Regression 1 is significant and positive. However, *GROWTH* also has a strong and negative ‘indirect’ effect on distribution choice through the underwriter decision in Model 1 of Table 4.5 in Chapter 4. Thus, the ‘indirect’ effect of *GROWTH* on the choice of distribution method, through the positive coefficient on *UW* in the recursive model, is negative. The sum of the positive ‘direct’ and negative ‘indirect’ effects of the *GROWTH* variable will therefore tend to be offsetting, with the coefficient on the *GROWTH* variable in the reduced form model being less than the corresponding ‘direct’ effect reflected in the recursive model coefficient.

#### **5.4.2 Regression Results : The Reduced Form Model**

The results of the reduced form model, corresponding to that of Regression 1, is shown in Table 5.6 as Regression 6. Essentially the reduced form model augments the



Regression 1 variables with variables incorporated in the preferred model of underwriter demand featured in Chapter 4 (Table 4.5, Model 1). An examination of the summary statistics for Regression 6 reveals that, relative to the recursive models, the reduced form has less explanatory power with only 81.6% correctly predicted observations. This compares poorly with the naive prediction that all observations are IPOs. Moreover, the chi-squared statistic for Regression 6 is significantly smaller than for Regression 1.

The evidence from the reduced form estimates generally provides support for the transaction costs and marketing risk explanations of distribution choice. However, there is at best only very weak support from the asymmetric information explanation with the probability of an IPO inversely related to underpricing.

A comparison of the coefficients common to the recursive and reduced form models in Regressions 1 and 6 reveals that the treatment of the underwriter control variables as either exogenous or endogenous respectively has a significant influence on the results. This is particularly so for transaction costs and several of the information asymmetry variables. While transaction costs are significant at the 1% level in the quadratic form in Regression 6, they are insignificant in Regression 1<sup>25</sup>. Thus, in the reduced form, the relationship between issue size and the probability of an IPO is ‘ $\cap$ ’ shaped, where extremely small and extremely large sized issues have a lower probability of IPO adoption than intermediate sized issues. In this case, the maximum probability of an IPO is associated with an issue

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<sup>25</sup> The significance of transaction costs also appears in Regression 4, where the underwriter indicator variable, *UW*, is replaced with a measure of underwriter reputation, *REPUT*. This result suggests that the *UW* is capturing joint influences of size and industry.

size of A\$16.80M<sup>26</sup>. This is a similar result to the maximum probability of an IPO as estimated from Regression 1 of \$16.75M and that reported earlier for Regression 4A.

With respect to the information asymmetry variables, the main difference between the reduced form and the recursive models relates to the net tangible assets per share and the resource indicator variables. Whereas *NTAPS* has a significant negative ‘direct’ effect at the 5% level in the recursive model, it is insignificant in the reduced form. This is due to offsetting negative ‘direct’ and positive ‘indirect’ effects. On the other hand, the resource industry indicator variable is significantly more positive in the reduced form in Regression 6 than in the recursive model in Regression 1. In this case the ‘direct’ and ‘indirect’ effects reinforce each other. However, as noted previously, the significant positive coefficient on the industry indicator variable, *INDUS*, is inconsistent with the anticipated sign in Table 5.1.

The remaining information asymmetry variables show little difference between the recursive and reduced form results. Underpricing, *UPG*, has an anticipated negative coefficient and is more significant in the reduced form result reflecting reinforcing ‘direct’ and ‘indirect’ effects. Growth opportunities, *GROWTH*, has an incorrect and significant positive coefficient in the reduced form which is contrary to evidence in the debt market

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<sup>26</sup> This estimate was determined by equating the partial derivative with respect to *LNSIZE* to zero:

$$\frac{\delta UW}{\delta LNSIZE} = 3.5314 - 2(0.1051)LNSIZE = 0.$$

literature [see Houston & James (1996)]. However, it is consistent with the prediction of Pagano, Pancetta & Zingales (1998, p41) that firms with large growth opportunities make large investments, and often choose an initial public offer to raise necessary funding. As in the recursive model results, the firm risk and reputation variables, *BETA*, *LEVERAGE* and *AGE* remain insignificant. In the case of *BETA* a significant positive ‘indirect’ effect on the demand for underwriting is offset by an insignificant negative ‘direct’ effect to produce an insignificant reduced form result.

Another feature of these results is that the distribution channel structure variable, the number of concurrent issues *CONCUR*, retains its anticipated negative sign. However, the statistical significance of this variable falls from 1% in Regression 1 to 5% in Regression 6, with an insignificant positive ‘indirect’ effect through *UW* providing some offsetting influence on the strong negative ‘direct’ effect of the recursive model.

Finally, the corporate governance variable, ownership concentration of the founding shareholders, *RETENT*, is insignificant in both recursive and reduced form models.

### 5.4.3 Logit Regression Stability

A test of model stability was undertaken to ascertain whether the estimated recursive and reduced form models were stable across small and large issues. These tests examine whether the behavioural parameters of the model vary depending on issue size. Each parameter is allowed to have a fixed and a variable component:

$$B_i = \mu B_i + \sigma B_i \cdot \text{SIZED}_i \quad (5.1)$$

where the f and v subscripts indicate fixed and variable parameters respectively and SIZED is an indicator variable taking a value of unity if the issue size is less than the median value of \$5.5M. The effect of this specification is to incorporate each explanatory variable  $X_i$  in linear as well as multiplicative form ( $\text{SIZED}_i \cdot X_i$ ). The fixed coefficients are those on the linear variables and are interpreted as those applicable to large issues when  $\text{SIZED}=0$ . The variable coefficients on the multiplicative terms provide a test of whether the effect of the  $X$  variable on the dependent variable is different between small and large issues. The coefficients for small issues, when  $\text{SIZED}=1$ , are obtained by summing the fixed and variable coefficients. The coefficients obtained this way are identical to those obtained when estimating separate models on sub-sample data relating to small and large issues respectively. Note, however, the standard errors of the parameter estimates are larger, and t-statistics are smaller, when estimated separately on subsets of the data than in the variable coefficient model.

Table 5.7 presents the results of the SIZED variable coefficient for both the recursive and reduced form models. Where the small issue parameter estimate is different from the large issue parameter, this is shown by '#' on the t-statistic of the parameter. The issue size interaction terms are jointly statistically significant at the 5% level in the recursive model, suggesting that the model of distribution choice is significantly different for small and large issues. However, in the reduced form model, the interaction terms are statistically insignificant.

**Table 5.7**  
**Results of Logit Analysis - Differential Issue Size**

Dependent Variable : IPODP denoted as an Initial Public Offer (1), Direct Placement (0)					
THEME	VARIABLE	RECURSIVE		REDUCED FORM	
		Small Issues	Large Issues	Small Issues	Large Issues
CORPORATE GOVERNANCE	RETENT	-0.0192*** (8.7337)###	0.0095 (2.2723)	-0.0124** (5.0002)	0.0131*** (4.4804)###
TRANSACTION COSTS	LNSIZE	2.0532 (0.8794)	2.6007 (0.8905)	3.7059* (2.7279)	4.0547 (2.1292)
	SQRDLN	-0.0717 (0.8259)	-0.1717 (0.8259)	-0.1165 (2.1408)	-0.1165 (2.1408)
INFORMATION ASYMMETRY	NTAPS <sup>(a)</sup>	-0.0012** (3.9347)	-0.0014* (2.9982)	-0.0004 (0.4377)	-0.0013 (2.3008)
	INDUS <sup>(a)</sup>	0.7464* (3.2416)	0.1473 (0.1025)	0.9966*** (7.7755)	0.2484 (0.3082)
	AUDIT <sup>(a)</sup>	0.1918 (0.3272)	-0.3512 (0.7877)	0.4131 (2.3136)	-0.0671 (0.0336)
	GROWTH <sup>(a)</sup>	0.2372 (2.5871)	0.1620 (1.3029)	0.2623** (4.3980)	0.1126 (0.8181)
	UPG <sup>(a)</sup>	-0.2815** (4.9476)	-0.1543 (2.0223)	-0.3493*** (9.7294)	-0.1809* (3.3384)
	LEVERAGE <sup>(a)</sup>	0.0723 (0.2847)	0.0877 (0.4699)	0.0713 (0.3500)	0.1159 (0.6774)
	AGE <sup>(b)</sup>	-0.0136 (0.3999)	0.0103 (0.6425)	-0.0108 (0.4609)	-0.0010 (0.0061)
	PROFIT <sup>(b)</sup>	-	-	-	-
	BETA <sup>(c)</sup>	-0.1364 (0.4914)	-0.2173 (0.6101)	0.0291 (0.0338)	-0.1241 (0.1966)
	SD30 <sup>(c)</sup>	-	-	-	-
DISTRIBUTION CHANNEL STRUCTURE	CONCUR	-0.0176*** (17.1374)	-0.0116*** (10.4234)	-0.0064* (3.6486)	-0.0046 (1.5153)
	MKTRET	2.9104** (5.3138)###	-1.2840 (2.5539)	1.2135 (1.5877)	-0.7841 (0.9574)
UNDERWRITER CONTROL VARIABLES	UW	3.5253*** (80.4136)	2.5048*** (32.9780)	-	0.3902 (1.4743)
	REPUT	-	-	-	-
	RETAIL	-	-	-0.0151 (0.0028)	0.3902 (1.4743)
	REGUL	-	-	2.3529** (5.0871)	1.7326*** (7.6610)
	KNOWHOW	-	-	-0.2906 (0.5658)	0.0216 (0.0026)
	CONSTANT	-13.6981	-22.7952	-27.6393	-33.7955
Number of Observations (n)		837		837	
Chi-square for the Model		273.834		147.248	
Chi-square for INTERACTION terms		24.479**		21.340	
-2 Log Likelihood		537.108		663.694	
Correct predictions (%)		87.22%		83.15%	
KEY: All Wald statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels respectively on variables and ###, ## and # represent the significance on the interaction terms.					

Source: Dissertation Analysis

When the underwriter control variables are treated exogenously, as in the recursive model, the conclusions drawn from the variable coefficient model are similar to those described for Regression 1, with the following exceptions. First, the corporate governance variable, *RETENT* is highly significant for small issues but not for large issues. These results suggest that corporate governance considerations are important for small issues with high levels of founding ownership retention. In order to maintain control, the existing owners have strong preferences for direct placements of shares rather than a public offer. Second, the distribution channel variable, *MKTRET*, is positive and statistically significant for small issues but insignificantly negative for large issues. The positive coefficient is inconsistent with the expected sign from Table 5.1 and suggests that when market returns are high, then smaller issues have a higher probability of choosing an IPO.

Third, the growth opportunities variable, *GROWTH*, which was significantly positive across the full sample, is no longer significant across issue sizes. Fourth, the underpricing variable, *UPG*, retains its correct negative sign across the sub-samples, but is now only statistically significant for small issues. Finally, the perverse positive *INDUS* coefficient appears to be a small issue phenomenon.

## **5.5 Conclusion**

This chapter has examined an issuing firm's choice of distribution method. In Australia, a firm listing on the stock exchange may use either an initial public offer or a direct placement to raise primary equity. An analysis of the summary statistics of the distribution methods finds that on average, IPOs are more likely to be underwritten, have more reputable underwriters and involve underwriter syndication than direct placements.

They are also likely to exhibit higher systematic risk, have greater growth potential, are more likely to be resource-based, have lower net tangible assets per share, and a lower level of founding shareholders retention than direct placements. Moreover, IPOs are more likely to be offered in 'cooler' market periods when the number of concurrent issues competing for funds is lower and issues are less underpriced.

A model is formulated based on corporate governance, transaction costs, information asymmetry and channel distribution explanations for distribution choice. This model is estimated as a recursive model and also in reduced form. The formulation of the recursive model is consistent with the assumption that the issuing firm first decides upon the underwriter, and then determines the method of distribution. The sequence of decisions is consistent with both observations made by Pugel & White (1988) for a small sample of U.S. offers and informal telephone interviews with investment advisors directly involved in the primary issue market in Australia. On the other hand, the reduced form model is consistent with the underwriting and distribution choice decisions being made simultaneously. The results from the logit analysis provide support for the transaction cost and the marketing risk hypotheses, and for small issues only there is evidence for the corporate governance hypothesis, however, there is little support for firm reputation and information asymmetry explanations. The stability tests of model specification across issue size also find that the recursive model is unstable across small and large sized issues, however, in reduced form there is little evidence of size instability.

## **CHAPTER 6**

### **SUMMARY & CONCLUSIONS**

#### **6.1 Introduction**

This research focuses on primary equity raisings by firms that seek to list on the stock exchange. Primary equity raisings are made prior to stock exchange listing and provide the issuing firm with an increased equity base. However, they differ from secondary or seasoned issues, as the shares have not been publicly traded. Consequently, the valuation of the newly created shares by active market and public trading is yet to be established.

Very few published studies have examined the sequence of decisions in the primary equity formation process, or the determinants of those decisions. The absence of empirical studies on the underwriting and distribution choices appears attributable to the absence of appropriate theoretical models explaining relevant choices and to limitations in the coverage of existing databases. Thus the primary objective of this dissertation was to enhance our understanding of several decisions relating to primary equity raising and stock exchange listing. This objective has been achieved through several contributions.

#### **6.2 Contributions of this Research**

First, scant attention has been paid in prior research on the processes and decisions underlying primary equity formation in Australia. Chapter 2 provides a description of the institutional framework and the sequencing of decisions within that



process. In addition, the different ways in which primary equity can be raised is reviewed. The discussion identifies conceptual differences between the Australian and U.S. institutional environments. In particular, the restrictions on the public sale of equity sourced from private and institutional investors under SEC Rule 144 do not exist in Australia. Knowledge of these differences is important as a large proportion of the published literature on primary issues, specifically IPOs, focusses on U.S. evidence. Consequently, many of the theories derived with U.S. institutional characteristics may not be directly relevant to non-U.S. environments. The identification of the sequence of decisions is also important to the presentation and structure of Chapters 4 and 5, as the sequence of decisions provide support for the estimation approach adopted when multiple and related decisions are made at the time of listing. This background is provided to motivate the public versus private equity funding choice considerations analysed in Chapter 5.

Second, at the time this research began, no commercial database existed on new equity raisings that provided sufficient detail to undertake the analysis presented in this dissertation. Since then, commercial resources have been devoted to the development of Australian databases relating to primary equity raisings. However, being relatively new, these databases are limited in scope and coverage, and do not span more than a five year period. More often, they consist of a limited number of data items or scanned text items which are unsuitable for immediate analysis. Further, the analysis of decisions made within the equity formation process often requires variables that are generally unavailable or haphazardly collected in commercial data without regard for uniformity or completeness. It was therefore necessary to design and compile a database that would

meet the analytical needs of the research questions posed. The derivation of the database is described in Chapter 3, where it is used to provide a descriptive overview of the primary equity market in Australia.

The database covers 1,351 new issues (91.7% of the population of new listings sourced from Australian Stock Exchange records) from January 1983 to June 1995, and was compiled so as to allow empirical testing of theoretical models relating to the demand for underwriting services and the determinants of distribution choice. The coverage of this dataset is considerably wider than that reported in other Australian IPO studies, in terms of the period covered and the inclusion of issues with smaller offer prices. Moreover, the database is extended to include equity issues via direct placement as well as IPOs. Also as a consequence of limited data on underwriter rankings and the participation rates of auditors, estimates of cumulative market values for both types of agents in the issuance process are determined. These allow proxies for underwriter and auditor reputation to be derived and incorporated within the modelling of equity formation decisions.

Comparative statistics for the Australian primary equity market related to the value of gross proceeds raised, the level of underpricing and costs of flotation are provided. The sample of 1,351 primary issues accounts for A\$31.5M (1997 dollars) of equity raised. On average, these issues are underpriced by 41.2%, although, comparative statistics for issues with an offer price greater than \$1 are underpriced by only 14.6%. This result is comparable to previously reported research. Based on a subset of 952 issues reporting formation costs, the average flotation cost per dollar

raised for the sample is 7.88%

Two theoretical models are formulated, identifying factors influencing the demand for underwriting services (Chapter 4) and the choice of the method of distribution (Chapter 5). These models provide extensions of the existing literature, with each decision being modelled in the context of the unique features of the institutional environment in Australia.

Third, this study enhances our understanding of the underwriting decision in primary equity issues through an examination of the demand for underwriting services in equity markets. Prior literature on underwriting services for primary equity issues has focussed upon the choice between best efforts and firm commitment underwriting contracts [see Mandelker & Raviv (1977), Baron (1979, 1982), Ritter (1985), Bachar (1998), Cotter & Thomas (1998) and Dunbar(1998)]. There is an implicit assumption in this literature that all issues are underwritten. However, in Australia only 83% of the issues are underwritten. A theoretical base for the underwriting decision is found in the financial intermediation literature. Thus, in Chapter 4, a model of underwriter demand largely based on the determinants of financial intermediation in the debt markets is specified and estimated using a binary choice logit analysis. The model is based on transaction costs, information asymmetry, liquidity, risk transfer/avoidance explanations for underwriter demand. Prior research suggests that the demand for underwriting services is higher when firm size or issue size is small, when there is greater information asymmetry and risk, and lower firm reputation and liquidity.

The estimates of the underwriter choice model indicate that, consistent with the predictions of Chemmanur & Fulgheri (1994), there is an inverted-U shaped relationship between underwriter adoption and issue size (the transaction cost proxy). Very small and very large issues are less likely to adopt an underwriter. Moreover, the probability of an underwritten issue is maximised at an issue size of A\$41M (1997 dollars). The liquidity motivation is also found to be significant, where more liquid issues (those attractively discounted) are less likely to require the services of a financial intermediary. Consistent with the theory of financial intermediation, firms with higher systematic risk are also more likely to adopt underwriters. Support for the information asymmetry hypothesis is weak, with only one of six proxies significant and of the predicted sign. Relatively opaque, resource-based firms are more likely to demand underwriting services than industrial firms. Finally, there is little support for the firm reputation hypothesis. However, this lack of significance may be attributable to the fact that firm reputation proxies are highly correlated with other statistically significant variables (size and industry) in the regression.

Fourth, firms listing on the Australian stock exchange can source new equity from the public in an initial public offer or from institutional and private investors through a direct placement, provided that the stock exchange listing rules are met. In the Australian context, both distribution methods result in stock exchange listing. This situation is significantly different from the U.S. where an offer to private and institutional investors is prohibited from being publicly traded. Prior international studies of distribution choice have therefore focussed on the net benefits associated with stock exchange listing [see Ellingsen & Rydqvist (1997) and Pagano, Panetta &

Zingales (1998)]. However, in the Australian environment, an investigation of distribution choice by publicly listed firms can assume the 'going-public' decision as given, and can focus on factors other than stock exchange listing as the determinants of a firm's preferred source of new equity funding.

Despite the institutional differences between the U.S. and Australia, the model of distribution choice formulated in the U.S. context by Ellingsen & Rydqvist (1997) identifies several influences that are consistent with the framework developed in Chapter 5, such as transaction costs, information asymmetries, and liquidity. However, they do not explicitly account for corporate governance considerations or marketing influences on the choice of distribution method. In referring to corporate governance, researchers acknowledge that shareholders are heterogeneous. Depending on the size of the stake held by the shareholders and/or shareholder type, investors are expected to possess different monitoring capacities which alter the firm's preferences for initial ownership structure when maximising gross proceeds [see Zingales (1995), Mello & Parsons (1998), Stoughton & Zechner (1998) and Maksimovic & Pichler (1999)]. Other studies with a corporate governance focus consider that the level of founding shareholder interest retained is positively related to firm value [see Downes & Heinkel (1982)] or to the degree of moral hazard [see Gomes (2000)]. While these models attempt to capture corporate governance influences, the context of these studies refers entirely to allocation decisions for public offers, rather than considering how corporate governance influences the public versus private funding decision.

Marketing explanations of distribution choice suggest that the degree of competition in the primary equity market affects distribution choice. Competitive forces can be captured in terms of the competition between new issues offered at the same time or in terms of the competition between alternative investment strategies. Hence, the distribution choice model is based on an amalgam of cross-disciplinary literatures in finance and marketing. The survey of this literature predicts that distribution choice is expected to be related to corporate governance, transaction costs, information asymmetries and marketing distribution/channel structure influences.

The logit analysis is estimated using both a recursive model and a reduced form model. The former characterisation is consistent with the assumption that the influence of underwriting demand is exogenous to the distribution decision. Consequently, the influence of the underwriter is captured by the inclusion of an underwriter indicator variable and/or a measure of underwriter reputation. Alternatively, when underwriting influences are assumed endogenous, the variables in the specification of the preferred equation for the demand for underwriting services in Chapter 4 are included in the model.

The results of these two estimation procedures yield different results. The research findings suggest that the choice of distribution method is largely determined by competition in the market for primary issues. On average, direct placements made to small sets of concentrated private and institutional investors are more popular in hot markets (when the degree of marketing competition is high), providing additional support for optimal timing of issues [see Ritter (1991)]. When the underwriter indicator

variable is excluded from the model there is strong support for the transaction costs hypothesis, where the probability of an IPO is more pronounced for intermediate issue sizes. However, when the underwriter indicator variable is included in the model, there is no support for the transaction cost hypothesis, irrespective of whether a linear or quadratic form is assumed. In terms of the information asymmetry explanation for distribution choice, there is dismal support, with only the level of underpricing significant and of predicted sign.

### **6.3 Future Research**

There are several avenues for future research that follow from the present study. These aspects can be classified in terms of improvements in methodology, research issues that lie outside the scope of the present research but are easily contained within the dataset and natural extensions that relate to aspects of this research involving new data collection. Finally, there are implications for other research not related to primary equity formation.

#### **6.3.1 Methodology Improvements**

This research assumes that decision making is sequential where the underwriting decision precedes the choice of distribution method. An alternative modelling framework could assume that the decisions are made simultaneously. However the estimation of such a model is fraught with identification problems as the determinants of underwriting and distribution method as specified in Chapters 4 and 5 are very similar. Thus, the successful implementation of a simultaneous model will require further consideration of the underlying structural models.

Listwise deletion is a common practice in the treatment of missing observations in Finance. This method only considers observations that have complete data and observations. Any observations with missing variables or proxies are removed from the sample. From a methodological perspective, the listwise deletion of observations may yield inefficient and/or biased parameter estimates [see Kofman & Sharpe (2000)]. As this research uses listwise deletion to identify the final sample of observations for the empirical analyses, the potential for biased results should be further explored.

Some of the proxies used in this analysis were found to be insignificant, or of incorrect sign. However, the precision of the proxy might be improved. One of the variables where the potential for improved formulation may be beneficial is the industry indicator variable. Although this classification method is commonly used as a proxy for asymmetric information or risk in many empirical studies, there is some evidence to suggest that a simple dichotomy between industrial and resource-based firms might be too elementary. For example, in the industrial classification, high technology and internet start-ups are proving to be more difficult to value than a standard manufacturing firm. Similarly, resource explorers are considered to be more difficult to value than a 'producing' resource firm. There could also be problems with the growth opportunity variable, measured by the market to book ratio of equity. Prior studies have suggested that while the market to book ratio provides an indication of the growth potential of an individual firm, what is more relevant in decision making is a relative growth measure that is related to average or median firm performance [see Ritter (1991) and Pagano, Pancetta & Zingales (1998)]. Cautionary warnings about growth measures are also made in studies unrelated to primary offers [see Fama & French (1999)] where it is



suggested that any longitudinal study that includes new listings in the sample has a significant destabilising influence on intertemporal measures of growth through changing firm characteristics and stock market composition.

### **6.3.2 Extensions to the Scope of Current Research**

The scope of this research has been limited to a study of primary equity decisions made by firms about to list on the stock exchange. Two particular formation decisions in this process have been investigated, namely the demand for underwriter services and the distribution choice decision. The investigation of underwriter and distribution choice in the context of unlisted firms or well traded firms already listed on the stock exchange (i.e. seasoned firms) has been conveniently ignored.

In addition, other issue and flotation decisions have been ignored. These decisions include other aspects of flotation and listing such as the use of bookbuilding, the determinants of underwriter costs, and whether or not the firm chooses to switch auditor prior to listing. Bookbuilding has only been adopted in Australia since 1993, and even now, too few bookbuilding adopters exist for a study of Australian bookbuilding efforts to be meaningful. While recent research has considered this choice [see Benveniste & Busaba (1997) and Biais & Faugeron-Crouzet (1998)], a comparative analysis has not been undertaken using Australian data. The determinants of underwriter fees is a natural extension of the present research into equity formation decision making [see McDonald (1992), Nanda & Warther (1998), Chen & Ritter (1999), Hansen (1999) and How & Yeo (1999)]. Further, Australian prospectuses provide detailed information on the structure of the underwriting contract, that is not

reported in the U.S. As the link between underwriter reputation and remuneration has not been identified in prior investigations [see Benveniste & Busaba (1997)] an analysis of optimal compensation payments along the lines of McLaughlin (1992) would be of interest.

### **6.3.3 Implications for Other Research**

The research undertaken in this dissertation also has implications for future research outside the topic of primary equity formation. This database permits an investigation of the effect of reputation signalling of the auditor, underwriter and issuing firm on the long-run performance of the issuing firm. Given the differences in underwritten versus non-underwritten issues and the noticeable variations in distribution method choice, a natural extension of this research is to consider how these flotation choices affect firm performance over a longer time horizon. If underwriters provide a necessary and valued intermediation function and form meaningful long term relationships, then the efficient access to equity funds would be a likely determinant of future performance. Logue, Rogalski, Seward & Foster-Johnson (1999, p3, 30) propose that the long term performance issues need to account for the underwriting process taking into consideration its 'sequential' and 'integrated' nature.

Another extension of this research involves an examination of the linkage between primary and secondary equity offers. It would be of interest to establish the basis underlying secondary offers and to examine the relevance of the models developed in this study to decisions made in secondary offers.

Little research has been undertaken in relation to whether seasoned equity raisings are cyclical in nature or related to the success of the primary equity raising [see Welch (1996)], and a survey of Australian research suggests that such analysis has not been undertaken. Research in the U.S. has explored the possibility of underwriter switching between the primary and subsequent equity offers [see Krigman, Shaw & Womack (1999)]. No current research has been identified which examines medium to long term credibility and reputation signalling in Australia. This research could involve an extension of the debt market literature examining the development of specific-relationship assets [see James (1992)] and impediments to efficient capital raising introduced by the presence of hold-up costs and other inefficiencies [see Rajan (1992)].

One of the more concerning aspects of the public trading of shares for a firm is that its ownership structure is more exogenously determined than if equity in the firm was privately held. Aspects of corporate governance are therefore important to new listings as over time it is observed that some new listings are taken over by other firms or delisted for varying reasons. Thus, a longitudinal study could examine the determinants of potential failure versus survival of these new listings. A preliminary investigation using survival analysis on a small sample of firms was undertaken using Australian data from 1983-1988 [see Woo, Jeffrey & Lange (1995)]. However, changes in the consistency of listings (such as internet and high technology), the impact of the stock market crash of 1987, and changes to stock exchange listing rules (avoiding cash-box listings) may be influential factors for firm longevity.

Finally, the present research makes a contribution by way of examining aspects of corporate governance on formation decisions. Stoughton & Zechner (1998) and Mello & Parsons (1998) suggest that the choice of shareholder type in the establishment of the initial ownership structure of the firm matters when it goes public. Corporate governance issues were found to be significant for small equity raisings with large retention ratios in distribution method choice. However, as the firm grows and its equity base expands, one consequence of this result is that its ownership structure is likely to vary. An interesting issue is the extent to which decisions made within the primary equity formation process may affect future changes. There also is the opportunity for future research to consider whether changes in ownership structure or institutional involvement impact on long-term performance. This aspect has been examined in the U.S. [see Kothare & Rao (1999) and Jain & Kini (1999)] but not in the Australian context. If there is an optimal initial ownership structure which maintains or confers control rights to effective monitors of managers of public corporations, then we should expect to find long-term differences in firm performance.

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## Appendix I

### An Example of a Tiered Offer (Woolworths Limited)

#### The Structure of the Offer

A total of 1,000 million fully paid ordinary shares of \$0.25 per value are offered for sale pursuant to the Offer. This represents all of the issued capital of the Company. Except in the cases of Shares bid for pursuant to the Institutional Offer (see below), payment in respect of the Shares is to be made in full on Application.

The Offer is in four parts:

(1) **The Public Offer**, pursuant to which Applicants will apply to acquire Shares at the Application Price of \$2.45 Share. The Public Offer is open to all members of the public in Australia and New Zealand. Further details are set out in "The Public Offer" below

(2) **The Institutional Offer**, pursuant to which Australian and New Zealand Institutions and international investors are invited to bid or submit indications of interest to acquire Shares at prices in a range from \$2.15 to \$2.45 (inclusive). Further details are set out in "The Institutional Offer" below.

(3) **The Entitlement Offer**, pursuant to which shareholders in the Parent Companies are entitled to apply to acquire approximately 48.82% of the Shares at the Application Price of \$2.45 per Share. Further details are set out in "The Entitlement Offer" below.

(4) **The Employee Offer**, pursuant to which up to 1.0% of the Shares will be reserved for eligible Woolworth's employees at the Application Price of \$2.45 per Share. Further details are set out in Section 7 under "Employee Share Plan"

Shares not taken up pursuant to the Entitlement Offer or the Employee Offer will be made available to satisfy Applications pursuant to the Public Offer and the Institutional Offer.

The number of Shares is fixed and there is no mechanism for the Offer to be increased in size.

The Final Price which will be not less than \$2.05 per share and not more than \$2.45 per Share, will be determined as set out in "Determination of the Final Price" below. The Final Price will be the same for all Shares sold pursuant to the Offer.

The Offer has not been underwritten.

## **The Offer Period**

The opening date for Applications under the Public, Entitlement and Employee Offers is 9 June 1993 at 12.00 noon Sydney time. The opening date of the Institutional Offer is 23 June 1993, at 9.00am Sydney time.

The closing dates for the Offer are as follows:

- \* the Entitlement Offer - 25 June 1993 at 4.00 p.m. local time.
- \* the Employee Offer - 28 June 1993 at 4.00 p.m. Sydney time.
- \* the Public Offer - 5 July 1993 at 4.00 p.m. at local time.
- \* the Institutional Offer - 9 July 1993 at 5.00 p.m. Sydney time.

The vendor reserves the right to vary the closing dates for the Public Offer and the Institutional Offer with the prior approval of the Joint Lead Managers.

**The Public Offer** @ \$2.45 per Share

## **The Institutional Offer**

### **Bidding Process**

The Vendor invites Institutions to submit bids or indications of interest for Shares. Bids by Institutions in Australia and New Zealand must:

- \* be for at least 100,000 Shares;
- \* indicate the number of Shares that the Institution wishes to purchase at each different price within the range of \$2.15 to \$2.45 (inclusive)
- \* the Final Price will be determined on the basis of the bids and objective of maximizing the proceeds from the Offer, the desire for an orderly secondary market in the Shares and the creation of an ownership base of long term shareholders
- \* the Final Price will therefore not necessarily be the highest price at which bids and indications of interest are submitted for Shares.
- \* There is no assurance that any Applicant or Institution will be allocated Shares.

## Appendix II

### The Estimation of Risk & Returns

The measurement of risk and return is fundamental to the discipline of Finance. Given uncertainties about future prices and returns, we can portray the share price of a firm in terms of a stochastic process. This way of describing the dynamic behaviour of share prices is consistent with a Black-Scholes (1973) characterisation of asset prices. Under this characterisation, the path of a stock price is assumed to behave in the following manner:

$$dS = \mu S dt + \sigma S dz(t) \quad (1)$$

where  $S$  is the share price,  $\mu dt$  represents the drift component,  $\mu$  is the share's annualised expected return.  $\sigma dz(t)$  is the stochastic component, where  $\sigma$  is the annualised standard deviation of the share's return, and  $z$  is a standard Brownian motion.

Typically, the share price return dynamics can be characterised as having two components, the expected return and volatility:

$$\frac{dS}{S} = \mu dt + \sigma dz(t) \quad (2)$$

Under the Black & Scholes characterisation, the volatility component is assumed to be proportional to  $\sqrt{dt}$  so that  $dz = \varepsilon \sqrt{dt}$  (which is normally distributed with a mean of zero and a standard deviation of  $\sqrt{dt}$ ), where  $\varepsilon$  is standard normal. Hence over small periods of time, the distribution of asset returns are normally distributed with a mean of  $\mu dt$  and a variance of  $\sigma^2 dt$ . Maynes & Rumsey (1993) state that if stocks do not trade <sup>1</sup>, problems arise in the estimation of expected returns and in the measurement of

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<sup>1</sup> It is implicitly assumed in most theoretical models that stocks trade continuously, which implies no delays or impediments to the flow of information. One consequence of this assumption is that the stock price reflects all available information in both the Fama (1970) and Malkiel (1992) sense of the definition of stock market efficiency. The definition of an efficient market is discussed by Campbell, Lo & MacKinlay (1997, pp 20-21), Section 1.5, and cite the following definition from Malkiel (1992):

*"A capital market is said to be efficient if it fully and correctly reflects*



abnormal returns<sup>2</sup>.

Most studies that have examined beta estimation techniques share a commonly adopted definition of infrequent trading, which implies that trading in the stock occurs at least once a day [see, for example, Scholes & Williams (1977), Dimson (1979), Cohen, Hawawini, Maier, Schwartz & Whitcomb (1983) and Fowler & Rorke (1983)]. These studies are concerned that the OLS estimate of the slope of the market model is biased downwards because the recorded closing prices of stock returns and the market index correspond to transactions which occurred earlier in the day. This downward bias in betas leads to an overestimate of abnormal returns when the market risk premium is positive, and has been suspected to be partially responsible for the poor long-term performance of IPOs post-listing. However in the Australian market, infrequent trading is significantly more severe than in the United States<sup>3</sup>.

### Tests of Beta Stability

In addition to the problem of trading frequency, Luoma, Martikainen, Perttunen & Pynnönen (1993, p 472) believe that OLS regression coefficients are affected by market inefficiencies as information may not “reach all investors simultaneously and immediately causing lags in price adjustment”. These authors attempt to measure the biases in ten

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*all relevant information in determining security prices. Formally, the market is said to be efficient with respect to some information set ... if security prices would be unaffected by revealing that information to all participants. Moreover, efficiency with respect to an information set implies that it is impossible to make economic profits by trading on the basis of [that information set].”*

This assumption is violated if there is infrequent trading and is more severe in international markets other than the United States.

<sup>2</sup> Maynes & Rumsey (1993, p 147).

<sup>3</sup> The infrequency of trading similar to that observed in Finland and Spain. For further details on the specific behaviour of beta and robustness in these markets refer to Berglund & Löfund (1989) and Luoma, Martikainen, Perttunen & Pynnönen (1993).

alternative beta estimates<sup>4</sup> when stocks are infrequently traded and markets are inefficient, using data from the Stockholm Stock Exchange. Their results are in stark contrast to an earlier Finnish study by Berglund, Liljeblom & Löfund (1989) which found that commonly adopted beta estimates which were adjusted for infrequent trading using daily data did not significantly outperform the market model. Instead, in analysing seven separate beta measures, Luoma, Martikainen, Perttunen & Pynnönen (1993) find that trade-to-trade market model betas with adjustment for heteroskedasticity and error correction betas estimated both with and without trade-to-trade assumptions, produce relatively stable beta estimates for thinner markets. Given this evidence, beta factors for individual firms in this dissertation are calculated on a trade-to-trade basis. This ensures that all daily price information is used in the determination of regression estimates and the approach is consistent with Maynes & Rumsey (1993).

Subsequent theoretical work by Lo & MacKinlay (1990) explores the impact of infrequent trading on the time series properties of asset returns. Non-trading patterns are modelled as randomly censored observations, and asset returns generated are accumulated until 'observed'. The apparent observed return is estimated as the sum of all of the previously censored returns in succession. This approach permits the authors to measure both the extent of cross-autocorrelation between security returns and serial dependency in the market portfolio.

Lo & MacKinlay reject the view that non-synchronous trading is a major cause of spurious correlation. However, this is not surprising as non-trading parameters were calibrated from non-trading probabilities suggested by daily CRSP data from 1962-1987. The question of whether these results apply in infrequent-trading situations as severe as that experienced in Australia and emerging countries remains largely unanswered. However, the prospect of some departure is implied in the following passage:

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<sup>4</sup> These include the following specifications: OLS market model; trade-to-trade market model; Cohen, Hawawini, Maier, Schwartz & Whitcomb (1983) lagged over 1-10 days; Vasicek (1973); Error Correction Model (ECM) which accounts for long-run deviations from return equilibria and the reaction of the return series with changes in the market portfolio; ECM with trade-to-trade and a 10 day lag distribution beta.

*“Our premise is that non trading is a symptom of institutional features such as lagged adjustments and non synchronously reported prices, and our empirical results show that this is of little practical relevance. But if non-synchronicity is purposeful and informationally motivated, then the subsequent serial dependence in asset returns may well be considered genuine, since it is the result of economic forces rather than mismanagement” (p 205).*

Because of the possibility that trading frequency may bias expected returns, attention is paid to the way in which stock and market returns in the dissertation are measured.

### Measurement of Stock and Market Returns

Stock and market returns are required to estimate betas. The proxy for the risk free rate is estimated from 90 day bank accepted bill rates (BABs) which have the empirical advantage that they are short-term, relatively liquid and have been quoted daily over the sample period. As treasury notes were only quoted weekly over a significant part of the sample period<sup>5</sup>, their use would be problematic when calculating trade-to-trade returns for a proxy for the risk free asset. In any case, it is noted from Figure A below that the series for 90 day BABs and 13 week treasury notes behave in a similar fashion.

The price of a bond,  $P$ , is defined as:

$$P_{b,t}(\tau) = \frac{1}{1 + y_t(\tau) * \frac{\tau}{365}} \quad (3)$$

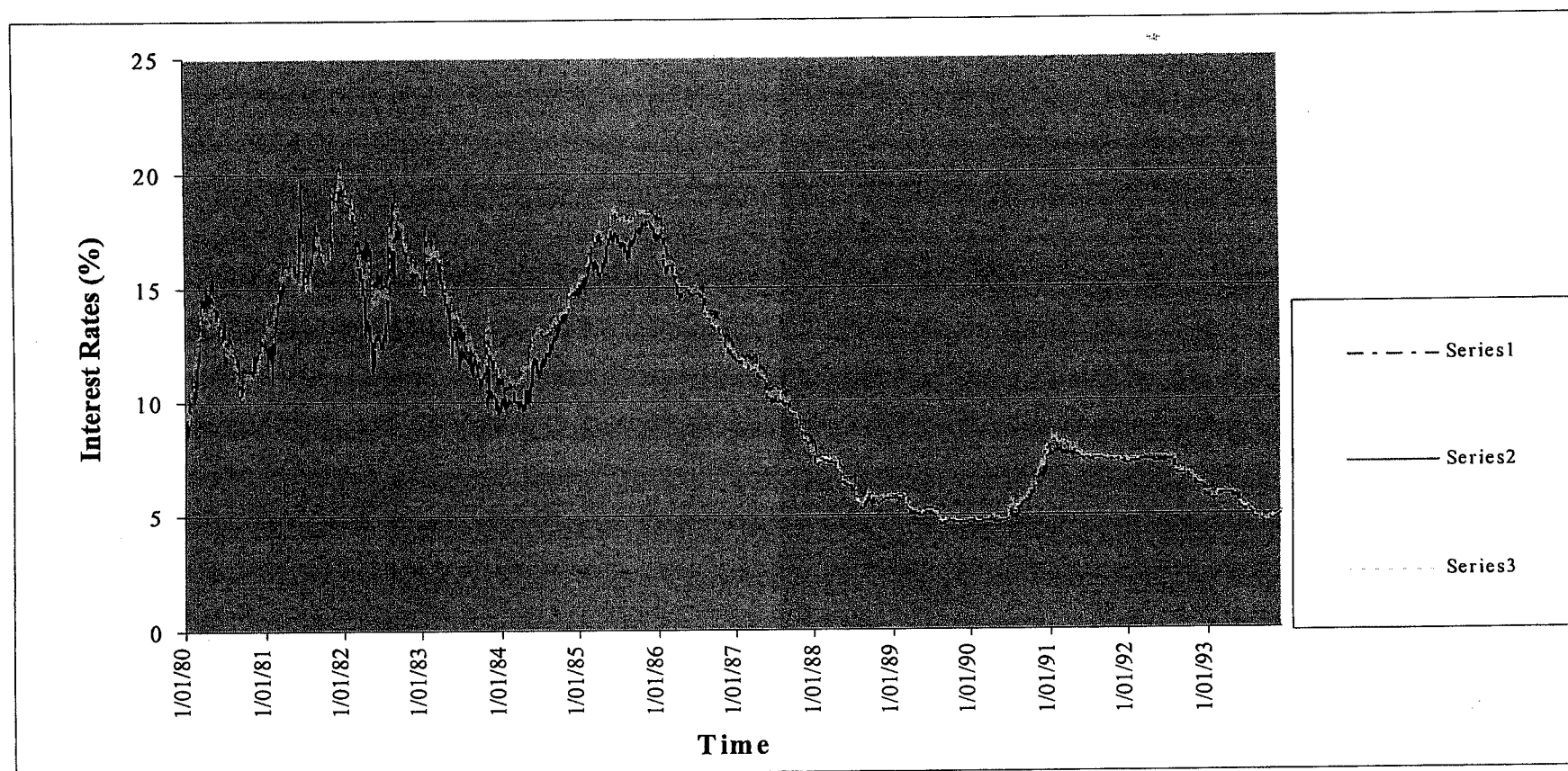
where  $P_{b,t}(\tau)$  is the price of a pure discount bond at time  $t$  with time to maturity,  $\tau$ , and  $y$  is the annualised yield on the bond. The return on the risk free asset is proxied by:

$$r_{b,t}(\Delta t) = \frac{P_{b,t+\Delta t} - P_{b,t}}{P_{b,t}} \quad (4)$$

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<sup>5</sup> Daily yields were not observed prior to 1985.

**Figure A - A Comparison of the Yields of 13 Week Treasury Notes and 30 versus 90 day Bank Accepted Bills (1980 - 1995)**



Source: Reserve Bank of Australia

where  $r_{b,t}$  is the realised return on a short-term bond (taken as 90 day BABs), measured over the time interval from  $t$  to  $t+\Delta t$ , and  $\Delta t$  is the period of time, expressed in years, between consecutive trades.

Correspondingly, the return on security  $j$ , measured on a trade to trade basis over an interval of time,  $\Delta t$ , is equal to:

$$r_{j,t}(\Delta t) = \frac{P_{j,t+\Delta t} - P_{j,t}}{P_{j,t}} \quad (5)$$

where  $r_{j,t}$  is the realised return on stock  $j$ , measured over time,  $t$ , to time,  $t+\Delta t$ . Furthermore, the return on the market proxy,  $m$ , over the exact same time interval as that of security  $j$ , is given by :

$$r_{m,t}(\Delta t) = \frac{I_{t+\Delta t} - I_t}{I_t} \quad (6)$$

where  $r_{m,t}$  is the corresponding realised return on the market index and  $I$  is an index of the overall performance of the stock market generally.

In calculating beta estimates for this study, it has been assumed that the returns follow the process as indicated above. The matching of security and market returns is undertaken on a trade to trade basis for one year and beta is the coefficient derived by maximum likelihood over the series, after adjusting for different trading intervals.

## Appendix III

### Description of the Primary Issues Database

#### I. COMPANY PARTICULARS

- indicates characteristics of issuing firms (including direct placements and IPOs) in the sample
- indicates status of data collection and extraction for management purposes.

<u>ITEM NUMBER</u>	<u>CODE</u>	<u>DESCRIPTION (type, width)</u>	<u>COMMENTS</u>
(1)	NO	Company Number (N4)	Serves as a unique identifier
(3)	COMPANY	Company Name (C50)	Full Name of Company
(4)	AASE	AASE Code (C3)	Stock Exchange 3 letter identifier (ticker symbol)
(6)	PROSPECTUS	Indicates whether the issue was an IPO or a direct placement	Indicates whether a prospectus (P) or information memorandum (IM)
(7)	LOCATION	Location - identifier (C1)	Indicates which investment bank provided the data. Used for data base management only.
(8)	ANALYSED	Identifies if prospectus data has been analysed (C1)	Used for data base management only.
(10)	TYPE	Indicates whether the firm was listed on the main or second board.	
(12)	ASX_NAME	Short Name. Company identifier on SB&F Statex Data Base (C12)	Links shares price & IPO data base
(14)	INDUS	Industry (C30)	Commonly used risk variable
(86)	ACTVTY	Activities as reported (C60)	Descriptive
(5)	REF	ASX-Research Reference (C6)	Reference to identify Statx and CRS publications for each company.
(11)	HAZI	Flag indicating whether the firm was included in the A&S Study (C1)	Secondary research function.
(15)	STX-INDUS	Industry as stated on database (N5)	Industry identifier
(72)	AGE	Age of the company. (N5) (not reliable)	Provides an indication of the level of experience in the firm
(80)	ASSOC-CO	Associated Company (Memo)	Provides an indication of endorsement by other reputable entities
(57)	FI	Founder (C20)	Descriptive
(58)	FI-PC	Percentage owned by the founders (N 5/2)	Leland & Pyle (1984) suggests that high levels of ownership is indicative of positive information asymmetries, the higher the ownership the more favourable the expected future outcome.

## IIA. PROSPECTUS INFORMATION

– indicates information publicly released in the prospectus for companies in the sample.

<u>ITEM NUMBER</u>	<u>CODE</u>	<u>DESCRIPTION (type, width)</u>	<u>COMMENTS</u>
(16)	DPROS	Date of Prospectus (D8)	Used to measure the subscription period
(19-29)	BROKI-II	Brokers to the issue (C3)	3-Alpha code used to identify broker(s)
(30-37)	UWI-UW8	Auditors (C20)	Balvers et. al (1988) (Reputation & Market Share Studies)
(39)	IA	Investigative Accountants (C20)	"
(40)	SOLICITORS	Solicitors (C20)	"
(41-43)	BANK 1-3	Bankers to the Firm (C20)	"
(44)	NSHS	Number of Fully Paid Ordinary Shares Issued in the IPO (N12)	Used to determine the amount of capital raised
(45)	NCTG	Number of Contributing Shares. Issued with the IPO (N12)	"
(46)	ISHS	Number of <u>Previously Issued</u> Fully Paid Ordinary Shares	Used to determine the dilutive effect of the new issue upon existing shareholders.
(47)	ICTG	Number of <u>Previously Issued</u> Contributing Shares (N12)	
(48)	PAR	Par Value of Ordinary Shares (N6)	Used to determine if the issue was at a premium or discount.
(49)	SUBP	Subscription Price - ordinary shares (N6)	"
(50)	PREM	Premium Paid (N6)	"
(51)	PCTG	Subscription Price - Contribution Shares (N6)	
(52)	NOPT	Number of Options issued in the IPO (N12)	Used to determine potential dilutive effect and subsequent equity raisings.
(53)	IPOT	Number of Options Previously Issued (N12)	"
(54)	POPT	Price of the Option Issued (N6)	Value of the Option
(55)	TVAL	Total Value of the Issue (N10)	Number of shares X subscription price
(60)	SUB-OPEN	Date Subscriptions Opened (D8)	Used to determine the period of subscription
(61)	SUB-CLOSE	Date Subscriptions Closed (D8)	Used to determine the period of subscription
(92)	POS	Period of Subscription (days) (N5)	Proxied by Dlist-sub-open
(93)	EQR	Total Equity Raised (N10)	

## **IIB. RESOURCE/MINING INFORMATION**

- Used to extend the information available for resource-based listings.

<b><u>ITEM NUMBER</u></b>	<b><u>CODE</u></b>	<b><u>DESCRIPTION (type, width)</u></b>	<b><u>COMMENTS</u></b>
(73)	MIN-TYPE	Explorer/Producer Dummy (C1)	Used to assess the risk of the resource-based company. Producers would be expected to yield cash flows from operations.
(79)	MINERALS	Minerals mined (C40)	Coded input indicating minerals mined. Used to link commodity risk factors to the issue



## IIC. COST STRUCTURE

- Indicates the cost of flotation related to the distribution of the issue.

<u>ITEM NUMBER</u>	<u>CODE</u>	<u>DESCRIPTION (type, width)</u>	<u>COMMENTS</u>
(62)	VUW	Variable Underwriting Rate (%)	
(63)	FUW	Fixed Underwriting Rate (\$)	
(64)	OUW	Options Issued in Lieu of Underwriting	
(65)	VSF	Variable Brokerage Rate (%)	
(66)	FSB	Fixed Brokerage Rate (\$)	
(67)	OSBQ	Options issued in lieu of brokerage	
(68)	COMMENTS	Comments other relevant details concerning fee structure, such as over allocation options and shares in lieu of professional fees (C50)	
(69A)	FORMEXP	Formation Expenditure (as disclosed). (N 12/6)	
(69B)	AUDIT	Auditor Name	
(69C)	IA	Investigating Accountant	
(69D)	UW	Underwriter	
(69E)	ADVICE	Advisory	
(69F)	LEGAL	Legal / Law Fees	
(69G)	TAX	Tax	
(69H)	MGT	Management Fees	
(69I)	VALNS	Valuations	
(69J)	EXPT	Expert Costs	
(69K)	ASC	Australian Securities Commission	
(69L)	ASX	Australian Stock Exchange Listing Fees	
(69M)	PRINT	Printing Costs	
(69N)	GEOL	Geologists Fees	
(69O)	OTHER	Other Costs not otherwise classified	
(69P)	TOTAL	Total Formation Costs	

### III. STATUS OF THE COMPANY

- Indicates changes to the Status company.

<u>ITEM NUMBER</u>	<u>CODE</u>	<u>DESCRIPTION (type, width)</u>	<u>COMMENTS</u>
(1)	COMPANY	Main Identifier (C50)	Linkage identifier
(2)	AASE	Main Identifier (C3)	"
(3)	OLD AASE	Original Code (C3)	
(4)	TYPE	Main/Second board identifier (C2)	
(5)	CH	Type of change (C4)	
(6)	CHANGE	Details of change (C50)	"
(7)	TF	Transfer from SB to MB flag (C1)	Change in Status identifier
(8)	DTF	Date of transfer (D8)	"
(9)	NEW AASE	New AASE code (C3)	"
(10)	NEW NAME	New Company name (C50)	"
(11)	NC	Name change flag (C50)	"
(12)	DNC	Date of name change (D8)	"
(13)	DELIST	Removal from ASX identifier (C1)	"
(14)	REASON	Reason for removal (C50)	"
(15)	DDELIST	Date of removal/Delisting (D8)	"
(16)	TAKEOVER	Takeover Identifier (C1)	"
(17)	BIDDER	Bidding firm [AASE] (C50)	"
(18)	DTAKEOVER	Date of takeover (D8)	"
(19)	OTHER	Other NEC (C10)	"
(20)	SUSPEND	Suspension identifier (C1)	"
(21)	DSUSPEND	Date of suspension	"
(22)	DCHANGE	Date of change	"
(23)	COMMENTS	Other information (C15)	Captures additional information not easily classified elsewhere.

#### IV. FINANCIAL INFORMATION/HISTORY

- Details financial history of the issuing firm.
- Allows user to specify growth rates in sales and profits.

<u>ITEM NUMBER</u>	<u>CODE</u>	<u>DESCRIPTION (type, width)</u>	<u>COMMENTS</u>
(89)	SALES	First reported Sales (\$M) (N 12/6)	Potential Firm Size Variable Used to calculate growth rates
(90)	SALES-2	Last Reported Sales (N 12/6)	"
(83)	PROFIT	First Reported Profit (N 12/6)	"
(84)	PROFIT 2	Last Reported Profit (\$M)(N 12/6)	"
(70)	FIRST-YR	Year of Early-Sale/Profit (C2)	Able to analyse period between listing and disclosure
(71)	NO_YRS	Period of Sales - M/Profit 2 (N2)	Used to calculate growth rates in sales and profits
(74)	TA	Total Assets (N 12/6)	Measure of Firm Size
(75)	CA	Total Current Assets (N 12/6)	Component for debt-equity ratio. Note Shareholders' Funds = Total Assets - Total Liabilities
(78)	INTAN	Total Intangible Assets (N 12/6)	
(76)	TL	Total Liabilities (N 12/6)	
(77)	CL	Total Current Liabilities (N 12/6)	
(91)	GSALES	Growth in Sales Over the Period (N 11/6)	Used for growth rates
(85)	GPROFIT	Growth in Profit over the period (N 11/6)	"
(82)	SOURCE	Source of Financial Data (C3)	Captures data source

## V. POST-LISTING INFORMATION

<u>ITEM NUMBER</u>	<u>CODE</u>	<u>DESCRIPTION (type, width)</u>	<u>COMMENTS</u>
(17)	DLIST	Date of Listing (D8)	Linkage code for Share Price Integration
(87)	TOP20	Percentage held by Top 20 at listing (N 6/2)	Indicative of Ownership Concentration
	DAY 1-11.WK3	Relate to separate files which hold high, low, last share price & volume on day x.	Used to estimate level of underpricing over a 2 week period (sample will be extended - currently limited by space & memory of PC).
	WEEK 1-50, WK3	Relate to separate files which hold high, low, last share prices & volume on week x.	Used to estimate underpricing levels of 1 year and ex-post confirmation of beta estimates adjusted for thin trading.
(18)	DLISTC	Date of Listing (C8)	Character field makes exporting to VAX easier.
(88)	TOP5	Percentage held by Top 5 at listing (N 6/2)	Indicative of ownership concentration
(89)	INSTOWN	Percentage of the top 20 held by identifiable institutional owners (N 6/2)	Indicative of the level of institutional support
(100)	UPG	Underpricing: simple percentage rate of return (N 6/4)	Calculated by: $\frac{FP\ USED - SUBP}{FP\ USED}$
(97)	FPRICE	First Available Share Price on Statex (N 6/2)	Source : ASX Share Price Information
(98)	FP	First Price Entered manually from various sources (N 6/2)	Source: Australian Financial Review or other Media
(99)	FP-USED	Consolidated figures from FPRICE and FP. (N 6/2)	Merged information from (97) or (98) missing from (97).

## VI. SURVIVAL INFORMATION

<u>ITEM NUMBER</u>	<u>CODE</u>	<u>DESCRIPTION (type, width)</u>	<u>COMMENTS</u>
(94)	F_NF	Failed - Non failed identifier as at 30.6.93 (N2) -1 = survived +1 = failed 2 = takeover	Distinguishes between remaining and delisted firms
	DAYSFAIL	Number of days listed to 31.6.95 or removal date	
	DAYSTO	Number of days listed to takeover else zero.	

(app2-desc of primary equity offers database.wpd)

## Appendix IV

### Inflation Rates - Australia Consumer Price Index (All Groups)

The Consumer Price Index (CPI) is recorded each June (1989/90=Base 100) and applied to the nominal value of all listings in the common calendar year. To establish a framework for valuing issues in constant dollars, the June figures are used to establish the percentage change in the CPI for each year. A deflator index has been created with a notional value of 1.0000 as at June 1997. By dividing each nominal value by the deflator yields the equivalent constant 1997 dollar value.

Year	CPI (June)	% Change Jun-Jun	Deflator for 1997 Dollars
1983	62.9	11.13074	0.5233
1984	65.4	3.97456	0.5441
1985	69.7	6.57492	0.5799
1986	75.6	8.46485	0.6290
1987	82.6	9.25926	0.6872
1988	88.5	7.14286	0.7363
1989	95.2	7.57062	0.7920
1990	102.5	7.66807	0.8527
1991	106.0	3.41463	0.8819
1992	107.3	1.22642	0.8927
1993	109.3	1.86393	0.9093
1994	111.2	1.73833	0.9251
1995	116.2	4.49640	0.9667
1996	119.8	3.09811	0.9967
1997	120.2	0.33389	1.0000

Source: Reserve Bank Bulletin, December 1996, 1998, Table G2.

## Appendix V

### Withdrawn Issues by Year (1994-1997)

This table indicates the number of withdrawn issues as reported in Connect 4 from 1994 to 1997. Data detailing withdrawals was not readily available prior to 1994, although antidotally there were a number of withdrawals subsequent to the October 1987 stock market crash.

Year	Number of Issues
1994	20
1995	4
1996	6
1997	10
1998	Not Available

Source: Connect 4 Company Prospectus Database

### Withdrawn Issues by Company Name (1994-1997)

This table indicates the company names of firm that withdrew their offering by year.

Year	Companies Withdrawn
1994	Australian Gold Mines NL Blackwattle Gold Limited Consolidated Investments Australasia Limited Dreamworld Limited Eureka Gold Mines NL Gold State NL HighPoint International Index Trusts Industrial Minerals Australia Limited New Century Films Limited NRMA Holdings Limited Permacrest Limited Petbarn Group Limited Pirie Pooled Development Limited Premier Pacific Pharmaceutical Industries Limited Progen Industries Limited Sara River Gold NL Sun Capital Limited Tanami Gold NL Transkal Gold NL Universal Food Holdings Limited
1995	Asian Energy Limited Breaksea Petroleum NL Pharmaceutical Halh Products Limited Transcan Limited
1996	Alliance Sovereign Debt Fund Asian Mining NL Mahajaya Asia Pacific Limited Minyango Resources Limited Regent Eastern Europe Fund Limited Sammeta Resources NL
1997	Biologic International Limited EcoMist International Limited Galileo Hotel Group Hudson Minerals Limited Itela Communications Corporation Limited Joy Long Holdings Limited North Rand NL Thunderbolt Resources NL Tulloch Resources NL
1998-1999	Information - Not Available

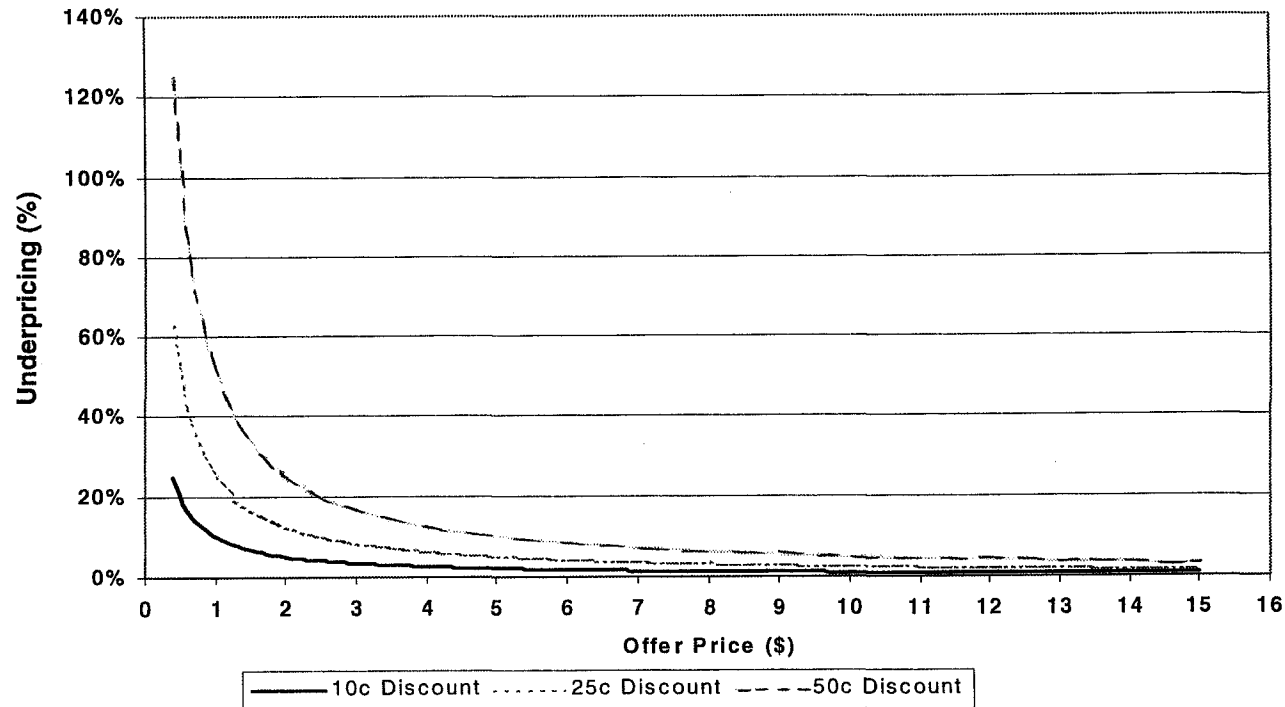
Source: Connect 4 Company Prospectus Database



## Appendix VI

### The Effect of a 10c, 25c and 50c Discount on Underpricing as a Function of Offer Prices Ranging Between 50c and \$15.

Based on this diagram one can see that for very low offer prices, particularly less than \$1, there is a sharp increase in the level of underpricing. The inclusion of issues with offer prices less than \$1 will increase the average level of underpricing reported across the entire sample. Researchers therefore must consider the benefits of larger sample sizes against the possibility that underpricing is distorted.



Source: Simulation

## Appendix VII - Ranking of Australian Audit Firms

This table details the name and rank of the top 20 audit practices for the years 1988-1995. In addition to the Top 20, this ranking also examines firms with major international affiliates (denoted as "other" ) and takes into consideration size variables such as the number of partners, employees, offices and fee income on an annual basis as a measure of activity. The Big 6/8 column indicates those firms who were ranked at any time during the period in the Top 6/8.

Accounting Practices	1995	1994	1993	1992	1991	1990	1989	1988	Big6/8	Top 20
Alliotts Australia	Other	Other								
Arthur Andersen	1	1	3	5	5	5	5	4	1	1
Arthur Young								5	1	1
BDO Binder		Other	Other	Other					0	1
BDO Nelson Parkhill	8	8	10	9	10	10			0	1
Bentleys	17	16	17	17	17	14	15	15	0	1
Berg White	Other	Other	Other	Other	Other	Other	Other		0	1
Bird Cameron	10	7	8	10	9	7	8	9	0	1
Bourne Griffiths					20	17	16	16	0	1
Clark Kenneth Leventhal		Other	Other						0	1
Coopers & Lybrand	3	4	2	2	3	3	3	2	1	1
Deloitte Touche Tohmatsu	6	6	6	6	6	6	6		1	1
Deloitte Haskins & Sells								8	1	1
DFK Australia	Other								0	1
DRM International		Other	Other						0	1
Duesburys			7	7	7	8	11	12	0	1
Ernst & Young	2	3	5	3	2	2	1		1	1
Ernst & Whinney								6	1	1
Fellers Australasia	Other								0	1
Ferrier Hodgson	11	9	9	8	8	11	14		0	1
GMN Australia	Other	Other							0	1
Grant Thornton	12	15	Other						0	1
Greenwood Challoner						Other	20	20	0	1
Haines Norton	Other	Other	20	Other	Other	20	Other		0	1
Hall Chadwick	16	12	13	13	13				0	1
Hall Wilson						13	13	14	0	1
HLB International		Other	Other						0	1
Horwarth & Horwath	7	11	12	12	12	12	12	13	0	1
IA Australia	Other								0	1
Jeffreys Henry Intn'l	Other								0	1
KPMG	4	2	1	1	1	1			1	1
Kendalls							Other		0	1
Krestons Australia	Other								0	1
Macquarie Partners	Other	Other							0	1
Mann Judd	14	14	15	15	16	16	17	17	0	1
Moore Stephens	15	18							0	1
Moore Rowland Intn'l		Other	Other						0	1
Nelson Parkhill BDO							10	10	0	1
Nexia International			Other						0	1
Pannell Kerr Forster	9	10	11	11	11	9	9	11	0	1
Peat Marwick Hungerfords							2	1	1	1
Pitcher Partners	18	19	19	20					0	1
Prentice Parbery Barilla	Other	Other	Other	Other					0	1
Priestley & Morris				Other	19	19	18	18	0	1
Price Waterhouse	5	5	4	4	4	4	4	3	1	1
Sothertons	Other		Other	Other	Other	Other	Other		0	1
Summit - Australia	13	13	16	16	15				0	1
Summit Int'l Assocs Inc		Other	Other						0	1
TAG		Other							0	1
TGI (Court & Co)	20	17	18	18	18	18			0	1
Touche Ross							7	7	1	1
Thompson Douglass			14	14	14	15	19	19	0	1
Urbach Hacker Young			Other						0	1
Walker Wayland	Other	Other	Other	Other	Other	Other	Other		0	1
William Buck Group	19	20							0	1

Source: Chartac Accountancy News

**Appendix VIII**  
**Variables Used in the Analysis (Chapters 4-5)**

THEME	VARIABLE	DEFINITION	Chapter 4	Chapter 5
<b>CORPORATE GOVERNANCE</b>	RETENT	Original Founders' Holding in the New Listing	✓	✓
<b>TRANSACTION COSTS</b>	LNSIZE	Log of Issue Size	✓	✓
	SQDLN	Squared Log of Issue Size	✓	✓
<b>INFORMATION ASYMMETRY</b>  KEY: (a) Firm Quality (b) Firm Reputation (c) Firm Risk (d) Liquidity	NTAPS <sup>(a)</sup>	Net Tangible Assets Per Share	✓	✓
	INDUS <sup>(a)</sup>	Industrial = 0, Resource based = 1	✓	✓
	AUDIT <sup>(a)</sup>	Non-Big 6/8 = 0, Big 6/8 = 1	✓	✓
	GROWTH <sup>(a)</sup>	Ratio of Market to Book Value of Equity -the market value is determined using last price on the first trading day	✓	✓
	UPG <sup>(a)(c)</sup>	Level of Underpricing as per eqn 2.3	✓	✓
	LEVERAGE <sup>(a)(c)</sup>	Ratio of Debt to Equity as indicated in the Balance sheet at the time of listing	✓	✓
	RETAIL	Indicator variable, Non-Big 4 retail bank = 0, Big 4 retail bank = 1	✓	
	AGE <sup>(b)</sup>	Stated age or Period from Date of Incorporation to Date of Listing	✓	✓
	PROFIT <sup>(b)</sup>	Non profitable = 0, Profitable = 1	✓	✓
	BETA <sup>(c)</sup>	Maximum Likelihood using trade to trade returns	✓	✓
	SD30 <sup>(c)</sup>	Standard deviation of the first 30 days returns	✓	✓
<b>DISTRIBUTION CHANNEL STRUCTURE</b>	CONCUR	The number of concurrent issues occurring in the month of listing and for 2 months before listing	✓	✓
	MKTRET	Return on the All Ordinaries Accumulation Index over 1, 3 months prior to listing	✓	✓
<b>CONTROL</b>	REGUL	Indicator Variable, pre 1991=0, post 1990 = 1	✓	
	KNOWHOW	Indicator Variable	✓	
<b>UNDERWRITER CONTROL VARIABLES</b>	UW	Indicator variable - not underwritten = 0, underwritten = 1		✓
	REPUT	Aggregate value of issues underwritten. Where 2+ underwriters exist, it was assumed that the responsibilities for the issue are equally shared.		✓

**Appendix IX Summary Descriptive Statistics**  
**Panel I: Underwritten Issues (n=699 issues)**

Variable (Proxy)	Initial Public Offerings (n=631)		Direct Placements (n=68)		Differences Between Sample Means (t-Statistic)
	Mean	Std Deviation	Mean	Std Deviation	
Total Assets (\$97M)*	191.5471	3492.6988	73.8433	321.7557	0.8150
Issue Size \$M 1997 *	24.353	92.5798	27.693	78.331	-0.3278
Founding Shareholders' Retention ( <i>RETENT</i> )	42.2184	25.0278	46.3698	31.0732	-1.0651
Net Tangible Assets Per Share ( <i>NTAPS</i> )	86.2616	229.8849	163.5979	355.009	-1.7571
Industry (industrial vs mining) ( <i>INDUS</i> )	0.3534	0.4784	0.1912	0.3962	3.1384***
Quality of Accounting Procedures ( <i>AUDIT</i> )	0.7195	0.4496	0.7353	0.4445	-0.2782
Market / Book Value of Equity ( <i>GROWTH</i> )	1.549	2.1319	0.8996	1.3824	3.4561***
Expected Level of Underpricing % ( <i>UPG</i> )	0.234	0.7902	0.3945	0.8131	-1.5507
Firm Age ( <i>AGE</i> )	6.3326	12.9671	5.5175	13.6517	0.4700
Firm Profitability ( <i>PROFIT</i> )	0.4580	0.4986	0.5735	0.4982	-1.8162*
Firm Risk - Leverage ( <i>LEVERAGE</i> )	0.8539	2.1218	0.7941	1.6967	0.2689
Firm Risk - Beta ( <i>BETA</i> )	0.6281	0.7276	0.5789	0.8071	0.4820
Firm Risk - Std. Devn. first 30 day returns ( <i>SD30</i> )	0.0449	0.031	0.0506	0.0445	-1.0297
Number of Concurrent Issues ( <i>CONCUR</i> )	67.916	44.6161	93.6029	40.0917	-4.9626***
Market performance % ( <i>MKTRET</i> )	0.0109	0.1673	0.0183	0.187	-0.3131
Reputation of the Underwriter ( <i>REPUT</i> )	0.3662	0.5561	0.4706	0.6101	-1.3519
Number of Underwriters in Syndicate ( <i>NOUWS</i> )	1.3502	0.6919	1.2206	0.5139	1.9021*
Issue Costs \$M ( <i>ISSUEC</i> )*	0.8363	1.6918	0.5687	1.7786	1.0538
Issue Cost Per Dollar Raised % ( <i>CPDR</i> )**	0.0598	0.0547	0.0521	0.1136	0.5521
Duration of the issue period to trading ( <i>DURAT</i> ) ***	50.2791	51.1173	38.8333	54.3077	0.8807

**KEY:** \* reported in real 1997 dollars. \* n<sub>IPO</sub> = 596, n<sub>DP</sub> = 53, \*\* n<sub>IPO</sub> = 631, n<sub>DP</sub> = 68, \*\*\* n<sub>IPO</sub> = 516, n<sub>DP</sub> = 18.

Source: Dissertation Database.

**Appendix IX Summary Descriptive Statistics**  
**Panel II: Non-underwritten Issues (n=138 issues)**

Variable (Proxy)	Initial Public Offerings (n=48)		Direct Placements (n=90)		Differences Between Sample Means (t-Statistic)
	Mean	Std Deviation	Mean	Std Deviation	
Total Assets (\$97M)*	119.4745	351.1303	29.095	90.537	1.7525*
Issue Size \$M 1997 *	47.4152	178.000	12.224	36.764	1.3544
Founding Shareholders' Retention ( <i>RETENT</i> )	39.7508	34.029	47.1161	33.8584	-1.2131
Net Tangible Assets Per Share ( <i>NTAPS</i> )	100.5959	136.1817	136.0148	235.56	-1.1184
Industry (industrial vs mining) ( <i>INDUS</i> )	0.1875	0.3944	0.1778	0.3845	0.1388
Quality of Accounting Procedures ( <i>AUDIT</i> )	0.5208	0.5049	0.6	0.4926	-0.8851
Market / Book Value of Equity ( <i>GROWTH</i> )	1.6007	2.4322	1.0699	1.7068	1.3456
Expected Level of Underpricing % ( <i>UPG</i> )	0.4806	1.162	0.7649	1.4915	-1.2367
Firm Age ( <i>AGE</i> )	7.9893	17.2604	5.3278	9.0959	0.9970
Firm Profitability ( <i>PROFIT</i> )	0.4167	0.4982	0.4444	0.4997	-0.3108
Firm Risk - Leverage ( <i>LEVERAGE</i> )	1.3428	3.3567	0.6096	1.4696	1.4414
Firm Risk - Beta ( <i>BETA</i> )	0.2192	1.0942	0.3835	0.9276	-0.8845
Firm Risk - Std. Devn. first 30 day returns ( <i>SD30</i> )	0.0409	0.0335	0.0471	0.0336	-1.0344
Number of Concurrent Issues ( <i>CONCUR</i> )	52.8542	40.2122	75.8778	41.0135	-3.1813***
Market performance % ( <i>MKTRET</i> )	0.0278	0.1926	0.0056	0.1423	0.7028
Issue Costs \$M ( <i>ISSUEC</i> )*	0.3266	0.5838	0.1107	0.1405	2.3283**
Issue Cost Per Dollar Raised % ( <i>CPDR</i> )**	0.0523	0.0629	0.0489	0.1205	0.2178
Duration of the issue period to trading ( <i>DURAT</i> ) ***	54.65	51.5382	75.8333	142.5165	-0.3606

**KEY:** \* reported in real 1997 dollars. + n<sub>IPD</sub> = 41, n<sub>DP</sub> = 69, \*\* n<sub>IPD</sub> = 48, n<sub>DP</sub> = 90, \*\*\* n<sub>IPD</sub> = 40, n<sub>DP</sub> = 6.

Source: Dissertation Database.

**Appendix IX Summary Descriptive Statistics**  
**Panel III: Small Issues (below the median issue size) (n=421 issues)**

Variable (Proxy)	Initial Public Offerings (n=320)		Direct Placements (n=101)		Differences Between Sample Means (t-Statistic)
	Mean	Std Deviation	Mean	Std Deviation	
Total Assets (\$97M)*	7.5561	21.5307	11.9926	20.5897	-1.8671*
Issue Size \$M 1997 *	2.976	1.358	2.1775	1.4645	4.8597***
Founding Shareholders' Retention ( <i>RETENT</i> )	46.3839	23.3092	56.3790	31.0970	-2.9770***
Net Tangible Assets Per Share ( <i>NTAPS</i> )	64.9558	228.0026	134.2346	244.1468	-2.5253**
Industry (industrial vs mining) ( <i>INDUS</i> )	0.4594	0.4991	0.1881	0.3928	5.6495***
Quality of Accounting Procedures ( <i>AUDIT</i> )	0.6281	0.4841	0.5941	0.4935	0.6064
Market / Book Value of Equity ( <i>GROWTH</i> )	1.6590	2.3160	0.8919	1.5375	3.8275***
Expected Level of Underpricing % ( <i>UPG</i> )	0.3431	0.9482	0.71596	1.2843	-2.6951***
Firm Age ( <i>AGE</i> )	3.9594	7.6069	4.9604	8.0740	-1.1012
Firm Profitability ( <i>PROFIT</i> )	0.3125	0.4642	0.4455	0.4995	-2.3721**
Firm Risk - Leverage ( <i>LEVERAGE</i> )	0.7363	1.9326	0.6204	1.3628	0.6685
Firm Risk - Beta ( <i>BETA</i> )	0.6127	0.9397	0.4020	0.9023	2.0256**
Firm Risk - Std. Devn. first 30 day returns ( <i>SD30</i> )	0.0548	0.0339	0.0514	0.0408	0.7589
Number of Concurrent Issues ( <i>CONCUR</i> )	70.8344	42.5900	82.7822	41.2458	-2.5181**
Market performance % ( <i>MKTRET</i> )	0.0184	0.1762	0.0005	0.1352	1.0736
Underwriter Indicator Variable ( <i>UW</i> )	0.91	0.29	0.30	0.46	12.5623***
Reputation of the Underwriter ( <i>REPUT</i> )	0.1563	0.3805	0.0990	0.3002	1.5626
Number of Underwriters in Syndicate ( <i>NOUWS</i> )	1.1125	0.5977	0.3663	0.6438	10.3280***
Issue Costs \$M ( <i>ISSUEC</i> )*	0.2227	0.2597	0.1217	0.1493	4.5303***
Issue Cost Per Dollar Raised % ( <i>CPDR</i> )**	0.0724	0.0655	0.0679	0.1430	0.3063
Duration of the issue period to trading ( <i>DURAT</i> ) ***	61.9360	57.2417	46.0714	92.8651	0.6325

KEY: \* reported in real 1997 dollars. \* n<sub>IPO</sub> =304, n<sub>DP</sub> = 81, \*\* n<sub>IPO</sub> =320, n<sub>DP</sub> = 101, \*\*\* n<sub>IPO</sub> =250, n<sub>DP</sub> = 14.  
Source: Dissertation Database.

## Appendix IX Summary Descriptive Statistics

### Panel IV: Large Issues (above the median issue size) (n=416 issues)

Variable (Proxy)	Initial Public Offerings (n=359)		Direct Placements (n=57)		Differences Between Sample Means (T-Statistic)
	Mean	Std Deviation	Mean	Std Deviation	
Total Assets (\$97M)*	345.9137	4629.2259	112.7830	361.8120	0.9364
Issue Size \$M 1997 *	46490767	135659383	48479483	90861373.12	-0.1420
Founding Shareholders' Retention ( <i>RETENT</i> )	38.1755	27.1868	29.8126	28.1334	2.0944**
Net Tangible Assets Per Share ( <i>NTAPS</i> )	107.1695	219.7616	172.0754	363.4927	-1.3106
Industry (industrial vs mining) ( <i>INDUS</i> )	0.2368	0.4257	0.1754	0.3837	1.1050
Quality of Accounting Procedures ( <i>AUDIT</i> )	0.7744	0.4186	0.7719	0.4233	0.0415
Market / Book Value of Equity ( <i>GROWTH</i> )	1.4579	1.9941	1.1821	1.6310	1.1477
Expected Level of Underpricing % ( <i>UPG</i> )	0.1698	0.6844	0.4098	1.1896	-1.4847
Firm Age ( <i>AGE</i> )	8.6695	16.5321	6.2050	15.3972	1.1110
Firm Profitability ( <i>PROFIT</i> )	0.5822	0.4939	0.5965	0.4950	-0.2027
Firm Risk - Leverage ( <i>LEVERAGE</i> )	1.0242	2.4627	0.8106	1.8868	0.7583
Firm Risk - Beta ( <i>BETA</i> )	0.5872	0.5681	0.5838	0.8353	0.0297
Firm Risk - Std. Devn. first 30 day returns ( <i>SD30</i> )	0.0360	0.0256	0.0436	0.0341	-1.6121
Number of Concurrent Issues ( <i>CONCUR</i> )	63.3008	45.8305	84.7895	42.1099	-3.5346***
Market performance % ( <i>MKTRET</i> )	0.0657	0.1625	0.0299	0.2024	1.2719
Underwriter Indicator Variable ( <i>UW</i> )	0.95	0.22	0.67	0.48	4.3324***
Reputation of the Underwriter ( <i>REPUT</i> )	0.5044	0.6120	0.3860	0.6197	1.3423
Number of Underwriters in Syndicate ( <i>NOUWS</i> )	1.3816	0.8468	0.8070	0.6928	5.6296***
Issue Costs \$M ( <i>ISSUEC</i> )	1.3336	2.1327	0.6810	2.0114	1.9471
Issue Cost Per Dollar Raised % ( <i>CPDR</i> )	0.0475	0.0408	0.0191	0.0225	7.7242***
Duration of the issue period to trading ( <i>DURAT</i> )	41.3268	43.4446	50.9000	71.1859	-0.4227

KEY: \* reported in real 1997 dollars. \* n<sub>IPO</sub> = 333, n<sub>DP</sub> = 41, \*\* n<sub>IPO</sub> = 359, n<sub>DP</sub> = 57, \*\*\* n<sub>IPO</sub> = 306, n<sub>DP</sub> = 10.

Source: Dissertation Database.

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