Pricing of Initial Public Offerings in Malaysia: 2001-2011

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STATEMENT OF ORIGINALITY

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Khairul Anuar Vasudavan Abdullah

We deceive ourselves by the smallness of our surrenders.

Derek Kidner

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TABLE OF CONTENTS

STATEMENT OF ORIGINALITY ..... (ii)
ACKNOWLEDGMENTS ..... (iv)
TABLE OF CONTENTS ..... (v)
LIST OF TABLES ..... (viii)
LIST OF FIGURES ..... (ix)
ABSTRACT ..... (x)

CHAPTER 1: INTRODUCTION **1**
1.1 Background 1
1.2 Peculiarities of the Malaysian Stock Market 2
1.3 Problem Statement 5
1.4 Research Objectives 6
1.5 Research Questions 8
1.6 Conceptual Framework 8
1.7 Definitions 12
1.8 Hypotheses 17
1.9 Potential Contribution of the Research 28
1.10 Organisation of the Remaining Chapters 29

CHAPTER 2: LITERATURE REVIEW **31**
2.1 Introduction 31
2.2 Theories of Underpricing 33
2.2.1 Information Asymmetry Theories 33
2.2.1.1 Winner's Curse Model 33
2.2.1.2 Signalling Model 38
2.2.1.3 Principal-Agent Model 46
2.2.1.4 Investment Bank's Monopsony Power Model 50
2.2.1.5 Certification Model 51

2.2.2 Institutional Theories ……..…..…….....…… 54
2.2.2.1 Litigation Avoidance Model ……..……..…… 54
2.2.2.2 Tax Advantages Model ……....…… 58
2.2.3 Ownership and Control Theories ……..…...…… 58
2.2.3.1 Ownership Model ……..……...…… 58
2.2.3.2 Agency Cost Reduction Model ……..……...…… 60
2.2.3.3 Liquidity Model ……..……..…… 61
2.2.4 Behavioural Models …….....…… 62
2.2.4.1 Information Cascades Model …….…… 63
2.2.4.2 Investor Sentiment Model …….…….…… 64
2.2.4.3 Prospect Theory …….…….…… 65
2.3 Summary ……..…… 66

CHAPTER 3: RESEARCH METHODOLOGY ……....…… 67
3.1 Introduction ……..…….……..…… 67
3.2 Research Design and Objectives …….……...…..…… 67
3.3 Data Sources and Data Collection ……..……..…… 68
3.4 Sample Selection …..…….…….....…...……..…… 69
3.5 Sample Size …..…….……..…...……..…… 72
3.6 Operational Definitions ..……...……..……...……..…… 72
3.6.1 Dependent Variable …..…….…….....…...……..…… 72
3.6.2 Independent Variables ……...…..……...……..…… 73
3.7 Analysis of Data ……...…..…….……..…..…… 81
3.8 Limitations of the Research …...…….....……..…… 82

CHAPTER 4: RESULTS AND DISCUSSION …… 83
4.1 Introduction …….……..…….……..…… 83
4.2 Descriptive Statistics ..…….....……..…… 83
4.3 Hypotheses Testing and Results …...……..…….……....…… 97
4.4 Conclusion …….…….....…….……..…… 108

CHAPTER 5: DISCUSSION AND CONCLUSIONS …….....…… 111

5.1 Introduction …….……..…….……..…… 111

5.2 Summary of Research Results ..……..……..……..…… 111

5.3 Evaluation of the Conceptual Framework ……...……...…..…… 117

5.4 Implications of the Results …...…….……..…… 118

5.5 Limitations of the Research ..……..…….……...…..…… 120

5.6 Recommendation for Research Opportunities ..……...…… 121

5.7 Conclusions ……...…….……..…… 121

REFERENCES ……...……....…… 123

LIST OF TABLES

Table 3.1	Break-down of the Sample Based on Industry Sectors ……....…	75
Table 3.2	Break-down of Sample Based on Investment Bank Categories ….	79
Table 4.1	Mean Underpricing by Period and Year ……....……	84
Table 4.2	Descriptive Statistics of the Independent Variables (*N*=130) ….....	84
Table 4.3	Summary of the Hypotheses Testing Results ……..……...	109

LIST OF FIGURES

Figure 1.1	Conceptual Framework: The Determinants of Underpricing …….	10
Figure 4.1	Histogram of Underpricing for the Study Period 2001 to 2011 (*N*=130) ……...	85
Figure 4.2	Yearly Number of IPOs (2001 to 2011) and the Mean Underpricing in the Respective Years ……	85
Figure 4.3	Bar Chart of the Bumiputera Firms and Non-Bumiputera Firms (*N*=130) ……...……	86
Figure 4.4	Bar Chart of the Age Categories of the Sample (*N*=130) ……...…	87
Figure 4.5	Bar Chart of the Size Categories of the Sample (*N*=130) ……...…	88
Figure 4.6	Bar Chart of the Industry Categories of the Sample (*N*=130) ….....	88
Figure 4.7	Bar Chart of the Placement Share Categories of the Sample (*N*=130) ……...…	89
Figure 4.8	Bar Chart of the Gross Proceeds Categories of the Sample (*N*=130) ……...	90
Figure 4.9	Bar Chart of the Listed Firm/Entrepreneur Shareholder Categories of the Sample (*N*=130) …….	91
Figure 4.10	Bar Chart of the Secondary Share Categories of the Sample (*N*=130) ……..…….	92
Figure 4.11	Bar Chart of the Offer Price Categories of the Sample (*N*=130) …	92
Figure 4.12	Bar Chart of the Investment Bank Categories of the Sample (*N*=130) ……...…	93
Figure 4.13	Bar Chart of the Auditor Categories of the Sample (*N*=130) ….....	94
Figure 4.14	Bar Chart of the Retained Shareholding Categories of the Sample (*N*=130) ……...……	95
Figure 4.15	Bar Chart of the Subscription Rate Categories of the Sample (*N*=130) ……...	96
Figure 4.16	Bar Chart of the KLCI Categories of the Sample (*N*=130) .....…...	97

ABSTRACT

The objective of this research is to (i) investigate the level of underpricing of IPOs on the Main Market of Bursa Malaysia between 2001 and 2011, and to identify the trend of underpricing, if any, and (ii) to identify the factors which are related to underpricing. The research identified 15 variables which may be related to underpricing, namely Bumiputera firm, age, size, industry, placement share, gross proceeds, listed firm/entrepreneur shareholder, secondary share, offer price, investment bank reputation, auditor reputation, retained shareholding, subscription rate and stock market performance. 16 hypotheses were developed and tested using descriptive statistics and Spearman rho correlation test. This research found mean underpricing of 12.15% for the period 2001-2011. On a year-to-year basis, the mean underpricing was the highest in 2003 at 27.35%. The IPOs were overpriced in 2001 and 2008 where the mean underpricing was 5.97% and 8.95% respectively for the two years. There was no obvious trend in underpricing during the study period. This research found a positive correlation between underpricing, and placement share and subscription rate, and a negative correlation between underpricing, and secondary share and stock market performance. The subscription rate variable is a consequence of the investment decision made by the investors and only becomes known after the closing of the IPO. The stock market performance on the other hand is an external factor. Hence, only two of the variables related to the firm are correlated to underpricing. One possible explanation for the results is the role played by the regulatory authorities, specifically the Securities Commission, in approving the IPO firms for listing. Investors may have perceived the role of regulatory authorities as certifiers of the quality of the firm and once an IPO firm is approved for listing, the quality of the firm is assured. Therefore investors may be observing external factors such as the stock market performance for investment decisions. It is recommended that investment banks study the process through which investors make their IPO investment decisions and determine the information which they use to make their investment decisions. It is also recommended that the Securities Commission study the effect of firms reserving high proportion of IPO shares for placement relative to the shares reserved for retail investors, and the effect of lowering the maximum percentage of shareholdings which can be held by

major shareholders from the current 75%. One of the possible areas for future research is to explore the other external factors connected to the capital market and performance of the economy which may be related to underpricing such as interest rates, exchange rates and economic growth. Another possible area for research is the relationship between underpricing and qualitative information on the IPO firm, such as quality of directors and management, research and development activities, risk factors which affect the businesses, reliance on exports, and expansion overseas.

CHAPTER 1

INTRODUCTION

1.1 Background

Shareholders of private firms at certain point along their journey will decide whether to remain private or become public. To become a public firm, the firm will have to offer its shares to public investors, a process referred to as initial public offering (IPO). The decision to go public is one of the areas widely researched in corporate finance and no single theory can capture all the relevant costs and benefits (Pagano et al., 1998).

Once the decision to go public is made, the issue price at which the shares of the firm are offered to its potential investors must be determined by the pre-IPO shareholders of the firm, the investment bank advising the firm on the IPO exercise, and its underwriters.

Upon listing, if the subsequent trading price of the shares is higher than the issue price, the issue price is said to be underpriced. Rajan and Servaes (1997) and Varshney and Robinson (2004) list three well-documented anomalies associated with IPO: underpricing, hot issue market and long-run underperformance.

Financial data since 1970s shows that it is common to observe the IPO offer price to be lower than the price the capital market assigns to a firm's shares on the first day of trading (Carter and Manaster, 1990; Certo et al., 2001; Rock, 1986).

Loughran and Ritter's (2004) study of 6,391 IPOs in the United States between 1980 and 2003 found that in the 1980s, the average first day returns were slightly over 7%. This increased to 15% in the 1990s, and jumped to 65% during the internet bubble years of 1999-2000. In the post-bubble period of 2000-2003, the average first day returns were approximately 12%. Loughran et al.'s (2013) data for 49 countries show average initial returns of between 4.2% (in Russia for 1999-2006) to 264.5% (in Saudi Arabia

for 2003-2010). The average first day returns for mature capital markets such as United States and United Kingdom are 16.8% (for 1960-2012) and 16.1% (for 1959-2012) respectively, while Malaysia, Singapore and Thailand, emerging markets in South East Asia, recorded average first days returns of 62.6% (for 1980-2009), 26.1% (for 1973-2011) and 36.6% (for 1987-2007) respectively.

This implies that the capital market is willing to assign a higher value on the shares compared to the offer price to sell the shares. Ibbotson (1975) found that IPOs are underpriced by an average of 11.4% discount over the opening price for the period between 1960 to 1969, while Ibbotson and Jaffe (1975) found an average of 16.8% excess return over the offer price for the period 1960 to 1970. Ibbotson (1975) called the phenomenon as a "mystery". This phenomenon is referred to as underpricing.

1.2 Peculiarities of the Malaysian Stock Market

In Malaysia, two government agencies regulate the stock market, namely the Securities Commission and Bursa Malaysia Securities Berhad.

Prasad et al. (2006) identifies two distinct characteristics in the Malaysian stock market which may not be observed in the other markets, namely the Bumiputera equity ownership policies and the regulatory control of pricing. In addition, the Malaysian stock market has another characteristic, which is the involvement of statutory bodies as investors in firms. These characteristics are discussed respectively below.

1.2.1 Bumiputera Equity Ownership Policies

In 1970, the Malaysian Government announced the New Economic Policy (NEP) with the objectives of eradicating poverty irrespective of race, and to restructure the society by removing the identification of race with functions in the context of economic growth (Woon, 1989). The NEP expired in 1990 and it was replaced with the National Development Policy (NDP).

Both the NEP and NDP's objectives were to enhance and intensify the participation of the Bumiputera (indigenous Malays being the local indigenous people) in the economy. One of the main objectives of the NEP is to increase the Bumiputera equity ownership which stood at 2.4% in 1970 to 30% by 1990.

As part of the NEP and NDP, in order to increase the Bumiputera equity ownership in the corporate sector, the regulations stipulated that at least 30% of the shares of the firms embarking on an IPO exercise (that is at the pre-IPO stage) must be held by either the Bumiputera individuals or Bumiputera owned institutions. This rule however does not apply to Bumiputera controlled IPO firms. (Bumiputera controlled firms are defined by the Securities Commission as either (a) 51 % of the firm's equities are owned by Bumiputera shareholders; or (b) at least 35% of firm's equity are owned by Bumiputera shareholders and managers of the firm. In addition, at least 50% of the board of directors must be Bumiputera. Where the IPO firms do not have any or sufficient Bumiputera shareholders at the point of application of listing, the Ministry of International Trade and Industry will then nominate Bumiputera individuals or organisation for the allocation of the 30% shares.

The aforesaid share ownership policy is to be completed prior to the IPO exercise. Upon closure of the application period, the applicants will be sorted based on (i) number of shares applied for; and (ii) whether the applicants are Bumiputera or non-Bumiputera. Once the applications are closed, the IPO shares will be allotted to investors through two rounds of balloting. At the first round, only the Bumiputera investors are balloted where 30% of the total shares will be allotted to Bumiputera investors. The unsuccessful Bumiputera applications are then added back to the balance of the applications which will then be balloted for the second time. The second round of balloting gives applicants from all races (including the Bumiputera applicants) equal chance for allocation of the IPO shares. However, the two rounds of balloting increases the probability of being allotted the IPO shares to Bumiputera investors, and consequently the shares allocated to Bumiputera investors will be above the minimum 30% required under the policy.

The classification of the IPO firms into Bumiputera firms and non-Bumiputera firms can be explained through the "market microstructure" theory where the set-up of the financial market favours one group of investors (Prasad et al., 2006). The market microstructure is also observed in other markets, such as the issuance of two classes of shares to domestic investors and foreign investors in China (Chen et al., 2000), bank and non-bank classification in Mexico (Hensler et al., 2000), the long time period between closing of the IPO and actual listing, and the unofficial premium market before the opening of the IPOs in India (Nandha and Sawyer, 2002).

1.2.2 Regulatory Approvals of Listings and Pricing

There are at least four regulatory authorities involved in the approving the IPOs in Malaysia, namely the Securities Commission, Bursa Malaysia, the Ministry of International Trade and Industry, and the Foreign Investment Committee. The Securities Commission plays a major role in approving the IPOs. Prior to submitting the applications for a listing to the authorities, a firm intending to seek listing will appoint its advisors, principally an investment bank, and other advisors such as auditors and legal advisers to assess whether the firm is qualified for a listing based on quantitative and qualitative criteria set by the Securities Commission. Even though the advisers are satisfied that the firm is qualified for a listing and submits the applications to the Securities Commission, the Securities Commission may reject the application based on qualitative factors such as corporate governance issues, future prospects, insufficient working capital, absence of core business and conflict-of-interest between the parties involved in the firm's business. When the investment bank and underwriters assess a firm as qualified for a listing, they are also prepared to take the financial risk arising from undersubscription, and the approval requirement of the Securities Commission can be taken as hindrance to the market from operating efficiently. Hence, once a firm is approved for IPO, the approval can be viewed as being certification of its quality by the Securities Commission.

In addition to the above, as part of its applications for listing, the firm will submit the indicative price of the IPO as determined by the IPO firm and its investment bank to the

Securities Commission for approval. The firm will be required to justify the indicative price which is generally based on a number of factors including the firms net asset value, prospective price/earnings multiples and its future prospects. On approving the IPO, the Securities Commission may also revise the IPO issue price. The final IPO issue price is always determined by the IPO firm and its investment bank with the consent of the Securities Commission. Save for large issues which involves placement to institutions, and several IPOs which involve book-building exercise locally and abroad, the pricing of the majority of the IPOs do not involve feedback from potential investors.

1.2.3 Involvement of Statutory Bodies as Investors

As part of the efforts to increase the Bumiputera equity ownerships, the Government has set-up a number of trust funds which play a major role in the Malaysian equity market. Each of the state governments also has similar investment arms. One of the major players in the Malaysian equity market is Permodalan Nasional Berhad, Malaysia's biggest fund management company. The profits of these investment agencies are distributed by way of dividends to Bumiputera unit holders.

The trust funds and investment agencies hold investments in the IPO firm as a shareholder, and will insist that controls and corporate governance are put in place to safeguard their investment. These investment entities effectively play the role of certifiers on the quality of the IPO firms to other investors.

1.3 Problem Statement

The equity market plays an important role in ensuring that continuous and unconstrained flow of equity financing is available freely to firms. The equity market provides financing through the IPO and through the secondary market. Equity financing complements the other financing options available to firms. The ability to raise new capital efficiently through the IPO or the secondary market will encourage

entrepreneurship and economic growth (Jenkinson and Ljungqvist, 2001). An efficient market will boost the confidence in the capital market and draw more investments into the economy.

Studies on IPOs continue to flourish as there are aspects relating to IPOs which need further research. Each capital market has its own peculiarities arising either due to legacy issues, regulations or behaviour of the players in the market. While researchers have formulated a number of theories to explain the underpricing phenomenon, the relevance and applicability of the theories are dependent on the capital market being studied, the nature of relationship between the market players as well as the period of study (Ritter, 2003).

Since an IPO is a step firms undertake into the equity market, a study on how the equity market functions and specifically how the IPO market operates will provide insights on the factors which influence its health and drives its growth. As the participation of the investors is vital for the survival of the equity market, it is also necessary to study the factors which attract investors to invest in certain firms while other firms fail to draw their attention.

This research investigates the factors which are related to the perceived valuation of the IPO firms in Malaysia by studying the variables which are related to underpricing after taking into account the peculiarities of the Malaysian capital market, namely the Bumiputera equity ownership policies, regulatory approval requirements and pricing, and the participation of statutory bodies as shareholders. Specifically, this research investigates the factors which are related to the performance of the IPOs on the first day of trading.

1.4 Research Objectives

Literature on the pricing of IPOs suggests that underpricing is consistent across capital markets around the world with different financial market maturity, corporate structures,

regulatory control, level of corporate governance, firm characteristics, taxation policy, and local economic and cultural characteristics (Ritter, 1984; Loughran et al., 1994).

The Malaysian capital market has been evolving in tandem with other mature markets. Regulatory changes have been made to protect investors while the market has been liberalised to allow innovative financial product developments mirroring established capital markets. The performance of the Malaysian economy is dependent and influenced by the performance of other developed economies. Accordingly, any theoretical explanations provided should be equally applicable in any capital market including that of Malaysia.

A number of variables have been identified as influencers of underpricing, such as the age of the firm (Muscarella and Vetsuypens, 1989; Ritter, 1998; Loughran and Ritter, 2004), size of the firm (Carter et al., 1998; Ibbotson et al., 1988; Ibbotson et al., 1994; Megginson and Weiss, 1991), offer price (Daily et al (2003), reputation of the firm's investment bank (Beatty and Ritter, 1986; Carter et al., 1998; Carter and Manaster, 1990; Logue, 1973), reputation of auditors (Beatty, 1989; Feltham et al., 1991; Marshall, 2004; Michaely and Shaw, 1994), percentage of shares retained by the pre-IPO shareholders (Habib and Ljungqvist, 2001; Leland and Pyle, 1977; Grinblatt and Hwang, 1989) , IPO proceeds (Carter et al., 1998; Tinic, 1988) and performance of the stock market (Ibbtoson and Jaffe, 1975; McGuinness, 1992; Dimovski and Brooks, 2004).

While the Malaysian capital market has been evolving in tandem with other developed capital markets, it also operates under a number of peculiarities such as the preferential allocation of shares to Bumiputera investors where the set-up of the financial market favours one group of investors, requirement of regulatory approval of IPOs, and involvement of state owned trust funds and investment agencies as equity investors. This research explores underpricing of IPOs on the Main Market of Bursa Malaysia, Malaysia's stock exchange for the period from 2001 to 2011. Specifically, this research explores the various underpricing theories and develops a conceptual framework to explain underpricing in Malaysia and to determine the variables which are related to

underpricing in Malaysia, after taking into consideration the peculiarities of the Malaysian capital market.

The objective of this research is to investigate the factors which influence the equity investors' valuation of IPO firms. The difference between the offer price and first day closing is the additional value which investors ascribe to the IPO firms. The factors are represented by the independent variables which may be related to underpricing.

1.5 Research Questions

Research questions are constructed to meet the research's objectives. The two research questions below will serve as a guide towards the construction of the hypotheses and methodology of the research. The two research questions are as follows:

RQ1: Is there evidence of underpricing of IPOs in Malaysia between 2001 and 2011? If there is evidence of underpricing, did the underpricing level increase or decrease during the research period 2001 and 2011?

RQ2: Which of the following variables, that is, Bumiputera firm, age, size, industry, placement share, gross proceeds, listed firm/entrepreneur shareholder, secondary share, offer price, investment bank reputation, auditor reputation, retained shareholding, subscription rate and stock market performance, are related to underpricing?

1.6 Conceptual Framework

Ljungqvist (2007) categorised the theories on underpricing into four main headings, namely asymmetric information, ownership and control, behavioural, and institutional. The institutional theory is not investigated in this research due to insufficient information to test the models under the theory. In addition, this research also investigates the market microstructure theory.

The information asymmetry theory posits that the insiders of the IPO firm possess more information compared to the potential investors. The theory is investigated in this research through three models, namely the winner's curse model, the signalling model and the certification model.

The winner's curse model assumes that investors can be categorised into two groups, informed investors who will only invest in IPOs which are priced attractively, and uninformed investors who will invest indiscriminately. This creates a "winner's curse" situation for the uninformed investors as they will be partly crowded out in attractive IPOs while in unattractive IPOs they will receive all the shares they apply for. Asymmetric information leads to uncertainty on a firm's value and as asymmetric information increases ex-*ante* uncertainty, it also consequently amplifies underpricing (Gunther and Rummer, 2006). To reduce the ex-*ante* certainty and underpricing, certain positive information on the firm can be released to potential investors such as the age and size of the firm and industry prospects. This research has used age, size, industry, placement share and secondary share to test the winner's curse model.

One way to resolve problems related to asymmetric information is through signals (Akerlof, 1970; Spence, 1973). When an IPO firm has high quality information about its value compared to investors, it can use underpricing to signal the firm's true high quality (Ljungqvist, 2007). Ibbotson (1975) who first proposed signalling in IPOs research suggests that firms underprice to "leave a good taste in investors' mouths". This research has used gross proceeds, listed firm/ entrepreneur shareholder, and offer price to test the signalling model.

One of the focuses of research on credible signals in the IPOs process is third party certification (Carter and Manaster, 1990; Cohen and Dean, 2005; Megginson and Weiss, 1991). Researchers suggest that information asymmetry between pre-IPO shareholders and potential investors can be mitigated through certification on the quality of the IPO firm by independent third parties such the investment banks and underwriters (the terms are used here interchangeably, although the two are distinctive and the latter is a subset of the former), and auditors (Baron, 1982; Booth and Smith, 1986; Myers and Majluf, 1984; Titman and Trueman, 1986). Certification by third-parties such as investment

banks, underwriters and auditors whose reputation, legitimacy and prestige lends credence to the quality of the IPO firm, act as signal to reduce information asymmetry on an IPO firm (Booth and Smith, 1986; Carter and Manaster, 1990; Cohen and Dean, 2005; Megginson and Weiss, 1991; Titman and Trueman, 1986). This research has used investment bank reputation and auditor reputation to test the certification model.

Researchers have developed hypothesis that the shareholding structure of a firm can be used as a signal to indicate quality of the IPO firm to explain underpricing (Leland and Pyle, 1977; Grinblatt and Hwang, 1989). The proportion of equity interest held by the pre-IPO shareholders in the firm after the IPO signals the potential projected cash flows and the higher the proportion of equity held, the higher the projected cash flows and consequently underpricing (Leland and Pyle, 1977). This research has used the retained shareholding variable to test the ownership model.

One of the reasons for firms to go public is to increase the liquidity of the IPO firms' shares. Booth and Chua (1996) argue firms underprice their IPO shares to increase liquidity by increasing the number of investors. Booth and Chua (1996) argue that promoting oversubscription allows broad initial ownership dispersion, which in turn achieves a liquid secondary market for the shares. Hence, the purpose of underpricing according to Booth and Chua (1996) is to draw the attention of potential investors and draw them to participate in the IPO. This research has used the IPO subscription rate variable to test the liquidity model.

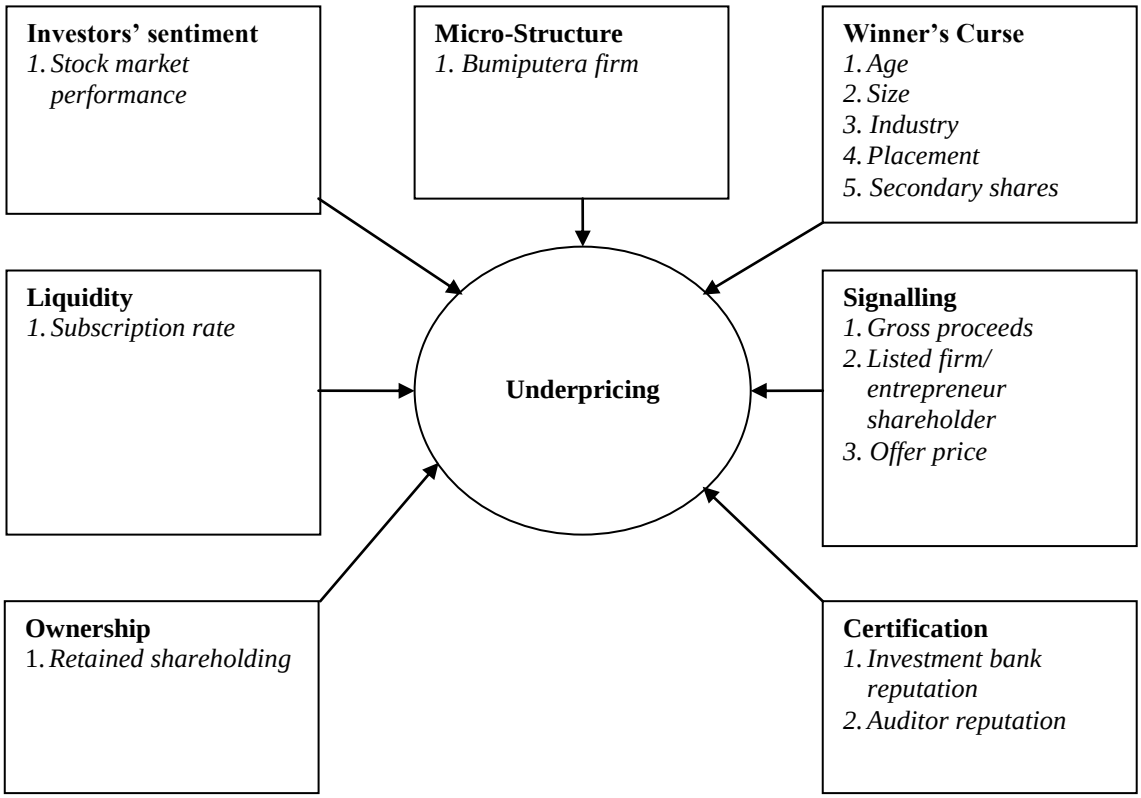
The behavioural theory is investigated in this research through the investors' sentiment model. Researchers have found a positive relationship between underpricing and stock market performance (Ibbotson and Jaffe, 1975; Ritter, 1984; McGuinness, 1992; Suchard and Woo, 2003; Dimovski and Brooks, 2004). Information on IPO firms are generally scarce to outsiders rendering the task of valuing the firm difficult (Ljungqvist, 2007). When the stock market is on the rise, the demand for shares from outsiders would increase as more and new investors would be interested in the shares. This research has used the stock market performance variable to test the investors' sentiment model.

This research also investigates the classification of IPO firms into Bumiputera and non-Bumiputera firms and the effect on underpricing. The classification can be explained through the "market microstructure" theory where the set-up of the financial market favours one group of investors (Prasad et al., 2006). The market microstructure is also observed in other markets, such as the issuance of two classes of shares to domestic investors and foreign investors in China (Chen et al., 2000), bank and non-bank classification in Mexico (Hensler et al., 2000), the long time period between closing of the IPO and actual listing, and the unofficial premium market before the opening of the IPOs in India (Nandha and Sawyer, 2002).

Based on the four theories and the seven models discussed above, a conceptual framework has been developed for this research. The seven models are chosen based on their applicability in the Malaysian context and availability of reliable data for investigation. The framework offers a model to provide a logical explanation on the relationships between several factors and underpricing.

The conceptual framework is depicted in Figure 1.1

Figure 1.1
Conceptual Framework: The Determinants of Underpricing



The seven models stated above are discussed in detail in Chapter 2.

1.7 Definitions

The following definitions shall apply throughout this Dissertation unless the definitions are defined otherwise or the context requires otherwise:

Age of firm	:	The age of the firm is determined based on the date of incorporation of the principal operating company as disclosed in the prospectus to the date of the prospectus. The age of the firm is measured in years. Ages in months are expressed in fractions of years. Hence, a firm aged six years and three months is expressed as 6.25 years.

Auditor reputation	:	The auditor reputation is based on whether the auditor of the IPO firm is one of the Big Four group comprising Deloitte & Touche, Ernst & Young, KPMG and PricewaterhouseCoopers. The Securities Commission's Audit Oversight Board 2010 Annual Report states that the Big Four together with two others firms with more than 10 partners collectively audited 73% of the public entities in Malaysia and their listed clients accounted for 93% of the total market capitalisation of the companies on Bursa Malaysia. Arthur Andersen Malaysia, which was in the Big Six group earlier, and merged with Ernst & Young is included in the Big Four group in this research.
Bursa Malaysia	:	Bursa Malaysia Securities Berhad, the Malaysian stock exchange.
Bumiputera	:	A Sanskrit word which translated literally means "son of earth". It includes the Malays as well as the indigenous ethnic groups such as the Orang Asli in the Peninsular Malaysia and the tribal people in Sabah and Sarawak.
Bumiputera firm	:	A firm is categorised as a Bumiputera firm when the Bumiputera shareholdings in the firm is above 51%, as defined by the Securities Commission.
Closing price	:	The price at which the last transaction of the shares of the IPO firm is concluded on the first day of trading of the shares.

Gross proceeds	:	The gross proceeds are the cash proceeds raised by the firm from the offering of shares to investors. It is computed by multiplying the number of IPO shares offered to investors against the offer price.
IPO	:	Initial Public Offering. It refers to the offering of shares by a firm to the public for the first time as part of its listing exercise on a stock exchange. Subsequent offering of shares to the public by the listed firm is referred to as secondary offering.
Industry	:	The firms in the sample are categorised into eight sectors based on the principal business activity in which they are involved in. The sectors are based on Bursa Malaysia's categorisation of listed firms on the Main Market based on their principal business activity.
Investment bank	:	The institution which advises the IPO firm on its application to the authorities for the listing on Bursa Malaysia. The Securities Commission Act (1993) stipulates that all submissions to the Securities Commission must be submitted through an investment bank. The Securities Commission's Equity Guidelines also requires the principal investment bank to participate in the underwriting of the shares issued to the public.
Investment bank reputation	:	The investment bank reputation is based on the relative market share of each of the investment bank during the research period. The relative market share is determined by totalling the number of IPOs an investment bank is involved in as an

		advisor and then dividing the figure by the total IPOs during the research period (Megginson and Weiss, 1991; Ritter, 2003).
KLCI	:	FTSE Bursa Malaysia Kuala Lumpur Composite Index, the index tracking the performance of 30 largest capitalised companies on Bursa Malaysia, calculated accordingly to FTSE's globally accepted index standards.
Listed firm/entrepreneur shareholder	:	The shareholder(s) of an IPO firm comprising (i) firm(s) which is/are already listed on Bursa Malaysia, and/or, (ii) an entrepreneur or entrepreneurs who is/are shareholder(s) of another listed firm on Bursa Malaysia. This information is extracted from the list of shareholders of the IPO firm and the profile of the shareholders disclosed in the prospectus.
Main Market	:	One of the two boards of trading in Bursa Malaysia. The other board is the ACE Market. On 3 August 2009 what was then referred to as Main Board of Bursa Malaysia was renamed the Main Market. The Second Board of the Bursa Malaysia was abolished on the same day and all firms listed on the Second Board were transferred to the Main Board.
Offer price	:	The price at which the IPO shares are offered to investors.
Overpriced	:	The shares are overpriced when the closing price is lower than the offer price.

Placement share	:	Placement shares are the IPO shares which are allocated to certain identified investors. The allocation is not subject to balloting unlike the shares offered to retail investors.
Pre-IPO firm	:	The firm prior to undertaking the IPO exercise.
Pre-IPO shareholders	:	Shareholders of the pre-IPO firm, as disclosed in the prospectus.
Prospectus	:	The document issued to the investors detailing information on the IPO firm including its business, directors, management, future prospects, risk factors and financial results. The information disclosure is governed by the "Prospectus Guideline – Securities and Debt" issued by the Securities Commission. The prospectus must be approved by the Securities Commission prior to issuance to the public.
Retained shareholding	:	The shareholdings held by the pre-IPO shareholders after the IPO.
Secondary shares	:	The shares held by the pre-IPO shareholder(s) and offered to investors as part of the IPO.
Security	:	The investment instrument issued by a firm to investors as evidence of equity in the firm or to creditors as evidence of debt.
Securities Commission	:	Securities Commission Malaysia.

Size of firm	:	The size of the firm is based on the audited consolidated total assets of the firm prior to the listing. It is extracted from the prospectus.
Statutory body	:	Comprises a government owned investment agency or trust fund which is listed as a pre-IPO shareholder.
Subscription rate	:	The rate at which the IPO shares offered to investors is subscribed. It is expressed as a multiple.
Underpricing	:	This research adopts the measure of underpricing generally used in studies on underpricing (Habib and Ljungqvist, 1998; Rosa et al., 2003):

$$UP = \frac{(P_c - P_i)}{P_i}$$

where, P_c represents the closing price on the first day of trading and P_i is the offer price of the IPO firm *i*.

1.8 Hypotheses

The hypotheses (H) below have been derived in order to answer the RQs.

1.8.1 Evidence of Underpricing

RQ1: Is there evidence of underpricing of IPOs in Malaysia between 2001 and 2011? If there is evidence of underpricing, did the underpricing level increase or decrease over time during the study period 2001 and 2011?

Research on the pricing of IPOs suggests that underpricing is consistent across capital markets around the world (Ritter, 1984; Loughran et al., 1994). Loughran and Ritter (2004) found that in the 1980s, the average first day returns were slightly over 7%, which increased to 15% in the 1990s, and jumped to 65% during the internet bubble years of 1999-2000. In the post-bubble period of 2000-2003, the average first day returns were approximately 12%. Loughran et al.'s (2013) data for 49 countries shows average initial returns of between 4.2% (in Russia for 1999-2006) to 264.5% (in Saudi Arabia for 2003-2010).

H1a: IPOs during the research period 2001 and 2011 were underpriced.

Asymmetric information model suggest that underpricing is used to address the information gap between the firm insiders and the potential investors. With the development of the Malaysian capital market, the Securities Commission and Bursa Malaysia have over time required disclosure of more information and transparency in reporting to potential investors. The increased information disclosure and transparency in reporting will reduce the investment risk arising from uncertainty and also the investor's perceived risk, and therefore the valuation uncertainty which contributes to underpricing. Michaely and Shaw (1994) and Schrand and Verrecchia (2005) found underpricing decrease with firm initiated information disclosure. Hence, with the information gap becoming narrower, the underpricing level should be lower.

H1b: The level of underpricing is in a decreasing trend over the research period 2001 and 2011.

1.8.2 Variables which are Related to Underpricing

RQ2: Which of the following variables, that is, Bumiputera firm, age, size, industry, placement share, gross proceeds, listed firm/entrepreneur shareholder, secondary share, offer price, investment bank reputation, auditor reputation, retained shareholding, subscription rate and stock market performance, are related to underpricing?

1.8.2.1 Micro-Structure Theory

H2 relating to whether the IPO firm is controlled by Bumiputera or not is based on the microstructure model.

(i) Bumiputera firm

The classification of the IPO firms into Bumiputera firms and non-Bumiputera firms can be explained through the "market microstructure" theory where the set-up of the financial market favours one group of investors (Prasad et al., 2006). Prasad et al. (2006) found that in the short run, IPOs after the implementation of the NEP policy (1976-1992) are more underpriced compared to the IPO before the NEP policy (1968-1975). However, Hiau Abdullah and Mohd (2004) suggest that government regulatory intervention promoting Bumiputera participation in the Malaysian equity market results in reduced underpricing.

However, the information disclosure requirements imposed on the IPO firms will be the same regardless of whether they are Bumiputera firms or not. Hence, the level of underpricing should not be different between the Bumiputera firm and non-Bumiputera firms.

> *H2: Underpricing is not related to whether the firm is a Bumiputera firm or non-Bumiputera firm.*

1.8.2.2 Winner's Curse Model

H3, H4, H5 and H6 relating to the age of the firm, size of the firm, industry in which the IPO firm operates and whether the IPO entails share placement, are based on the winner's curse model.

(i) Age

Researchers have used age of the firm as a proxy for risk – firms which have longer history are considered less risky (Carter et al., 1998; Ritter, 1998). Cassia et al. (2004) hypothesized that the uncertainty and information asymmetry associated with older and larger firms are less and hence lower the underpricing. Older firms also outperform younger ones both before and after IPO (Ritter, 1998). The longer the firm has been in business the lower the uncertainty relating to its viability as well as its experience in running the business. Management of older firms would have gone through the learning curve and will be able to withstand any commercial challenges it might face from time to time. Megginson and Weiss (1991), Muscarella and Vetsuypens (1989), Ritter (1998), and Loughran and Ritter (2004) found that the longer the firm has been in business the lower the underpricing.

H3: Underpricing is negatively related to the age of the firm.

(ii) Size

Researchers found shares of larger IPO firms outperform smaller firms in terms of value market price appreciation (Megginson and Weiss, 1991). Cassia et al. (2004) hypothesized that the uncertainty and information asymmetry associated with larger and older firms are less and hence the lower the underpricing. The larger the size of the firm, the greater will be its ability to access resources to remain viable and profitable. Researchers have found a negative relationship between firm size and underpricing (Carter et al., 1998; Ibbotson et al., 1988; Ibbotson et al., 1994; Megginson and Weiss,

1991). Yong (2007) found the firms listed on the Second Board and Mesdaq market for the period 1999 to December 2003 recorded higher underpricing compared to IPOs on the main market.

H4: Underpricing is negatively related to the size of the IPO firm.

(iii) Industry

IPO firms involved in the growth industries will have better prospects and earnings growth potential compared to firms in mature industries. Investors will give higher valuation to firms in the growth industries and therefore will experience higher underpricing. On the other hand, firms which are involved in industries which are high risk, will be given lower valuations. Hence, underpricing of firms which are involved in the riskier industries will be higher compared to firms which are involved in the low risk businesses. Loughran and Ritter (2004) and Suchard and Woo (2003) found that IPO firms in high-risk and fast changing environment are more underpriced compared to firms in industries which are strictly regulated such as financial services. The profile of the IPO firms in the sample of this research show that the firms do not fall into the high risk and high growth potential categories.

H5: Underpricing is not related to the industry of the IPO firm.

(iv) Placement share

When an IPO firm proposes a placement exercise, prior to the issuance of the prospectus, the investment bank will market the IPO's share offer. Through the marketing exercise the investment bank would obtain sufficient feedback on the optimum level of pricing from investors to clear the IPO shares. Hanley (1993) contends that the investment bank will partially adjust the final offer price based on the information collected from the investors. Yong (2011) found IPOs which entails

placement recorded lower underpricing compared to IPOs which does not entail placement.

H6: Underpricing is positively related to the proportion of the placement share.

1.8.2.3 Signalling Model

H7, H8, H9 and H10 relating to the gross proceeds, listed firm/entrepreneur shareholder, secondary share and offer price are based on the signalling model.

(i) Gross proceeds

Gross proceeds of an IPO is determined through the multiplication of the number of IPO shares offered and the offer price. Firms which raise higher gross proceeds are generally large established firms which would be perceived less risky for investment (Carter et al., 1998). Tinic (1988) on the other hand argues that small issues are offered by small firms which are speculative in nature while larger offerings are associated with seasoned large firms.

H7: Underpricing is negatively related to the IPO gross proceeds.

(ii) Listed firm/entrepreneur shareholder

Baron (1982) suggests that information asymmetries and uncertainty would be reduced where the holding firm of the IPO firm is already listed. If the shareholder(s) of an IPO firm is/are (i) firm(s) which is/are already listed on Bursa Malaysia, and/or, (ii) an entrepreneur or entrepreneurs who is/are shareholder(s) of another listed firm on Bursa Malaysia, it will give confidence to the potential investors that the new IPO firm will also be successful. This is based on the assumption that some of the business strategies

as well as governance and controls will be replicated in the new IPO firm, and accordingly less underpricing is required.

H8: Underpricing negatively related to the Listed Firm/Entrepreneur Shareholder

(iii) Secondary share

Secondary share sale entails sale of shares already held by the pre-IPO shareholders to the investing public. In the Malaysian context, it is referred to as offer for sale. Habib and Ljungqvist (2001) and Ljungqvist and Wilhelm (2003) suggests that pre-IPO shareholders will experience higher losses as a result of their offer for sale resulting from dilution compared to retaining their shares. As a result primary offering (offering of new shares) is likely to be more severely underpriced compared to secondary share offerings. Carter and Manaster (1990) and Brennan and Franks (1997) found a negative relationship between underpricing of IPOs and sale of secondary shares. Yong et al. (2001) found the underpricing for IPOs which entails entirely of secondary shares recorded the highest underpricing at 93.34%, IPOs which entails only primary offering recorded underpricing of 87.28% while IPOs which entails a combination new shares and secondary shares recorded the lowest underpricing of 63.67%,

H9: Underpricing is negatively related to proportion of secondary shares on sale.

(iv) Offer price

Brennan and Hughes (1991) suggests that a high risk IPO firms can signal quality by setting the IPO price low while Beatty and Welch (1996) suggests IPO firms can signal quality by setting the IPO price low to attract attention from investors. Ibbotson et al. (1988) found that firms which set their IPO price unusually low (eg. less than $3) record high levels of underpricing. Daily et al. (2003) suggests that lower price signals that the

firm's prospects are significantly uncertain. Hence, IPO firms which set the offer price low require less underpricing.

H10: Underpricing is negatively related to the offer price.

1.8.2.4 Certification Model

H11 and H12 relating to the investment bank and auditor reputation are based on the certification model.

(i) Investment bank reputation

The reputation of investment banks can be explained through two competing models: the principal-agent model and certification model. Loughran and Ritter (2002) contend that the main cause of underpricing is attributed to the agency problem while Ljungqvist and Wilhelm (2003) argue that the greater the asymmetry information between the IPO firm and the underwriter, the higher the value of the underwriter's role in the IPO as a certifier.

Investment banks can play the role of certifying the offer price as being consistent with the inside information on the future earnings potential of the firm (Booth and Smith, 1986). IPOs managed by high reputation investment banks benefit from superior certification (Carter et el., 1998; Carter and Manaster, 1990). Hayes (1971) suggests that high-reputation underwriters are able to market larger IPOs. Dunbar (2000) found that the level of underpricing of IPOs managed by established banks have a significant effect on the IPO market share of the banks. High-reputation investment banks may signal less uncertainty relating the IPO and therefore register less underpricing (Carter et el., 1998; Carter and Manaster, 1990; Megginson and Weiss, 1991; Reber and Fong, 2006). High-reputation investment banks will have more experience in advising and underwriting IPOs and will also protect their reputation as effective advisors and underwriter. Nanda and Yun (1997) found that the effect on the wealth of public listed

underwriters by the moderately underpriced IPOs is positive, and insignificant when the underpricing is extreme.

The aforesaid factors signal to investors that the investment bank will ensure the success of the public offering (Daily et al., 2003).

The majority of empirical studies support the negative relationship between investment bank (underwriter) reputation and underpricing (Beatty and Ritter, 1986; Carter et al., 1998; Carter and Manaster, 1990; Johnson and Miller, 1988; Logue, 1973).

As a result of the two competing models, the direction of the relationship between underpricing and investment bank's reputation is not obvious. Loughran and Ritter (2004) however suggest that the negative relation between underpricing and investment bank reputation observed in the 1980s reversed itself in the 1990s although no explanations have been provided for the reversal.

In line with results of the previous studies (Beatty and Ritter, 1986; Carter et al., 1998; Carter and Manaster, 1990; Logue, 1973) this research hypothesizes that high-reputation investment bank will reduce uncertainty and produce lower underpricing.

H11: Underpricing is negatively related to the investment bank reputation.

(ii) Auditor reputation

Before an IPO firm appoints its investment bank and law firm, its auditor would have been more actively involved with the firm's development at a much earlier stage (Beatty and Welch, 1996). Titman and Trueman (1986) suggests that high-quality firms will appoint high-reputation auditors. The appointment of high-reputation auditors act as a strong signal as high-reputation auditors will yield less to instructions from the firm's management and shareholders and will be more discriminating in their audits (Daily et al., 2003; Feltham et al., 1991). Previous studies found a negative relationship between auditor reputation and underpricing (Beatty, 1989; Feltham et al., 1991; Marshall, 2004;

Michaely and Shaw, 1994). In line with assumption that high-quality auditors are associated with less uncertainty, this research hypothesises that high-reputation auditors produce lower incidence of underpricing.

H12: Underpricing is negatively related to the auditor reputation.

1.8.2.5 Ownership Model

H13 relating to retained shareholding is based on the ownership model.

(i) Retained shareholding

The proportion of shareholdings retained by the pre-IPO shareholders is disclosed in the IPO prospectus. While it is a signal which can be observed, it is not a signal which can be easily imitated as the pre-IPO shareholding is fixed prior to the IPO (Daily et al., 2003). The proportion of the shareholdings held by the pre-IPO shareholder signals their faith in the firm's prospects and also indicates that the firm's goals are aligned with the goals of the potential investors (Daily et al., 2003). A high proportion of shareholdings signal greater confidence of the pre-IPO shareholders in the firm's future (Daily et al., 2003). Therefore higher shareholding retained by the pre-IPO shareholders is viewed positively by investors (Hanley, 1993). Jensen and Meckling (1976) established the positive relationship between managerial shareholding and firm value based on the same argument. Habib and Ljungqvist (2001) suggest that the extent to which pre-IPO shareholders sell their shares will determine their interest in the level of underpricing. They argue that pre-IPO shareholders who sell smaller number of shares only experience losses marginally while shareholders who sell bigger number of shares have the incentive to underprice at lower rate.

H13: Underpricing is positively related to the proportion of the retained shareholding.

1.8.2.6 Liquidity Model

H14 relating to subscription rate is based on the liquidity model.

(i) Subscription rate

Subscription rate represents the level of demand by investors and measures the number of times an IPO has been subscribed. High subscription rate for an IPO firm reflects the confidence of investors in the firm's prospects. Chowdhry and Sherman (1996) also suggest that high level of oversubscription may also explain underpricing based on the assumption that there was an information leakage during the IPO. Kenourgios et al. (2007) concludes that oversubscription is a pure signal to potential investors that the IPO shares are underpriced and when investors realise ex-*ante* that the IPO price is fixed too low, the IPO will be significantly oversubscribed. The demand shares of the firm will continue even on the first day of trading as investors who did receive the IPO shares will purchase the shares in the open market after listing. Chemmanur (1993) and Beatty and Ritter (1986) suggests that underpricing will be highly influenced by oversubscription if the over-subscription captures the quality of the IPO firm. Yong et al. (2001) and Yong and Esa (2003) found significant correlation between underpricing and subscription rate.

H14: Underpricing is positively related to the subscription rate.

1.8.2.7 Investors' Sentiment Model

H15 relating to stock market performance is based on the investors' sentiment model.

(i) Stock market performance

Cassia et al. (2004) hypothesises that market sentiment prior to the IPO is perceived as risk as well as opportunity. When the market is in turbulence, underwriters have the

incentive to undervalue the firm and underpricing is consistent with their aversion to risk. However, underwriters may take advantage of the market sentiment and divergence of expectations to capture the most optimistic investors by underpricing (Cassia et al., 2004). A proxy for investors' sentiment is the stock market performance. Research has shown that higher underpricing is recorded during rising markets (Ibbotson and Jaffe, 1975; Ritter, 1984; McGuinness, 1992; Suchard and Woo, 2003). Dimovski and Brooks (2004) found a significant positive relationship between underpricing and stock market performance.

H15: Underpricing is positively related to the stock market performance.

1.9 Potential Contribution of the Research

This research contributes to the research of IPOs and underpricing in a number of ways.

Firstly, it investigates the influence of the government policy on valuation of firms in the equity market. Specifically, it investigates the level of underpricing in Bumiputera and non-Bumiputera IPO firms. This will reveal the perception of investors in the context of valuation of the two categories of firms. Secondly, it investigates the role of institutions and high net worth investors in influencing the level of underpricing. The results will show whether, through placement shares, institutions and high net worth individuals play a stabilizing role through lower underpricing.

This research also investigates whether the information disclosure regime imposed by the Securities Commission assists the investors in their valuation of IPO firms. As the regulator has required more stringent quality information as well as transparency, underpricing should decrease over time. Finally, this research investigates the variables which are related to underpricing against results from other studies.

The answers to the research questions will assist Malaysian firms to determine the optimum level of underpricing required to fully distribute the IPO shares on offer. In addition, the research questions will assist the investing community in making

investment decisions on IPOs by examining the variables which are related to underpricing and consequently enhance their returns.

This research is significant as a contribution to the general body of knowledge relating to corporate finance and IPOs in Malaysia. I am not aware of previous studies on the influence of the listed firm/entrepreneur shareholder on the valuation of IPO firms and the resulting underpricing level.

1.10 Organisation of the Remaining Chapters

This dissertation comprises five chapters. The first chapter is the introduction, the second chapter provides a review of the literature on IPO underpricing, the third chapter sets out the methodology used in this research, the fourth chapter discusses the research results and the last chapter contains a summary and conclusions of the findings.

The first chapter summarises the research by setting out background information on underpricing, the peculiarities of the Malaysian stock market, problem statement, research objectives, research questions, research framework, hypotheses and the potential contribution of this research.

Chapter two provides a review of the relevant literature on IPO underpricing and previous empirical studies which are related to this research.

Chapter three explains the research methodology used in this research. The chapter first describes the research design and objectives. The details of the data sources and data collection methodology employed are then explored. It then restates the research questions and hypotheses, and discusses how the dependent and independent variables are operationalised in this research. It then sets out the statistical methods used to analyse the data and answer the research questions. The last section of the chapter sets out the limitations of the research.

Chapter four reports the results of the analysis and hypotheses testing. The hypotheses are tested using the SPSS software. The report sets out the analysis of data with descriptive statistics followed by Spearman rho correlation test to determine if certain independent variables are related to the dependent variable. The results of this research are then compared with previous studies.

Finally, Chapter five is the concluding chapter of this research. It presents a summary of the research results, evaluates the conceptual framework, discusses the implications of the research results, sets out the limitations of the research and discusses recommendations for research opportunities.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

IPO is a critical milestone in a firm's history. It is the first issue of a firm's shares to the public investors. One of the key decisions to be made by the pre-IPO shareholders of a firm and its advisers is the offer price of the firm's shares at which it will be offered to the public investors. Upon listing of the firm's shares, the capital market will assign a market price to the shares, but the initial offer price must be determined by the IPO firm.

Financial data since 1970s shows that it is common to observe the IPO offer price to be lower than the price the capital market assigns to a firm's shares on the first day of trading (Carter and Manaster, 1990; Certo et al., 2001; Rock, 1986). This implies that the capital market is willing to assign a higher value on the shares compared to the offer price to sell the shares. Ibbotson (1975) found that IPOs are underpriced by an average of 11.4% discount over the opening price for the period between 1960 to 1969, while Ibbotson and Jaffe (1975) found an average excess return of 16.8% over the offer price for the period 1960 to 1970. Ibbotson (1975) called the phenomenon a "mystery". This phenomenon is referred to as underpricing.

Underpricing is one of the three well-documented anomalies associated with IPOs (Rajan and Servaes, 1997; Varshney and Robinson, 2004). The two other anomalies are hot issue market and long-run underperformance. Underpricing is also the performance indicator predominantly used by researchers in investigating IPOs (Daily et al., 2003).

Underpricing is defined as the difference between the offer price and market clearing price at the point of issuance (Beatty, 1989). Underpricing is computed against the closing price of a share on the first day of trading (Barry and Jennings, 1993; Ibbotson, 1975; Ibbotson and Ritter, 1995; Ibbotson et al., 1994). An IPO is said to be

underpriced when the closing price is higher than the offer price. Researchers use the terms “underpricing”, “initial return” and “first-day returns” as synonyms (Loughran and Ritter, 2004) and as synonym with “money left on the table” (Loughran and Ritter, 2002). The benefits of overpricing accrue to the IPO firm or its owners while the benefits of underpricing accrue to the IPO investors (Barry and Jennings, 1993).

Loughran et al. (1994) and Ritter (1998) suggest that underpricing of IPOs is a global phenomenon which occurs in every country with a stock market, although the rate of underpricing varies from market to market. The underpricing phenomenon has been observed over time periods as well as across capital markets. Loughran and Ritter (2004) found that in the 1980s, the average first day returns was slightly over 7%, which increased to 15% in the 1990s, and jumped to 65% during the internet bubble years of 1999-2000. In the post-bubble period of 2000-2003, the average first day returns were approximately 12%. Loughran et al.’s (2013) data for 49 countries shows average initial returns of between 4.2% (in Russia for 1999-2006) to 264.5% (in Saudi Arabia for 2003-2010).

Researchers identify capital raising as the principle objective of going public (Chemmanur and He, 2011; Draho, 2004; Rock, 1986). However, since IPO firms can also access capital through debts or through placing their shares with private investors, it is puzzling why IPO firms leave substantial amount of money on the table through the IPO and consequently earning less through the IPO proceeds.

However, there are researchers who argue that underpricing is not a waste and has certain purpose and that the benefits gained from underpricing exceeds its costs (Carter and Dark, 1992; Cheung and Krinsky, 1994; Daily et al., 2003; Dolvin, 2005; Ibbotson, 1975; Leland and Pyle, 1977).

As underpricing has been persistent in a number of studies since the 1970s, a number of competing hypotheses have been formulated to explain the underpricing phenomenon. Research data also show a number of variables influences underpricing while certain other variables do not show any influence on underpricing.

The objective of this chapter is to analyse the literature related to underpricing and the factors which influenced underpricing.

2.2 Theories of Underpricing

Researchers have formulated a number of theories to explain the underpricing phenomenon. These theories are not mutually exclusive and the relevance and applicability of the theories are dependent on the capital market being studied, the nature of relationship between the IPO firm, its investment bank and the investors and as well as the period of study (Loughran and Ritter, 2004). The theories discussed are broadly categorised into four main groups as set out in Ljungqvist (2007): (i) asymmetric information theories; (ii) institutional theories; (iii) ownership and control theories; and (iv) behavioural theories.

2.2.1 Information Asymmetry Theories

The information asymmetry theories are based on the argument that the insiders of the IPO firm possess more information compared to the potential investors. The five explanations under these theories s are: (i) winner's curse model; (ii) underpricing as a signal of quality model; (iii) principal-agent model; (iv) investment bank's monopsony power model; and (v) certification model.

2.2.1.1 Winner's Curse Model

As a consequence of information asymmetry, in this model, informed investors compete with uninformed investors only for the underpriced issues. This creates an adverse selection mechanism in which uninformed investors obtain shares in overpriced issues with greater probability. Rock (1986) names this phenomenon the "winner's curse" since the uninformed investors will receive a small proportion of underpriced issues (due to the rationing mechanism applied to the oversubscribed issues) and win a large

proportion of the overpriced issues. He further claims that shares must be underpriced on average to induce uninformed investors to participate in the IPO market despite the adverse selection that favours informed investors.

The parties involved in an IPO exercise are the IPO firm, the pre-IPO shareholders, the managers of the firm, the firms advisors' on the IPO exercise such as the investment bank, auditors, legal advisors, the underwriters, and the investors subscribing the IPO shares. In conducting a transaction, if one party possess information which the opposing party does not, then information asymmetry is said to exist between the two parties.

When a firm goes public, pre-IPO shareholders and management and other insiders such as their investment bank and underwriters have superior information about the firm compared to the potential investors (Beatty and Ritter, 1986; Carter and Manaster, 1990; Leland and Pyle, 1977; Rock, 1986). The insiders have access to substantial volume of information on the firm's businesses, operations, culture and future financial prospects (Cohen and Dean, 2005; Leland and Pyle, 1977).

Investors cannot be certain about an issue's value upon commencement of trading despite being underpriced and the uncertainty is labelled as "ex-*ante* uncertainty" (Beatty and Ritter, 1986). They argue that the expected underpricing will be greater when the e*x-ante* uncertainty is greater. Since firms only go public once, investors would be perceive there is no incentive for the firms to underprice. As such, if investors cannot be assured somehow that the firms are leaving money on the table the IPOs might become a failure.

Asymmetric information leads to uncertainty on a firm's value and as asymmetric information increases ex-*ante* uncertainty, it also consequently amplifies underpricing (Gunther and Rummer, 2006). To reduce the ex-*ante* certainty and underpricing, certain positive information on the firm can be released to potential investors such as the age and size of the firm and industry prospects.

Akerlof (1970) state that consequent to information asymmetry, two types of information barriers arise, namely adverse selection and moral hazard. Adverse selection arises when the party to a transaction is not sure about the information provided by the opposing party (Eisenhardt, 1989; Mishra et al., 1998). Moral hazard occurs when IPOs are underpriced to minimise the risk of undersubscription (Ibbotson, 1975) or to minimise the efforts to market the IPO (Baron, 1982).

The Securities Commission of Malaysia and Bursa Malaysia have set out legal requirements on the minimum information which must be presented in the public documents such as in the IPO prospectus. Further, potential investors may also inform themselves through analyst's newsletters and financial publications as well as seeking advice from their financial consultants who may have access to superior information. Nonetheless, the pre-IPO shareholders and their advisers, being insiders, would always have superior information compared to the potential investors.

Another factor contributing to the information asymmetry is that pre-IPO shareholders do not have incentives to broadly reveal financial and operational information as they will lose competitive edge as their competitors will also be able to access the information.

Information asymmetry which affects the pricing of IPOs can arise due to two forms of "informational frictions" – IPO firms have superior information about its businesses and consequently pre-IPO insiders are also exposed to the opportunity and incentives to misrepresent the firm's future prospects (Benveniste and Spindt, 1989; Riley, 1979; Spence, 1976). As such, an IPO may be classified as a moral hazard as pre-IPO insiders may be motivated to misrepresent the firm's prospects to potential investors with the objective of obtaining higher returns (Leland and Pyle, 1977).

Information asymmetry and potential opportunism on the part of pre-IPO shareholders creates uncertainty in the capital market, and leads to lower offer price, higher cost of issue, reduction in the pre-IPO shareholders' wealth-creation, and higher risk for IPO investors (Carter and Manaster, 1990; Certo et al., 2001; Rock, 1986). As a result of information asymmetry and potential opportunism, investors may discount certain

information on an IPO firm's prospects and seek higher quality signals (Carter and Manaster, 1990; Downes and Heinkel, 1982; Megginson and Weiss, 1991; Spence, 1976). As such, information asymmetry would still prevail even if insiders provide all the information they possess on the firm as outsiders would not necessarily trust the information provided (Riley, 1979; Spence, 1976).

While information asymmetry exists between insiders and investors, it is also possible that informational asymmetry exists across investors. Rock's (1986) winner's curse model explains the underpricing phenomenon where there exist a category of investors who are in possession of superior information compared to the firm insiders and other investors. One category of investors who may have superior information compared to another category of investors is the institutional investors. While the firm and other insiders may possess more information compared to any single investors, collectively the investors would possess more information. Further, when there is excess demand for the issue, the shares will be rationed. Under his model, Rock assumes that when good issues are made at the expected price, the investors with superior information would crowd out the uninformed investors, and when bad issues are made, they will decline to participate. This results in a "winner's curse" on the uninformed investors: in attractive issues, they will be crowded out by the informed investors while in unattractive issues, they will be allocated all the shares that they demand for. Consequently, the average returns of the uninformed investors would be below the return from underpricing generally.

The above scenario would result with the market being populated by informed investors while uninformed investors would not be willing to participate due to the negative expected return. As such, Rock (1986) states that the firm will price the IPO at a discount to ensure uninformed investors subscribe the issue. Rock's (1986) model incorporates both information asymmetry and rationing and assumes discount as a natural consequence of the model. Rock (1986) posit that underpricing occurs for two reasons, firstly as a form for the uninformed investors who know information asymmetry exists, and secondly, to induce the uninformed investors to participate in the future offerings of the firm.

Rock's (1986) model assumes that since the firms need to raise capital through the IPOs, underpricing is the key to ensure continued participation from the uninformed investors in the IPO market (Ljungqvist, 2007). Ljungqvist (2007) argues that the aforesaid scenario creates opportunities for individual IPO firms to underprice at a minimum level.

IPO firms generally have the incentive to reduce information asymmetry and the consequent adverse selection problem between informed and uninformed investors as underpricing is an involuntary cost to them (Ljungqvist, 2007). Since IPO firms are motivated to reduce underpricing, underpricing will be reduced up to a level where the marginal cost equals the marginal benefit (Habib and Ljungqvist; 2001). The marginal benefit is equivalent to the reduction in the IPO firm's wealth loss which the underpricing derives.

Ritter (1991) proposes that IPOs are underpriced because investors may systematically be too optimistic about the prospects of the IPO firms. This is evidenced through the oversubscription, and when investors who receive fewer allocated shares try to purchase from the market on the first day of trading, it results in a higher market price and a positive initial return for the IPOs.

Generally, research on IPO underpricing suggests that information asymmetry exists between firm insiders and firm outsiders (Carter and Manaster, 1990; Certo et al., 2001; Daily et al., 2003; Rock, 1986). However, there are researchers who suggest that firm insiders are actually better informed than outsiders and underpricing occurs as insiders undervalue their firm's prospects (Mayer and Vives, 1993).

However, since insiders are involved in the running the day-to-day affairs of the business of the firm, the prospects of the firm would be clearer to them compared to the outsiders. Insiders would have better understanding of the firm's business model (Megginson and Weiss, 1991; strategy (Moreton and Zenger, 2006), management quality (Cohen and Dean, 2005); knowledge base (Grant, 1996, 1996; Liebeskind, 1996), and future growth opportunities (Dolvin, 2005; Megginson and Weiss, 1991).

Although attempts can be made to reduce information asymmetry, and the degree of information asymmetry might differ from firm to firm, some degree of information asymmetry will always prevail (Carter and Manaster, 1990; Dolvin and Pyles, 2006; Megginson and Weiss, 1991).

Ljungqvist (2007) states that the winner's curse model is based on the assumption that if the allocation of the IPO shares are adjusted for rationing, then the uninformed investors' returns would be zero. The aforesaid reasoning has been confirmed by Koh and Walter (1989) and Levis (1990).

Koh and Walter (1989) tested the winner's curse model in Singapore where oversubscribed IPOs are allocated by way of a random ballot whereby all investors applying for the same number of shares have an equal chance of being allocated the IPO shares. Koh and Walter's study of 70 IPOs between 1973 and 1987 found that the probability of being allocated shares was negatively correlated the level of underpricing. After adjusting for rationing, the underpricing dropped substantially from 27% to 1%.

A similar study was conducted by Levis (1990) involving 123 IPOs between 1985 and 1988 in the United Kingdom which entails offer for sale of shares at pre-determined price. The IPOs were undertaken under the rules which require that when there is oversubscription, the allocations will be made on a pro-rated basis. The study found underpricing at 8.64% for the sample but it declines to 5.14% for small and medium sized allocations. Hence, both studies show that small investors' returns are reduced by rationing.

2.2.1.2 Signalling Model

Due to information asymmetry between the IPO firms and investors, firms will have to send a signal to investors to inform them about the quality of the firm. This model suggests that firms use underpricing to signal the quality of the firm. Ibbotson (1975) proposed that firms can signal the quality of the firm to investors through underpricing.

When the qualities of goods sold are heterogeneous and buyers cannot distinguish the quality of the products, sellers would then have the incentive to pass-off low-quality goods as high-quality (Akerlof, 1970). Consequently, as buyers will be aware of the situation, they will not be willing to pay for high quality price. As a result, sellers of high quality goods will either have to sell at a lower price, or will not sell at all.

Information asymmetry gap between buyers and sellers would be erased if the sellers can develop a way to communicate clearly that they know the level of quality of their goods. Akerlof (1970) and Spence (1973) point out that one of the solutions to address the asymmetric information problem is through signals. Although the aforesaid scenario relates to market for goods, the same argument can be applied whenever one party is buying something and another is selling something and the party buying cannot thoroughly evaluate the quality and features of an item being bought.

When an IPO firm has high quality information about its value compared to investors, it can use underpricing to signal its true value (Ljungqvist, 2007). While it is costly, signalling allows the firm to undertake a secondary offering at a later date. Ibbotson (1975) who first proposed signalling in IPOs research suggests that firms underprice to "leave a good taste in investors' mouths".

The insiders of an IPO firm can take steps to reduce information asymmetry by releasing signals to the potential investors. The signal must incite a potential investor to take action, that is, to purchase the IPO shares. It can be undertaken by way of creating signals to the potential investors that the firm is legitimate, has a viable business, has good future prospects, has high earnings potential, is in the growth industry, has intellectual property, and therefore its shares are a good investment (Spence, 1976; Leland and Pyle, 1977; Carter and Manaster, 1990). Shareholders of firms with high future prospects (compared to the average firms) will attempt to communicate the potential of their firms through such signals (Spence, 1976). In the context of an IPO firm, the quality referred to can be such things as industry growth and intellectual property.

There are three major types of signals: index signal, assessment signal and conventional signals (Donath, 2007, Smith and Harper, 2003).

For index signal, the quality which is communicated by the signal must exist otherwise the signal cannot be given if the quality does not exist. In the context of IPO, index signal would be the certification of an IPO by a high quality investment bank or underwriter. In order for the certifier to be credible, it must be costly for it to provide a wrong signal. An investment bank or underwriter which erroneously certifies an IPO will lose its reputational capital and as a result its future business. With assessment signals, the signal quality is determined by the real attributes of the signal, and therefore they must be reliable and cannot be faked (Donath, 2007, Smith and Harper, 2003).

Conventional signals represent certain quality or characteristics by convention and can be easily faked. The level of quality of the conventional signal is not necessarily represented by the signal and the message design maybe ambiguous, and therefore the signals may be falsified (Guilford and Dawkins, 1995). The conventional signal can only be relied upon when the cost of deception is high.

It may be argued that certain signals may be dominated by other more effective ones, and firms have the option to choose a wide range of signals other than underpricing (Ljungqvist, 2007). Other forms of signals available to firms which can perform the function of certification of quality are underwriters' and auditors' reputation (Booth and Smith, 1986; Titman and Trueman, 1986), and venture capital investors (Megginson and Weiss, 1991). Hughes (1986) also suggests the appointment of quality board of directors, particularly independent directors, as a quality signal.

It must be noted that subsequent to Allan and Faulhabers's (1989) original paper, a number of empirical studies investigated the relationship between firm quality and underpricing and found that the results were inconsistent. Ghosh (2000) found that high quality firms tend to underprice more whereas Aggarwal and Rivoli (1990) found no relationship between the two.

While all signals are used to communicate certain quality, not all signals are equally good communicators. Spence (1973) contends that while signals can have varying degrees of reliability, only reliable signals can communicate the existence of certain quality without raising any doubt. Spence (1973) also argues that in order for signals to be reliable, providing a wrong signal must be costly. Hence, a signal is only credible if the benefit of false certification does not outweigh its cost.

If a firm can leave so much money on the table through underpricing, it sends a signal that it must be successful. Underpricing can be said to meet the criteria necessary to be a signal of a firm's quality when it fulfils the following four criteria. Firstly, there must be information asymmetry between the insiders and potential outsiders the IPO firm wishes to attract. Secondly, to be a signal of a firm's quality, it must be addressed to a group of people and in the case of an IPO, the potential investors and other stakeholders (Nelson, 1974). Thirdly, for low quality firms, it must be costly to send a signal of high quality (Certo et al., 2001; Johnstone and Grafen, 1993; Spence, 1973). Fourthly, the signal must be noticeable to the stakeholders. Although firms can signal their quality through other means such as expensive corporate office, appointment of high calibre individuals as directors, or expensive public relations exercise through the media, however underpricing is the most efficient signal to reach potential investors.

Allen and Faulhaber (1989) contend that firms hold the best information on their future prospects. Good firms send a credible signal that the firm is good for investors as only good firms can realise their losses from post-IPO performance while bad firms cannot recoup their losses from underpricing, and accordingly cannot afford to signal (Allen and Faulhaber, 1989). Through underpricing, good firms condition their investors to more favourable post-IPO dividend results. The model also supports Ibbotson's (1975) conjecture that underpricing of IPOs "leave a good taste in investor's mouth" and enable the IPO firm to undertake secondary offerings at attractive prices.

Welch (1989) used the information asymmetry theory to develop a two-period signalling model in which firms with superior information act rationally in a perfectly competitive market. Welch's (1989) main assumption is that low-quality firms could mimic high-quality firms and in order to appear as high-quality firms, owners of low-

quality firms must incur imitation costs. However, the quality of the firms will be revealed post-IPO and before a secondary offering. Therefore, low-quality IPO firms can either invest in imitation and risk the possible loss if discovered, or they can reveal their true quality and forego the higher price they might have attained at the IPO and at the secondary offering had their imitation not been discovered (Welch, 1989). Welch show that the additional costs of underpricing can encourage low-quality firms to reveal their quality voluntarily when imitation costs alone is not adequate.

Welch's (1989) model has three distinctive characters. Firstly, information asymmetry exists as result of the firm's owner knowing more than the investors about the firm's value. Secondly, underpricing is undertaken by high quality firms whose quality cannot be communicated to the market. Thirdly, the model implies that high-quality firms use underpricing as a signal.

Welch (1989) argues that underpricing is compensated by a higher price at the secondary offering. The model proposes that by choosing both the price and proportion of securities offered at their IPO, IPO firms pursue a multiple issue strategy. As such, Welch's model would be irrelevant if the IPO firm does not subsequently undertake a secondary offering.

Most researchers explain that underpricing serves a direct purpose. Allen and Faulhaber (1989) and Welsh (1989) however argue that underpricing has an indirect purpose, that it is a signal IPO firms use to draw the attention of potential investors to its secondary issue. Since underpricing is essentially a waste of proceeds, only high quality firms can afford to waste their potential proceeds and use underpricing as a signal of its high quality. However, this argument is not supported empirically as the objective of signalling in this scenario is to draw attention of investors to future issues (Chemmanur, 1993; Jegadeesh et al., 1993).

Another point of view which should be considered is that underpricing only becomes a obvious signal after the IPO (after trading of the firm's shares commences) and accordingly, any investors who invested prior to the IPO are not the targeted recipient of the signal. Hence, if the firm is using underpricing as a signal of its quality, then its

objective is to address the information asymmetry between the insiders and post-IPO investors.

Allen and Faulhaber (1989) contend that underpricing is only one of the signals which may be used to signal information. However, underpricing as a signal does not require monitoring as investors will directly receive the benefit and the publicity it generates is more valuable to the IPO firm if the firm succeeds than it fails (Allen and Faulhaber, 1989).

IPO generates substantial media coverage, publicity and exposure for the IPO firm (Demers and Lewellen, 2003). Underpricing further increases the visibility of the IPO firm to the public. Researchers show that underpricing increases media and analyst coverage and public visibility of the firm (Aggarwal et al., 2002; Chemmanur, 1993; Demers and Lewellen, 2003). As such, IPO firms will use underpricing to signal their quality to a wide range of stakeholders such as customers, new distributors, suppliers, and future employees.

Both Grinblatt and Hwang (1989) and Welch (1989) contend that underpricing of the IPO would enable the firm to issue more securities at a later date. Bad IPO firms which signal on the other hand run the risk of their true state being uncovered and accordingly do not benefit from the underpricing.

There are instances where IPO firms together with their investment bank embark on a road show to provide information about the firm to potential institutional investors. In Malaysia, road shows are strictly opened to institutional investors only and are undertaken when the IPO involves significantly high volume of shares on offer and which may not be fully subscribed by the retail investors. Road shows entail the book building phase of the pre-selling period. In the road show, the firm and investment bank may obtain feedback from institutional investors on their valuation of the firm, and also the likely demand for the IPO shares. The firm and its investment bank will price the IPO after considering the information collected from the institutional investors. Benveniste and Spindt (1989) explain the aforesaid scenario as the “costly information hypothesis”. They state that the eventual underpricing may be considered as

compensation to the institutional investors for revealing information they possess. The book building exercise enables the firm and investment bank to determine the pricing of the IPO easily and in a less costly manner.

In Malaysia, where the IPO entails offering to specific institutional investors, while the volume of shares allocated to institutional shareholders is substantially large compared to the retail investors, the offer price to the institutional investors is also usually higher then the retail investors. Hanley (1993) examined the final offer price from the price range disclosed in the prospectus and found that the underpricing is greater when the final offer price is greater than the upper limit of the price range. Underpricing is greater to compensate for the feedback from the institutional investors on the IPO. Hanley (1993) explains through her partial adjustment model that the firms do not lose out from the greater underpricing as although they leave money on the table, they eventually receive higher proceeds by adjusting the offer price upwards. Loughran and Ritter (2002) however state that Hanley's (1993) model is not convincing as underwriters do not always incorporate all public information available to them when setting the IPO price.

Hanley and Wilhelm's (1995) empirical results supports Hanley's (1993) explanation. They found that institutional investors gain a larger portion of the higher returns from the IPO compared to the retail investors. Hanley and Wilhelm (1995) argue that institutional investors are allowed to enjoy their favoured status in underpriced offerings with the expectation that they will participate in the less attractive issues as well. Hanley and Wilhelm (1995) also show that, in the United States, there is very little difference in respect of the volume of shares allocated to institutions in underpriced and overpriced issues. This shows that institutional shareholders do not cherry-pick the best IPOs (Ljungvist, 2007). On the other hand, there are researchers who found that since institutional investors are allocated higher volume of shares in IPOs with high probability to produce high first day returns, they also earn higher returns on their allocation compared to the retail investors (Aggarwal et al., 2002).

Garfinkel (1993) tested the signalling theory of underpricing conjectured by Allen and Faulhaber (1989), Grinblatt and Hwang (1989) and Welch (1989) with a sample of 549

IPOs between 1980 and 1983. The study found underpricing of 10.71% for firms which undertake a reissue of securities while firms which do not reissue registered average underpricing of 10.07%. The study also found that average underpricing for firms with insiders undertaking open market sales is not significantly different from underpricing for firms without open market insider sales. Finally, average underpricing by firms that either reissue or whose insiders sell shares is not statistically different from underpricing by firms which do not undertake a reissue or insider sales. Taken together, the aforesaid findings suggest that signalling is not a significant determinant of underpricing. However, we should note that the proxies chosen for signalling in the study, namely the reissue of equity and subsequent sale of equity by owners and directors, are not the only determinants of signalling.

Garfinkel's (1993) empirical finding is inconsistent with the proposition that underpricing is a signal of firm quality. The study found that, after controlling for other variables which may affect the likelihood of secondary offering and underpricing, underpricing is likely to have minimal signalling effect on the probability of a secondary offering and abnormal return from the secondary offering. The study also found that, after controlling for ex-*ante* certainty, underpricing has no significant effect on the probability of insiders disposing their securities in the open market.

McGuinness (1992) empirically examined the levels of underpricing of IPOs in Hong Kong between 1980 and 1990 and found that the role of underpricing as a signal of intrinsic value of a firm as conjectured by Allen and Faulhaber (1989) and Grinblatt and Hwang (1989) and Welch (1989) is not supported by his sample.

Hill and Wilson's (2006) empirical analysis of 502 IPOs from January 1991 to December 1998 on the London Stock Exchange found empirical support for the hypothesis that IPO returns correlate with the extent of anticipated value gains on flotation. The study also found that underpricing is driven by both underwriters and the directors of the issuing firm. The authors provide two alternatives but mutually non-exclusive mechanisms to explain the anticipated gains on flotation and underpricing. Firstly, since the directors of the IPO firm expect gains on flotation, they would be inclined to provide investors with positive return at the IPO. The explanation is in line

with Loughran and Ritter (2002) who argue that pre-IPO shareholders are willing to tolerate underpricing if their own holdings increase in value substantially. Secondly, underwriters have an incentive to underprice as the gains from underpricing, that is, the long run profits from the repeat business of the IPO firms outweigh the losses arising from the lost commission at the IPO. Loughran and Ritter (2002) also argue that underpricing is driven by underwriters in the context of value gain.

The underpricing behaviour of privatisation IPOs in United Kingdom and Australia was the subject of Suchard and Singh's (2007) study. The sample comprises 40 government-owned IPO firms of which 33 IPOs are from UK between the period 1981 to 1991, while the remaining seven are from Australia between 1991 and 1996. The study found that, compared to other privately owned firm IPOs, Australian privatisations are significantly less underpriced while UK privatisations are significantly more underpriced. The study's cross sectional analysis supports ex-*ante* uncertainty, signalling models and the wider share ownership objectives of the governments. However, due to the small sample size, the results of the study may not be conclusive. The study also did not address the influence of government and political factors on the pricing and specifically the level of underpricing.

2.2.1.3 Principal-Agent Model

External parties such as underwriters and investment banks act as agents of the IPO firms. Conflict will arise when the agent attempts to minimise its risks and costs, while it has the obligation to the principal, the pre-IPO shareholders, to ensure the IPO is successfully marketed. The agent has to find a balance between protecting its interest and marketing the IPO shares. This model suggests that external parties who act in their own interests will produce higher underpricing. Logue (1973) argue that when the agent underprices an IPO, it minimises its risks and costs and while its gains favour with the investors, it will lose favour with the principal, the pre-IPO shareholders.

Based on the agency theory, a principal and an agent will not be involved in opportunism if both parties possess the same information (Jensen and Meckling, 1976).

External parties such as underwriters and investment banks have an influence in the pricing of an IPO. Loughran and Ritter (2002) contend that the main cause of underpricing is attributed to the agency problem between IPO firms, and investment banks and underwriters. Ljungqvist and Wilhelm (2003) state that the standard principal-agent models predict that when the agent's interest in the transaction is insignificant, they will expend less effort in monitoring the principal's interest. Ljungqvist (2007) argues that when the uncertainty on the firm's valuation increases, the asymmetry information between the IPO firm and the underwriter will increase, and as a result the value of the underwriter's role in the IPO will increase resulting in higher underpricing. Johnson and Miller (1988) found that high-reputation investment banks are often associated with less risky IPOs resulting in low underpricing.

Logue (1973) examined the factors which influences an investment bank's decisions in pricing an IPO. When an investment bank underprices an IPO, it will minimise its risks and costs, and in the process it loses the favour of the pre-IPO shareholders but gains favour with the investors. Logue argues that severe underpricing will also deter potential IPO firms from appointing the investment bank. On the other hand, if the IPO is overpriced or priced at an equilibrium, the risks and costs of the investment bank will increase and investors will only earn normal or below normal returns and in the case of overpricing, the securities may not be marketable and will deter potential IPO firms from appointing the investment bank (Logue, 1973). Hence, in fixing the IPO price, investment banks will have to find a balance to ensure its risks and costs are minimised and the IPO securities are marketable.

The reputation capital reasoning developed by Klein and Leffler (1981) has been extended by Booth and Smith (1986) and Shiller (1989) to provide explanation on the underwriters' incentive to underprice. Booth and Smith (1986) state that underwriters who are interested to expand or maintain their reputations may intentionally underprice their IPOs and consequently incur losses in the short-term but gain from future profits. Shiller's (1989) "impresario theory" similarly suggests that to enhance their reputation among investors and profit from it in the future, investment banks deliberately underprice as their promotional strategy.

As investment banks are also interested in retaining their market position, they have incentives to ensure new IPOs are sufficiently underpriced but not more so that they will not lose underwriting fees in the future IPOs (Beatty and Ritter, 1986). Hence, Beatty and Ritter argue that investment banks coerce IPO firms to underprice, but they will not underprice too much to ensure they do not lose underwriting fees market share. Hayes (1971) suggests that high-reputation underwriters are able to market larger IPOs. Nanda and Yun (1997) found that the effect on the wealth of public listed underwriters by the moderately underpriced IPOs is positive and insignificant when the underpricing is extreme.

Where there is minimal or no information asymmetry between the IPO firm and the investment bank, the agency models can be used to investigate the underpricing of IPOs. Muscarella and Vetsuypens (1989) tested Baron's (1982) model by investigating the performance of IPOs of investment banks which are marketed by the IPO firms themselves. As the IPO firm and underwriter are the same entity, information asymmetry should not exist as defined by Baron (1982). Further, if there exists other factors unrelated to information asymmetry, then underpricing should be lower in self-marketed investment bank IPOs compared to IPOs in which the IPO firm and underwriter are not the same entity. The study found the IPOs underpriced and it does not give evidence of less underpricing in the self-marketed IPOs. The study's finding is inconsistent with Baron's (1982) theory of underpricing.

When an investment bank is also a pre-IPO shareholder of the firm, often as a result of venture capital financing, its incentive to underprice is reduced as it is detrimental to the IPO firm, and the size of underpricing should be proportional to the size of its shareholdings. This argument is supported by Ljungqvist and Wilhelm (2003) who found underpricing decreases when the investment bank's shareholdings increase. This result contradicts with Muscarella and Vetsuypens's (1989) findings discussed above.

Ljungqvist (2007) proposes that there are two ways for IPO firms to mitigate the agency conflicts, first by monitoring the investment bank's marketing efforts and negotiate intensely on the offer price, and secondly, by designing fees for the investment bank as a function of the offer price.

Loughran and Ritter (2004) explored three non-mutually exclusive explanations to explain the changing underpricing pattern over time: changing risk pattern, a realignment of incentives, and a changing objective function. A small part of increasing underpricing can be explained by the changing risk profile of the firms going public. The realignment of incentives explains that management's incentive to underprice has decreased due to their reduced CEO ownership and higher percentage of IPOs without secondary shares. The changing IPO firm's objective function provides two reasons why firms became more complacent about underpricing in the 1990s and the internet bubble period: the analyst lust hypothesis which argues that choosing the lead underwriter is important for securing analyst coverage, and the spinning hypothesis, which argues that decision makers have an incentive to choose a lead underwriter with a reputation for underpricing.

Muscarella and Vetsuypens (1989) tested the agency hypothesis where there is minimal or no information asymmetry between the IPO firm and the investment bank by investigating the performance of 38 IPOs of investment banks which are marketed by themselves over the period 1979-1987. The study found the sample significantly underpriced by 7.12% and it does not give any evidence of lower underpricing in the self-marketed IPOs.

Loughran and Ritter (2002) tested their agency hypothesis though an empirical analysis of 6,123 IPOs from 1980 to 2000. They observed that in the years when the first-day return is high, valuations were also high. They argued that this is not coincidental as their agency hypothesis predicts that more money will be left on the table when valuations are high. They attribute this to two factors: IPO firms do not bargain hard for higher offer price when the firm owner's wealth is high, and the issuing firms bargain less effectively when wealth increases unexpectedly within a short span of time.

Camp et al. (2006) empirically investigated the agency hypothesis of ownership retention in the context of underpricing. The study incorporates retention as signal of quality of the firm and found that wealth loss for firms is lower than the quantum implied by the underpricing. The studies sample comprises 49 IPOs undertaken between October 1989 and October 2002 listed on the New Zealand Stock Exchange.

Camp et al. (2006) also found that if pre-IPO shareholders retain a high level of ownership in the firm, they are also willing to accept higher level of underpricing. In addition, Camp et al.'s (2006) study of book-build IPOs are also found to be less underpriced compared to price-fixed IPOs as book-build IPO firms have information advantages and accordingly have a chance to price optimally

2.2.1.4 Investment Bank's Monopsony Power Model

Investment banks are largely monopsonistic and their bargaining power against the IPO firms will determine the level of underpricing. This model suggests that the relative bargaining power between the investment banks and IPO firms will determine the level of underpricing.

Based on the foregoing, unless there are mitigating factors, there is an incentive to underprice IPOs. One of the main mitigating factors would be the nature of competition to underwrite an IPO amongst players in the investment banking industry, and Logue (1973) identifies the investment banking industry as largely monopsonistic. The monopsonist's model reveals the relative bargaining power of the parties involved and implies that the greater the IPO firm's bargaining power, the lower the rate of underpricing (Logue, 1973). Another implication of the monopsonist model is that the investment bank will only be responsive to pricing behaviour when their risks and costs increases and will be relatively unresponsive to factors which may be exploited to benefit the IPO firm alone.

Baron (1982) states that the investment banks set the offer price based on their superior information and argues that they intentionally underprice the shares not to indicate the quality of the firm but to facilitate the selling of the IPO shares to the potential investors. By underpricing, the difficulties associated with selling the IPO shares are greatly reduced. In connection with the aforesaid, Baron (1982) proposes the monopsonist hypothesis under which IPO firms accept underpricing as an indirect incentive to the underwriters to sell the IPO shares and to avoid the cost monitoring of the underwriter.

However, Muscarella and Vetsuypens (1989) and Alli et al. (1994) demonstrated that the monopsonist hypothesis is not necessarily true as they found that even IPOs of underwriting firms are significantly underpriced.

Tinic (1988) also argues that the underwriter's risk aversion does not explain why IPO firms do not demand the underwriters to adjust the underwriting spreads to compensate for the risks of the IPO. Tinic also argues that the monopsonist model, firstly, does not explain why some underwriters decline to participate in certain IPOs, and secondly, that there are sufficient niche underwriters who seek for new business. In addition, Tinic argues that the monopsonist model implies that IPO firms are either ignorant or irrational.

2.2.1.5 Certification Model

In order to reduce information asymmetry, third-parties involved in an IPO such as investment banks, underwriters and auditors whose reputation, legitimacy and prestige lends credence to the quality of the IPO firm (Booth and Smith, 1986; Titman and Trueman, 1986). This model suggests that certification by the third parties can mitigate information asymmetry.

One of the focuses of research on credible signals in the IPOs process is third party certification (Carter and Manaster, 1990; Cohen and Dean, 2005; Megginson and Weiss, 1991). Researchers suggest that information asymmetry between pre-IPO shareholders and potential investors can be mitigated through certification on the quality of the IPO firm by independent third parties such as the investment banks and underwriters (the terms are used here interchangeably, although the two are distinctive and the later is a subset of the former), and auditors (Baron, 1982; Booth and Smith, 1986; Myers and Majluf, 1984; Titman and Trueman, 1986). However, between the pre-IPO shareholders and certifiers, it is unclear which one of the two has more influence in reducing the information asymmetry situation.

Certification by third-parties such as investment banks, underwriters and auditors whose reputation, legitimacy and prestige lends credence to the quality of the IPO firm act as signal to reduce information asymmetry on an IPO firm (Booth and Smith, 1986; Titman and Trueman, 1986; Carter and Manaster, 1990; Megginson and Weiss, 1991, Cohen and Dean, 2005). Certification also impacts the cost of issue through reduction of uncertainty of the IPO.

Among third-party certifiers, researchers found that the reputation of underwriters (usually investment banks) has significant influence on the information asymmetry, reduction of the cost of IPO and lower underpricing (Beatty and Ritter, 1986; Carter and Manaster, 1990; Carter and Dark, 1992; Daily et al., 2003; Dolvin and Pyles, 2006).

Titman and Trueman (1986) contends that the choice of investment banker and auditor provides information on the true value of firms. They argue the quality of auditor acts as a signal in IPOs as quality auditors are expected to provide expertise and produce reliable quality financial statements on the IPO firm. Menon and Williams (1991) state that prior to going public, IPO firms will switch auditors from small to larger firms in line with the auditor's reputation.

Baron (1982) states that IPO firms demand investment banking services in the form of advisory and for the distribution of securities as they possess superior information on the capital market when compared to the firm. Under Baron's (1982) model, the investment bank is also viewed as a certifier of the potential returns of the securities, an assurance the IPO firm cannot provide.

Beatty and Ritter (1986) argue that underpricing equilibrium is enforced through the investment banking industry. Three conditions are necessary for investment banks to maintain underpricing equilibrium: they are not able to forecast the after-market price, their earnings potential is based on their reputation capital, and therefore it is non-salvageable; and cheating by overpricing will lose clients (Beatty and Ritter, 1986).

Booth and Smith (1986) hypothesise that an investment bank can play the role of certifying the offer price as being consistent with the inside information on the future

earnings potential of the firm. On the other hand, underwriters can use the prospect of future earnings to reduce underpricing (Benveniste and Spindt, 1989).

Myers and Majluf (1984) state that compared to outsiders, insiders may possess superior information advantages. However, if the insiders are unable to communicate their superior information to outsiders, a situation of market failure would result (Myers and Majluf, 1984). Accordingly, there is an incentive to appoint a third party, for example, an investment bank, to certify the offer price.

Leland and Pyle (1977) cite two problems which hamper firms from communicating information directly to potential investors: the appropriateness, and credibility of the information to potential investors. They argue that the problem can be overcome by having a intermediary and the information will bring returns if investors believe that the intermediary uses quality information. Further, unless there is a signal of quality, the average return would be low.

Carter and Manaster (1990) assert that underpricing is costly to the IPO firms and low risk firms will attempt to communicate the low risk quality to investors. One of the ways for firms to reveal their low risk is by appointing high prestige investment banks as an underwriter. Hayes (1971) also suggests that high reputation investment banks are also to market larger IPOs. The level of underpricing of IPOs managed by established banks have a significant effect on the IPO market share of the banks (Chen et al., 2000).

Benveniste and Spindt (1989) developed their theory to explain the role of underwriters as the institution which improves the economic efficiency of the IPO market. They argue that IPO firms face marketing problems selling their own shares. According to them, underpricing arises naturally as a cost of disclosing their private information about the true value of the shares.

Consistent with Beatty and Welch (1996), Ljungqvist et al. (2006) found correlation between underwriter's reputation and underpricing. Carter and Manaster (1990) provide empirical evidence by examining 501 IPOs between 1979 and 1983 to support their theory that underwriter prestige and marketing of low risks IPOs are associated.

Carter and Manaster's model predicts that the price run-up will be lower for firms which appoint underwriters with greater prestige.

2.2.2 Institutional Theories

There are two explanations under the institutional theories: (i) litigation avoidance model; and (ii) tax advantages model.

2.2.2.1 Litigation Avoidance Model

Investors who are disappointed with the performance the shares after the IPO may file lawsuits against the firm. This model suggests that firms deliberately underprice the IPO shares to reduce the probability of law suits in the event the IPO shares do not perform.

IPO firms and underwriters together with all other professionals such as investment banks, due diligence lawyers and reporting accountants are legally liable for omission of material information from investors. Legal actions against the IPO firms and other professionals are costly, not only directly in the form of monetary compensation, solicitor's fees and management time, but also damage to their reputation. Investors will also lose confidence in investment banks which are prone to legal actions, and their client IPO firms may face rise in their future cost of capital.

Logue (1973) and Ibbotson (1975) hypothesised that firms deliberately issue their shares at a discount to reduce the probability of future lawsuits from investors disappointed with the post-IPO performance of their shares. Tinic (1988), Hughes and Thakor (1992) and Hensler (1995) provided a theoretical link between litigation risk and underpricing of IPOs but they do not claim that litigation risk is the sole factor leading to underpricing. Ljungqvist (2007) contends that the hypothesis is United States-centric as although underpricing is observed in stock markets in every country, strict liability rules are not applied in every jurisdiction.

Ljungqvist (2007) lists countries such as Australia, Finland, Germany, Japan, Switzerland and United Kingdom, where the financial impact arising from of a legal action is not significant but nonetheless registers underpricing. Tinic (1988) and Hughes and Thakor (1992) also argue that underpricing occurs even in countries where litigation risks are minimal.

Tinic (1988), Hughes and Thakor (1992) and Hensler (1995) argues that underpricing is used by IPO firms and underwriters to protect themselves against legal liabilities and the associated reputation risks. Underpricing is therefore a form of implicit insurance against potential legal liabilities which may arise due to negligence in the due diligence and failure to comply with disclosure requirements of the securities regulations (Tinic, 1988).

The United States Congress enacted the Securities Act 1933 ("Act") to ensure that investors are given material information relating to the securities being offered to the public and investors are not exposed to deceit, misrepresentation and other forms of fraud. The Act increased the potential civil liabilities. Under the implicit-insurance hypothesis, it would imply that the IPOs undertaken prior the Act should have been priced at equilibrium while IPOs undertaken after 1933 would record higher initial returns.

To ordinary investors, the cost of undertaking a meaningful analysis of the IPO may not be compensated by the returns from IPO, and hence would rely on the information produced by investment banks which act as the certifiers of the IPO (Tinic, 1988). The securities regulation requires the professionals involved in the IPO to diligently examine, inquire and ensure that all material information relating to the firm be thoroughly examined and disclosed.

Investors who had relied on erroneous information and subsequently experience losses can claim damages from any party involved in disclosing the information, including the investment banks. In addition to financial cost of law, there is the cost for damaged reputation. Tinic (1988) and Hughes and Thakor (1992) argue that the implicit insurance hypothesis explains why IPO firms are willing to leave some money on the

table for investors. In the event civil liabilities arise due to inadequate disclosure of information, the IPO firm will be jointly and severally liable.

Hughes and Thakor (1992) proposed a solution to the litigation risks: a trade-off between two options, minimising the probability of litigation, and therefore the associated costs, against maximising the capital raised from the IPO exercise and the investment bank's fees. Their principal thesis is that the higher the offer price, the higher the probability of litigation. They also assume that in addition to reducing the probability of lawsuit, underpricing will also reduce the chances of adverse court decisions against them as well as the quantum of damages which be awarded to the investors.

Drake and Vetsuypens (1993) suggest that underpricing is not the efficient way to avoid future litigation and argue that litigation avoidance models which attempt to explain underpricing do not specify the period over which underpricing should be observed. In their study of underpriced IPOs, Drake and Vetsuypens observed that the mean and median length of time frame for claimants to start litigation is 14.7 months and 11 months respectively from the date of the IPO. Regardless of whether they bought the securities at the IPO or in the secondary market, plaintiffs can and do sue for damages and whether the IPO was underpriced on the first day is irrelevant to investors who bought the securities in the secondary market (Drake and Vetsuypens, 1993).

Drake and Vetsuypens (1993) argue that evidence from their sample suggest that litigation is triggered by negative news on the financial position of the firm long after the IPO. They however contend that while it is possible that other IPOs had successfully avoided litigation by underpricing, this is not observable and there is a possibility that more firms would have faced litigation if their IPOs had not been underpriced.

Drake and Vetsuypens (1993) also found that for their sample, the stocks declined by 56.7% between the IPO date and end of litigation and conclude that the decision to undertake litigation arises due to the significant deterioration in the stock price on the post-IPO market and not whether the issue was underpriced at the IPO stage.

Lowry and Schwert (2002) highlighted the simultaneity problem where while the IPO sets the underpricing level to reduce potential litigation, the underpricing level they set is a function of the probability of being sued. In other words, the greater the underpricing, the lower the litigation risk, but the greater the litigation risk, the higher the underpricing required (Ljungqvist, 2007). Consequently, the relationship between underpricing and the probability must be examined in the context of the simultaneity problem.

Tinic (1988) tested the litigation avoidance hypothesis by selecting two samples of IPOs: a pre-Act sample comprising 70 IPOs undertaken between 1923 and 1930, against a post-Act sample comprising 134 IPOs undertaken between 1966 and 1971. The test found that excess returns of the pre-Act IPOs averaged 5.17% while the corresponding average for post-Act IPOs was 11.06%. Tinic argues that the significant difference between pre and post-Act samples is consistent with the implicit insurance hypothesis. Ljungqvist (2007) however argues that the difference is not significantly large after taking into account that underpricing varies over a period of time as Ibbotson and Jaffe (1975) discovered. Hence, Tinic's results may have been influenced by other factors.

Drake and Vetsuypens (1993) tested the litigation avoidance hypothesis by investigating the potential relationship between underpricing and probability of litigation by examining of a sample of 93 IPOs between 1969 and 1990 which were sued. This was compared against another sample of 93 IPOs matched on year of IPO, offer size and underwriters' prestige. They found the IPOs which were sued are just as likely to be underpriced as the control sample and recorded mean underpricing of 9.18% for their sample.

They observed that the mean and median length of time frame for claimants to start litigation is 14.7 months and 11 months respectively from the date of the IPO. Drake and Vetsuypens (1993) argue that evidence from their sample suggests that litigation is triggered by negative news on the financial position of the firm long after the IPO. These findings are consistent with the findings of Alexander (1991) who, based on a sample of nine IPOs undertaken in 1983, found that only firms which experienced significant decline in stock prices faced litigation.

2.2.2.2 Tax Advantages Model

Compared to salary increases, gains from underpriced shares attract lower tax. This model suggests that firms deliberately underprice to reward their employees with IPO shares.

Rydqvist (1997) argues that from a tax perspective, underpricing maybe advantageous to the IPO firm. The Swedish employment income tax was higher than capital gains tax and IPO firms opted to reward their employees through underpriced shares in lieu of salaries. In 1990, the government made the gains from underpriced shares taxable rendering the motivations to allocate underpriced shares to employees unattractive. Their study found that for the period 1980 to 1989 underpricing stood at an average of 41% and following the change in the tax regime, underpricing declined by 8% in the 1990 to 1994 period. Reside et al. (1994) studied the effect of the Tax Reform Act of 1986 in the U.S. which raised the capital gains tax and found that, *ceteris paribus*, that amount of underpricing decreased after the implementation of the tax regime.

2.2.3 Ownership and Control Theories

The three explanations under the ownership and control theories are: (i) ownership model; (ii) agency cost reduction model; and (iii) liquidity model.

2.2.3.1 Ownership Model

As information asymmetry exists between insiders of the firm and investors, this model suggests that the proportion of equity held by pre-IPO shareholders signals level of future cashflows of the firm. Leland and Pyle (1977) found the level of underpricing corresponds with the proportion of equity interest held by the pre-IPO shareholders.

There are researchers who argue that underpricing alone is insufficient to signal the quality of the firm (Leland and Pyle, 1977; Grinblatt and Hwang, 1989). They

developed hypothesis that in addition to underpricing, the shareholding structure of the firm can be used as a signal to indicate quality of the IPO firm to explain underpricing.

An IPO exercise will entail changes in the shareholding structure or ownership and control of the IPO firm. Upon listing, the firm's managers are required to release certain information about the firms' actions and performance to the public which will be scrutinised and evaluated. The shareholding structure and control lends incentives to the managers to make optimal operational and investment decisions (Ljungqvist, 2007). An agency problem can arise between the shareholders managing the firm and the shareholders who are not managers if the shareholding structure and control line is not clearly demarcated (Jensen and Meckling, 1976). The managers will be inclined to act to enhance their own wealth instead of acting in the interest of all the shareholders.

Leland and Pyle (1977) developed their signalling model based on the shareholding structure of a firm and inside information held by the insiders of the firm. They argue that information asymmetry exist between the insiders the firm and the potential investors, and potential investors will respond to a signal from an insider if they perceive that sending the true signal is in the self-interests of the insider. Leland and Pyle (1977) examined the proportion of the equity held by the pre-IPO shareholder in the firm as a signal of firm value. The proportion of equity interest held by the pre-IPO shareholders in the firm signals the projected cash flows and the higher the proportion of equity held, the higher the projected cash flows and consequently underpricing (Leland and Pyle, 1977).

Grinblatt and Hwang (1989) expanded Leland and Pyle's (1977) examination of the proportion of equity held by the insider as a signal. They developed a two-parameter model to explain the underpricing of IPOs, that is, the fraction of new issue retained by the IPO firm and the offer price at which the IPO issue is undertaken. They assume IPO firms have better information on the firm's future cash flows compared to outside investors and through underpricing and retaining equity in the firm, the firm signals the true value of the firm. If the pre-IPO investors continue to hold their shares in the firm subsequent to the IPO, hence retaining the option to sell their shares at a higher price, it signals the quality of the firm and its potential future higher value and its shares to

potential investors. Further, the firms have the opportunity to undertake a secondary offering later; hence pre-IPO shareholders maintaining their shareholdings indicate that underpricing is a signal with the pre-IPO shareholders expecting to gain from the initial underpricing.

Contrary to the above arguments, Robinson et al. (2004) found that while low level of shareholdings held by pre-IPO investors who are also managers of the firm may depress the value of the IPO-shares as the investors may fear the managers neglecting their responsibilities, high levels of shareholdings may lead to fear of entrenchment as the managers may act for their own welfare instead of the firm's interest.

2.2.3.2 Agency Cost Reduction Model

The agency cost-reduction model provides two contradictory explanations in relation to underpricing. Under the first explanation, underpricing is used attract high number of investors and consequently dispersing the shareholdings. This will institutionalise the agency cost while avoiding monitoring. Under the second explanation, underpricing is used to allocate large blocks of shares to a few investors to enhance monitoring of the firm by the investors.

Ljungqvist (2007) categorised underpricing within the agency cost into two categories: institutionalising agency cost by avoiding monitoring as proposed by Brennan and Franks (1997), and minimising agency costs by encouraging monitoring as proposed by Stoughton and Zechner (1998).

Brennan and Franks (1997) argue that IPO firms underprice intentionally to generate excess demand for their shares or oversubscription. Under their ownership dispersion hypothesis, Brennan and Franks state that when there is high demand for the IPO shares, the IPO firms will have to ration the shares. The IPO firm will distribute the shares to as many investors as possible to disperse the shareholding in the firm resulting in the shareholding held by each shareholder is minimal. This gives the pre-IPO shareholders and managers to run the firm with little oversight and allows them to pursue decision-

making options which will enhance their own wealth. Dispersing the shareholdings enable the firms to institutionalise the agency cost while avoiding monitoring.

Brennan and Franks (1997) argue that underpricing and broad initial ownership dispersion will only protect the pre-IPO major shareholders and managers if external investors do not purchase significant percentage of shares upon listing of the firm. Brennan and Franks (1997) suggests that large purchases may not result in financial gain as the share price will increase due to large volume purchasing. As such, it is not profitable to purchase large blocks of shares if the objective is to consolidate the share ownership.

Stoughton and Zechner (1998) suggest allocating shares to large outside shareholders who will monitor the firm, is value-enhancing to the pre-IPO major shareholders and managers, as monitoring benefits all shareholders. Hence, to enhance monitoring, managers may allocate large blocks of shares to an investor. However, since the large blocks are not easily diversified, the investor is given another incentive in the form of underpriced shares. Stoughton and Zechner (1998) argues that the underpricing incentive is not an opportunity costs, as the firm's shares will be underpriced anyway since investors expect high agency costs due the lack of monitoring.

2.2.3.3 Liquidity Model

The liquidity model suggests that underpricing is used to increase liquidity of the IPO shares. This will encourage oversubscription resulting in shareholding dispersion and high number of shareholders.

One of the reasons for firms to go public is to increase the liquidity of the IPO firms' shares. Booth and Chua (1996) argue firms underprice their IPO shares to increase liquidity for the firm's shares in the secondary market. This is achieved by encouraging oversubscription which will result in broad shareholding dispersion and high number of investors.

Grossman and Hart (1980) argue that the ownership dispersion also minimises the opportunity of hostile takeovers. With a broad ownership, the transaction costs will also become lower. The underpricing of the IPO shares may also increase trading activities and liquidity and increase the firm's value by relieving discount-disadvantages. Hence, the purpose of underpricing according to Booth and Chua (1996) is to draw the attention of potential investors and draw them their participation in the IPO.

Booth and Chua (1996) examined 2,151 IPOs in the US between 1977 and 1988 to study the relationship between underpricing and liquidity. They find that higher liquidity is associated with the larger level of the underpricing at a significant level. Ellul and Pagano (2006) report the findings of a study on underpricing by complementing traditional explanations with a new theory based on the liquidity of the IPO firm's shares. The database comprises 337 IPOs undertaken on the London Stock Exchange between June 1998 and December 2000. The study found that IPO underpricing is higher for shares featuring lower expected liquidity and higher liquidity risks. The model shows that an illiquid IPO to have higher liquidity risk and is accordingly reflected in the form of high underpricing.

Barry and Jennings (1993) studied the timing of intraday return on the first day of trading of 229 IPOs between December 1988 and December 1990. Their study found that almost all the initial returns due to underpricing happen at the opening transaction. This implies that only subscribers in the IPO benefit from the underpricing.

2.2.4 Behavioural Theories

The three explanations under the behavioural theories are: (i) information cascades model; (ii) investor sentiment; and (iii) prospect hypotheses.

2.2.4.1 Information Cascades Model

The information cascades model suggests that firms use underpricing to create excitement amongst investors to invest in the IPO shares. The excitement will create a cascading effect and an artificial momentum for the shares.

Welch (1992) argues that new issues are intentionally underpriced to create a buying momentum by underwriters. When investors make investment decisions they also take into account other investors' sentiment instead of relying solely on their own valuation of the firm. Therefore, although it contradicts with his own valuation, an investor will invest in the IPO shares if he perceives that other investors are excited with the IPO and will invest. This situation will also create a cascading effect where it creates an artificial momentum for that IPO shares. However, in the event investors hold negative sentiment or are neutral on the IPO, it is likely to cause a negative cascade and investors will not be excited in the IPO. As a result, investors will not participate in the issue although their own valuation is positive and consequently the IPO will fail. Welch (1992) explains that IPOs are intentionally underpriced to create a positive cascade or to overcome the chances of a negative cascade.

Ljungqvist (1992) suggests that cascades gives demand power to early investors for larger underpricing in return for their commitment to subscribe resulting in a positive cascade. However, cascade may only develop if the IPO involves a road show or book building exercise when potential investors can reveal their interest in the shares and feedback on the pricing. However, underwriter may choose not to reveal the feedback received to the market and the cascade will not develop. Therefore, deeper discount in the issue will not be required. The IPO firm may also take advantage of the cascade effect by increasing the number of shares offered to meet the increased demand.

If investors are free to communicate and signals are revealed across the market, then the artificial momentum will not arise and therefore cascades will not happen. However, since free communication will aggregate all the information available and decrease the IPO firm's informational advantage, Welch (1992) argues that cascades actually will benefit the firm.

2.2.4.2 Investor Sentiment Model

The investor sentiment model suggests that when the stock market performance is on the rise, demand from uninformed investors for IPO shares would increase. Consequently, the number of existing investors and new investors demanding IPO shares would also increase. Hence, when the stock market is on the rise, underpricing will also increase.

IPO firms are generally young, immature and information on the firms are generally scarce to outsiders rendering the task of valuing the firm difficult (Ljungqvist, 2007). Ljungqvist et al. (2006) assumes that some sentimental investors optimistically believe in the future prospects of the IPO firm and the firm's objective would be to capture the overvaluation of the IPO shares against the fundamental value of the share. Their reaction would be reflected in the first day trading price of the shares. The firm will only release such number of shares deemed optimal so that excess supply will not depress the share price. However, the market will be able to assess the true value of the shares and prices will reflect the fundamental value. This explains why IPOs produce negative returns in the long-run (Ritter, 1991).

Another factor in relating to investors sentiment is their reaction to the stock market performance and demand for underpricing. Researchers have found a positive correlation between underpricing and the stock market performance (Ibbotson and Jaffe, 1975, Riter, 1984; Suchard and Woo, 2003; Helwege and Liang, 2004). Brau and Fawcett's (2006) survey of 336 chief financial officers found that they consider the stock market performance as the most important factor when deciding on the timing of their IPOs. Based on Rock's (1986) winner's curse explanation, the demand from uninformed investors increase when the stock market performance is on the rise, as a result the number of existing investors and new investors demanding the shares would increase. Hence, when the stock market is on the rise, underpricing will also increase. This scenario also explains why the number of IPOs increases when initial returns are high, as demand for IPO shares increases when the stock market performance is on the rise, otherwise referred to as "hot market" (Ljungqvist et. al, 2006).

Aggarwal and Rivoli (1990) suggest that the principle explanation for underpricing is that IPOs are subject to overvaluation or speculation in the early post-IPO days. Their study finds evidence that investors who purchase shares in the early post-IPO days and holding for one year underperformed the market and there is also no evidence of investors purchasing at the IPO and holding for one year earning abnormal returns.

Aggarwal and Rivoli (1990) attempted to explain underpricing as a speculative bubble through their empirical study of 1,598 IPOs between 1977 and 1987. Their study suggests that underwriters do not systematically underprice IPOs. Aggarwal and Rivoli (1990) suggest that the principle explanation for underpricing is that IPOs are subject to overvaluation or speculation in the early post-IPO days. Their study finds evidence that investors who purchase shares in the early post-IPO days and holding for one year underperformed the market and there is also no evidence of investors purchasing at the IPO and holding for one year earning abnormal returns.

2.2.4.3 Prospect Theory

The prospects theory compares the loss experienced by pre-IPO shareholders due to underpricing against the gains from price increase after the IPO on the equity retained. The prospect theory explains that the pre-IPO shareholders would be more concerned about the net increase in their wealth instead of losses arising from underpricing.

Loughran and Ritter (2002) proposed the prospect theory which describes how choices are made under uncertainty. Instead of focussing on the investors, it focuses on behavioural biases of the insiders of the firm in relation to underpricing. The theory is distinctive as it is not based on expected utility where it focuses on the change in overall wealth instead of focussing on the wealth loss due to underpricing. The theory predicts that in most IPOs, the pre-IPO shareholders will compare wealth loss due to leaving money on the table against the wealth gain from the price increase on the retained equity, thereby producing a net increase in the pre-IPO shareholder's wealth. The theory also attempts to explain why more money is left on the table when market rises compared to when the market falls.

2.3 Summary

Underpricing has been persistent in a number of studies since the 1970s. The principle question at the heart of the debate on the reasons for underpricing is why IPO firms price their shares below the value of the shares as perceived by the investors. Researchers have put forward a number of competing theories to explain the underpricing phenomenon.

Ritter (2003) suggests that the theories put forward to explain underpricing are not mutually exclusive and the relevance and applicability of the theories are dependent on the capital market being studied, the nature of relationship between the IPO firm, its investment bank and the investors and as well as the period of study. Empirical results also show that while a number of variables influences underpricing in certain capitals markets, these results are not replicated in other capital markets. While the underpricing phenomenon has been researched extensively in other markets, research in this area in Malaysia is scarce. Hence, the objective of this research is to fill the gap of knowledge in the area.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology used in this empirical research. The methodology is designed to answer the research questions and for testing the hypotheses. The chapter describes the research design and objectives. The details of the data sources and data collection methodology employed are then explored. It then restates the research questions and hypotheses, and discusses how the dependent and independent variables are operationalized for this research. It then sets out the statistical methods used to analyse the data and answer the research questions. The last section of the chapter sets out the limitations of the research.

3.2 Research Design and Objectives

Bryman (2008) identifies five research designs which can be applied to social research namely, experimental design, cross-sectional design, longitudinal design, case study design and comparative design. This research adopts the cross-sectional research design. Research process generally involves the following: problem definition, development of a theoretical framework, identification of the research objectives, decisions on the method of investigation, data collection, data analysis, and interpretation of findings (Cavana et. al, 2001).

This research adopts the quantitative research strategy which emphasises quantification in data collection and analysis. The epistemological orientation of the research is positivism which advocates the application of the natural science model to the social reality and beyond. The positivist research assumes that there is a set of universal laws out there to be discovered (Cavana et. al, 2001). Under the positivist research, the

purpose of theory is to generate hypotheses which can be tested and which will thereby allow assessment of the explanations of laws (Bryman, 2008).

The positivist research uses deductive approach to the theory-research relationship (Cavana et. al, 2001). The deductive approach begins with the development of a theoretical framework and followed by deduction of hypotheses which will be subjected to empirical scrutiny (Bryman, 2008). Concepts will be embedded within the hypotheses which must then be translated into researchable entities. The objective is to identify a set of universal laws which can be used to predict general systems of human activity (Cavana et. al, 2001). Once the results of the empirical research is obtained, the researcher then takes the induction approach whereby he then infers the implications of the results for the theory which prompted the research exercise.

The ontological orientation of this research is objectivism. Objectivism assumes that social phenomena and their meanings have an existence that is independent and confronts the researcher as external facts. It implies that the social phenomenon is not within the reach or influence of the researcher (Bryman, 2009).

The objectives of this research are: (i) to determine the level of underpricing in IPOs in Malaysia; and (ii) to identify the factors which influence underpricing.

3.3 Data Sources and Data Collection

The data for the research were obtained from the following sources:

(i) the data on first day closing price, subscription rate and stock market performance were obtained directly from Bursa Malaysia;

(ii) the data on firm age, size, nature of share offer (that is new issue, proportion of secondary shares and proportion of placement shares), gross proceeds, identity of the shareholders of the firm and their respective shareholdings, retained shareholding, name

of investment bank and auditor, and the offer price were obtained from the respective firm's prospectus. The prospectuses issued to the public are filed with Bursa Malaysia.

The softcopies of the prospectus were obtained from Bursa Malaysia's website (http://www.bursamalaysia.com/market/listed-companies/initial-public-offerings/ipo-summary); and

(iii) data on industry of the firm is obtained from Bursa Malaysia's website (http://www.bursamalaysia.com/market/listed-companies/initial-public-offerings/ipo-summary).

3.4 Sample Selection

During the research period 2001 to 2011, 157 IPO firms were listed on the Main Board of Bursa Malaysia. Based on the elimination criteria below, 27 firms were excluded from the data sample, thus providing 130 IPOs for inclusion in the research sample. The elimination criteria used is as follows:

3.4.1 Finance Firms and Financial Research Firms

Empirical studies generally exclude several types of IPOs from their samples (Unlu et al., 2004; Arikawa and Imad'eddine, 2010) and this includes firms which are in the financial services and closed end investment funds sectors which are highly regulated by the financial authorities. Firms regulated by the financial authorities have imposed on them stringent risk and operational control, and the shareholders and management do not have the freedom to run their businesses like the firms in other industries do.

3.4.2 Foreign Firms

These are firms which are incorporated and operating in foreign countries and listed on Bursa Malaysia under Chapter 4A of the Bursa Malaysia Listing Requirements. These foreign firms operate in different economies and are governed by the rules of the countries in which they operate. The regulatory requirements imposed on the foreign firms on matters such as taxation, licensing and shareholding structure may be different from those imposed by the Malaysian regulatory authorities.

3.4.3 Infrastructure Companies

These are firms which either have not commenced operations at the point of listing, or firms which have commenced operations and but have not registered any revenue. Since these firms have not commenced operations or have not registered any revenue, it would render it incomparable to the rest of the firms in the sample which have registered revenue and profits.

3.4.4 Special Purpose Acquisition Companies (SPAC)

These are shell firms which are listed under Chapter 6 of the Securities Commission's Equity Guidelines, which at the point of listing do not have operations. The SPAC firms are formed to merge or acquire other operating companies or businesses using proceeds from the IPO. The listing is undertaken based primarily on the track record of the individuals who are promoting the venture. Since these firms do not have operations, it would render it incomparable to the rest of the firms in the sample which registered revenue and profits.

3.4.5 Listings Which Do Not Entail a Public Issue

These are listing of firms which do not entail a public offering. There are two groups of firms which fall into this category. The first category comprises firms which are subsidiaries of firms which are listed on Bursa Malaysia and these subsidiary firms' shares are distributed to existing shareholders of the parent firm. The second category comprises firms which were delisted from the Bursa and subsequently relisted, and does not entail a public offering. These firms do not issue shares to the public and the issue of pricing the shares does not arise.

3.4.6 Incomplete Information on the Firm

This is a firm where the information on all the variables is incomplete.

3.4.7 Outliers

A preliminary test was conducted to detect any outliers in the data by capping the maximum underpricing/overpricing at 100% consistent with the methodology used by Jelic and Briston (1999) and Jog and McConomy (2003). Three IPO firms were excluded from the sample as their underpricing data were above the maximum underpricing.

Based on the elimination criteria, 27 firms were excluded from the sample comprising six finance firms, seven foreign firms, four infrastructure firms, one SPAC firm, five firms which did not undertake a public issue, one firm which does not have complete information on all the variables, and three firms with outliers in the data.

Based on the elimination process, the final sample size was 130 IPO firms

3.5 Sample Size

Roscoe (1975) proposed a few guidelines for determining the sample size: the samples sizes larger than 30 and smaller than 500 are appropriate for most research, and where the sample is divided into sub-samples, a minimum sample size of 30 for each category is required. He also stated that for a simple experimental research with tight experimental controls, small samples of 10 to 20 are sufficient to ensure successful results. The sample size of 130 for this research complies with Roscoe's (1975) guidelines. In addition, all the other sub-samples sizes comply with the guidelines.

3.6 Operational Definitions

The following sections discuss how the dependent and independent variables are operationalized for this research.

3.6.1 Dependent Variable

The dependent variable investigated in this research is underpricing.

3.6.1.1 Underpricing

This research adopts the measure of underpricing generally used in studies on underpricing (Habib and Ljungqvist, 1998; Rosa et al., 2003) to test H1.

$$UP = \frac{(P_c - P_i)}{P_i}$$

where, P_c represents the closing price on the first day of trading and P_i is the offer price of the IPO shares of firm *i*.

An IPO may be priced above the first day closing price, which means the IPO was "overpriced". Hence, where the IPO is overpriced as stated earlier, it will be expressed in a negative value.

3.6.2 Independent Variables

The following section sets out the operational definitions of the fifteen independent variables for this research.

3.6.2.1 Bumiputera Firm

Firms are categorised as Bumiputera firms when 51 % of the firm's equities are owned by Bumiputera shareholders, as defined by the Securities Commission. The percentage of shareholdings held by pre-IPO shareholders is disclosed in the prospectus. There were 33 Bumiputera firms and 97 non-Bumiputera firms in the sample.

3.6.2.2 Age

It is common practice in Malaysia to undertake a restructuring exercise prior to a listing exercise whereby a holding company is incorporated. Under the restructuring exercise, the operating companies will then become the subsidiaries of the holding company. Hence, the age of the firm is determined based on the date of incorporation of the principal operating company to the date of the prospectus. The dates of incorporation are obtained from the prospectus. The age of the firm is measured in years. Ages in months are expressed in fractions of years. Hence, a firm aged six years and three months is expressed as 6.25 years.

The age data is categorised into three groups for data analysis purposes: over 20 years, between 10 and 20 years and below 10 years. There were 46 firms aged above 20 years, 32 firms aged between 10 to 20 years, and 52 firms aged below 10 years in the sample.

3.6.2.3 Size

The size of the firm is based on the audited consolidated total assets of the firm prior to the listing. It is extracted from the prospectus.

The size data is categorised into two groups for data analysis purposes: total assets above RM200 million and total assets below RM200 million. There were 77 firms with total assets above RM200 million and 53 firms with total assets below RM200 million.

3.6.2.4 Industry

The firms in the sample are categorised into eight sectors based on the principal business activity in which they are involved in. The sectors are based on Bursa Malaysia's categorisation of listed firms on the Main Market. Table 3.1 shows the numbers of firms in each of the industry sectors.

Table 3.1

Break-down of the Sample Based on Industry Sectors

Industry	No. of firms
Trading and services	42
Industrial products	31
Property	14
Consumer products	14
Construction	10
Real Estate Investment Trusts	12
Plantation	6
Technology	1
Total	130

Previous studies categorised the sample based on the risk profile and growth potential of the firms (Loughran and Ritter, 2004; Suchard and Woo, 2003). However, the firms in the sample do not fall into the aforementioned categories. An alternative method is used to categorise the sample based on the size of the sub-sample representing each of the industries. The sample is divided into three categories: the first category comprises 42 firms from the trading and services sector, the second category comprises 31 firms from the industrial products sectors, while the third category comprises the remaining 57 firms from the other sectors.

3.6.2.5 Placement Share

Placement shares are the IPO shares which are allocated to certain identified investors as part of the private placement exercise. What is often referred to as placement in other jurisdiction is referred to as private placement in Malaysia. The information whether the IPO entails share placement is disclosed in the prospectus. The proportion of placement shares is expressed as a percentage value. The percentage value is

computed by dividing the number of shares offered as placement against the total IPO shares.

The placement shares data is categorised into two groups for data analysis purposes: placement shares representing more than 50% of the IPO shares, and less than 50% of the IPO shares. There were 47 firms which offered more than 50% of its IPO shares as placement shares and 83 firms which offered less than 50% of its IPO shares as placement shares.

3.6.2.6 Gross Proceeds

The gross proceed is a function of the number of IPO shares offered and the offer price. This methodology follows Carter et al. (1998) and Daily et al. (2003). The number of shares offered and offer price is extracted from the prospectus.

The gross proceeds data is categorised into two groups for data analysis purposes: gross proceeds above RM100 million and gross proceeds below RM100 million. There were 42 firms with gross proceeds above RM100 million and 88 firms with gross proceeds below RM100 million.

3.6.2.7 Listed Firm/Entrepreneur Shareholder

Listed firm/entrepreneur shareholder is the shareholder(s) of a IPO firm comprising (i) firm(s) which is/are already listed on Bursa Malaysia, and/or, (ii) an entrepreneur or entrepreneurs who is/are shareholder(s) of another listed firm on Bursa Malaysia. The information is extracted from the list of shareholders of the IPO firm and the profile of the shareholders disclosed in the prospectus. There were 46 firms in the Listed Firm/Entrepreneur Shareholder category and 84 firms which are not in Listed Firm/Entrepreneur Shareholder category.

3.6.2.8 Secondary Share

Secondary shares are shares held by the pre-IPO shareholder(s) and offered to the investors as part of the IPO. The nature of the shares offered to the public, whether it is a new issue or secondary shares held by the pre-IPO shareholders is disclosed in the prospectus. The secondary share is expressed as a percentage of the total shares offered to the public.

The secondary shares data is categorised into three groups for data analysis purposes: secondary shares above 37.15%, between 0% and 37.15% and at 0%. There were 61 firms which offered secondary shares representing more than 37.15% of its total IPO shares, 33 firms which offered secondary shares representing between 0% to 37.15% of their total IPO shares and 36 firms which did not offer any secondary shares as part of its IPO shares.

3.6.2.9 Offer Price

The offer price of the IPO is disclosed in the prospectus. The offer price variable is expressed in Ringgit value.

The offer price data is categorised into two groups for data analysis purposes: offer price above RM1.00 and below RM1.00. There were 83 firms with offer price above RM1.00 and 47 firms with offer price below RM1.00.

3.6.2.10 Investment Bank Reputation

The name of the investment bank advising the IPO is disclosed in the prospectus. The reputation of the investment bank is based on the relative market share of each of the investment bank. Table 3.2 shows the number of IPOs advised by each investment bank.

The investment bank reputation is ranked based on the relative market share of each of the investment bank during the research period. The relative market share is determined by totalling the number of IPOs an investment bank is involved in as an advisor and then dividing the figure by the total IPOs during the research period in accordance with the methodology used by Megginson and Weiss (1991), Ritter (2003) and Suchard and Singh (2007).

Based on the above criteria, AmInvestment Bank Berhad and CIMB Investment Bank Berhad are ranked as first and second in the rankings of the investment banks reputation.

The investment bank data is categorised into two groups for data analysis purposes: the first category comprises 70 IPO firms of which 37 IPO firms were advised by AmInvestment Bank Berhad and 33 firms which were advised by CIMB Investment Bank Berhad, while the secondary category comprises 60 firms which were advised by the other investment banks.

3.6.2.11 Auditor Reputation

Based on the Securities Commission's Audit Oversight Board 2010 Annual Report, the Big Four together with two others firms with more than 10 partners audited 73% of the listed firms in Malaysia which represented 93% of the total market capitalisation of the firms on Bursa Malaysia. The Big Four group comprises Deloitte & Touche, Ernst & Young, KPMG and PricewaterhouseCoopers. Arthur Andersen Malaysia (which was in the Big Six group earlier) merged with Ernst & Young and is included as part of the Big Four group in this research. There were 90 firms audited by the Big Four and 40 firms audited by the non-Big Four firms in the sample.

Table 3.2

Break-down of Sample based on Investment Bank Categories

Investment Bank	**No. of IPO firms**
AmInvestment Bank Berhad	37
CIMB Investment Bank Berhad	34
Maybank Investment Bank Berhad	16
MIMB Investment Bank Berhad	12
RHB Investment Bank Berhad	11
OSK Investment Bank Berhad	6
Alliance Investment Bank Berhad	4
Southern Investment Bank Berhad	3
ECM Libra Securities Sdn Bhd	2
Bank Islam Malaysia Berhad	2
Kenanga Investment Bank Berhad	1
Hwang-DBS Investment Bank Berhad	1
Public Investment Bank Berhad	1
Total	**130**

3.6.2.12 Retained Shareholding

Retained shareholding is the shareholdings held by the pre-IPO shareholders after the IPO. The proportion of shareholdings to be retained by the pre-IPO shareholders in the post-IPO firm is disclosed in the prospectus. The retained shareholdings is expressed in percentage form. The mean retained shareholding for the period was 65.20% (*SD*= 9.90).

The retained shareholding data is categorised into two groups for data analysis purposes: retained shareholding above the mean retained shareholding and below the mean retained shareholding. There were 79 firms with retained shareholding above the

mean retained shareholding and 51 firms with retained shareholding below the mean retained shareholding.

3.6.2.13 Subscription Rate

The subscription rate is the rate at which the IPO shares offered to investors is subscribed. The subscription rate of the IPOs in the sample is obtained from Bursa Malaysia's database. The subscription rate is expressed in multiples (times). The mean subscription rate for the period was 14.82 times (*SD*= 18.10).

The subscription rate data is categorised into two groups for data analysis purposes: subscription rate above the mean subscription rate, and below the mean subscription rate. There were 61 firms with subscription rate above the mean subscription rate and 69 firms with subscription rate below the mean subscription rate.

3.6.2.14 Stock Market Performance

The stock market performance was measured based on the performance of the FTSE Bursa Malaysia Kuala Lumpur Composite Index (KLCI), the index tracking the performance of 30 largest capitalised companies on Bursa Malaysia.
The stock market performance variable is constructed based on the percentage difference between the KLCI on the day of the issuance of the prospectus and the KLCI on the day of the listing of the firm. The KLCI indices were is obtained from Bursa Malaysia's database. The stock market performance (KLCI) is expressed in percentage form.

The KLCI data is categorised into two groups for data analysis purposes: KLCI change above 1% and below 1%. There were 63 firms with KLCI change above 1% and 67 firms with KLCI change below 1%.

3.7 Analysis of Data

This section sets out the statistical methods used to analyse the data and answer the research questions.

3.7.1 Descriptive Statistics

Descriptive statistics such as the mean, standard deviation, skewness and kurtosis are first conducted on the data. Descriptive statistics is used to answer RQ1 and to test H1 on underpricing and the trend of underpricing during the study period.

3.7.2 Spearman Rho Correlation Test

Spearman rho is a bivariate statistical methodology for measuring the monotonic relationship between two variables. It is a nonparametric measure that avoids assumptions that the variables have a straight line relationship. It does not require normality in the data distribution and it can be used when one variable is an interval/ratio and the other is an ordinal.

Spearman rho correlation tests has been used in a number of previous corporate finance research to study the relationship between variables: underpricing of IPOs (Deng and Dorfleitner, 2008), corporate governance and firm value (Garay and Gonzalez, 2008), impact of mergers and acquisitions on corporate performance (Kumar and Bansal, 2008) and corporate financial reporting (McNally et al., 1982). Spearman rho is used to answer RQ2 and to test H2 to H15 on the correlation between underpricing and the independent variables.

3.8 Limitations of the Research

The sample comprises 130 IPOs on the Main Market, which is relatively a small sample size. As such, the data used in the analysis and results of the research may not represent underpricing in the overall Bursa Malaysia.

On 3 August 2009, what was then referred to as the Main Board of Bursa Malaysia was renamed the Main Market. The Second Board of the Bursa Malaysia was abolished on the same date and all the firms listed on the Second Board were transferred to the Main Market. The qualification criteria for listing on the Main Market were also revised. The minimum profit after-tax for a three-to-five year financial period was reduced from RM30 million to RM20 million, while the after-tax profit for the latest financial period was reduced from RM8 million to RM6 million. The Second Board had a lower quantitative criteria with a lower minimum after-tax requirement of RM12 million for a three-to-five year financial period and RM4 million for the latest financial year.

Based on the lower quantitative criteria, the quality of the firms listed in 2010 and 2011 may not be the same as those IPOs prior to 3 August 2009. Hence, investor's perception and valuation of firms listed subsequent to 3 August 2009 may not be the same as firms listed on the Main Board prior to 2009, and may have influenced the level of underpricing.

The Asian financial crisis which erupted in the middle of 1997 had a major impact on the Malaysian economy and capital market and the after-shocks were observed even in the first-half of 2000 (Wing, 2000). Another economic and financial crisis occurred in 2008 and 2009 following which the global stock markets declined significantly. Both crisis would have had damaged investor confidence and valuation of securities.

The small sample size, the revisions to the qualification criteria for listing on the Main Board on 3 August 2009 and the two financial crises in 1997 and 2008/2009 limits the generalizability of the findings of this research as the data used for analysis and the results generated may not represent normal market conditions.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of this empirical research. The results presented are based on general descriptive statistics and Spearman rho correlation tests. The results of this research are then compared with previous studies.

4.2 Descriptive Statistics

The descriptive statistics of all the variables are set out in this section.

4.2.1 Underpricing

Table 4.1 shows the mean underpricing of the sample (*N*=130) for the study period 2001 to 2011, and for each of the years. Figure 4.1 depicts the distribution of the underpricing during the study period.

The mean underpricing for the study period is 12.15% (*SD* = 20.67%). Analysis of the distribution shows that the data are skewed (Skewness = 1.33, Kurtosis = 2.48). This suggests the non-normality in the data distribution.

Year 2003 recorded the highest mean underpricing of 27.35% (SD = 20.23) during the study period. The IPOs were overpriced by 5.97% (SD = 14.86%) in 2001 and 8.95% (SD = 14.89%) in 2008. The number of IPOs were the lowest in 2001 and 2008, the years which recorded overpricing. The descriptive statistics shows that there is no obvious trend in underpricing during the study period, as shown in Figure 4.2.

Table 4.1

Mean Underpricing by Period and Year

Period/Year	*N*	*Mean*	*Standard deviation*	*25th Percentile*	*Median*	*75th Percentile*
		%	%	%	%	%
2001-2011*	130	12.15	20.67	-0.31	6.98	19.83
2001	5	-5.97	14.86	-14.35	-2.79	2.83
2002	19	7.84	14.49	1.13	8.00	16.01
2003	13	27.35	20.23	12.56	26.88	43.13
2004	14	24.13	25.36	1.20	18.42	32.00
2005	11	5.14	12.39	-0.62	2.00	6.74
2006	8	12.23	20.37	-0.48	5.84	14.47
2007	13	22.15	21.44	12.22	16.67	22.21
2008	5	-8.95	14.89	-18.13	-12.80	5.67
2009	8	6.43	12.61	-4.17	5.34	15.64
2010	20	2.39	8.69	-2.37	.96	4.38
2011	14	19.36	27.51	3.00	11.50	34.00

** Skewness = 1.33, Kurtosis = 2.48*

Table 4.2

Descriptive Statistics of the Independent Variables (N=130)

Independent Variable	*Mean*	*Standard deviation*	*Skewness*	*Kurtosis*	*25th percentage*	*Median*	*75th percentage*
Bumiputera firm (%)	38.13	93.50	8.60	87.94	-	15.50	53.87
Age (Years)	17.65	10.24	1.53	3.34	10.31	14.79	21.87
Size (RM'million)	850.83	2,638.37	6.87	52.01	132.778	243.684	464.162
Placement share (%)	37.56	29.22	0.31	-1.05	10.32	33.17	60.43
Gross proceeds (RM'million)	424.71	1,539.96	6.91	50.91	30.23	59.31	197.54
Secondary share (%)	37.15	33.52	0.45	-1.00	0.00	31.07	64.06
Offer price (RM)	1.43	0.89	1.98	4.60	0.90	1.20	1.68
Retained share (%)	65.20	9.90	-1.21	0.98	60.55	68.44	73.52
Subscription rate (times)	14.82	18.10	2.12	4.99	2.67	7.78	18.64
KLCI (%)	0.73	4.56	-1.65	5.91	-0.94	0.90	3.29

Figure 4.1

Histogram of Underpricing for the Study Period 2001 to 2011 (N=130)

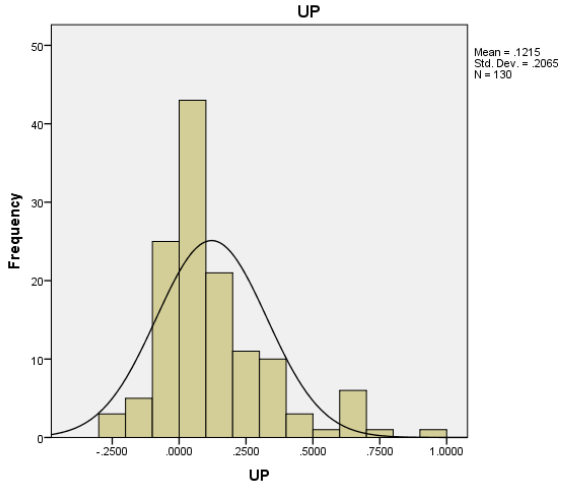
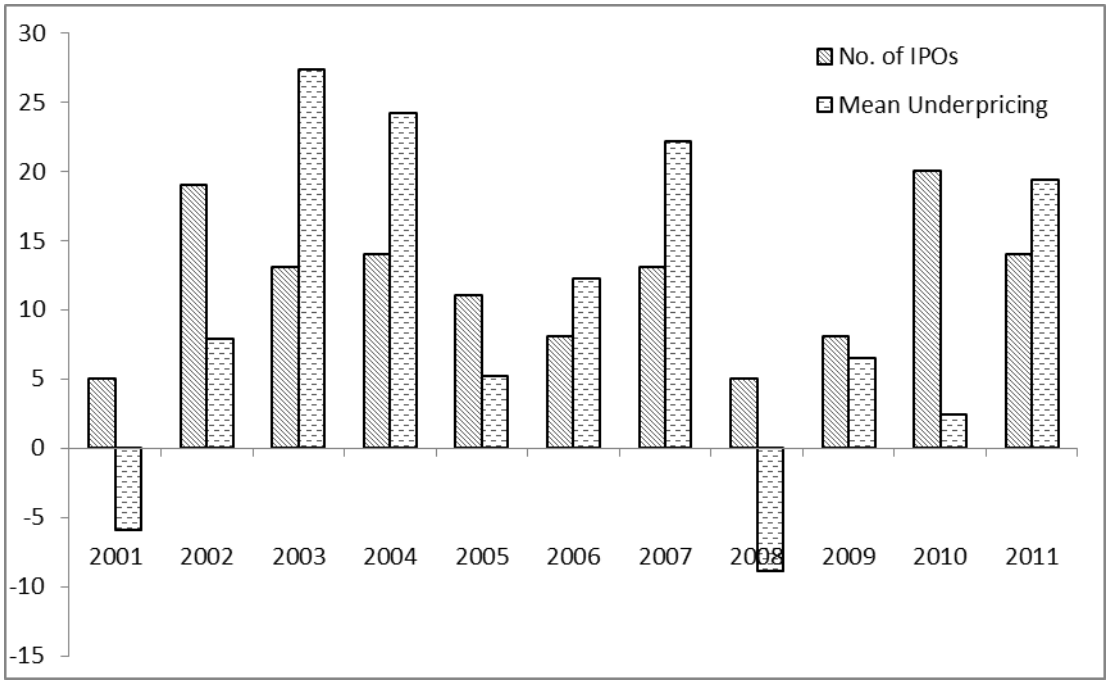


Figure 4.2

Yearly Number of IPOs (2001 to 2011) and the Mean Underpricing in the Respective Years

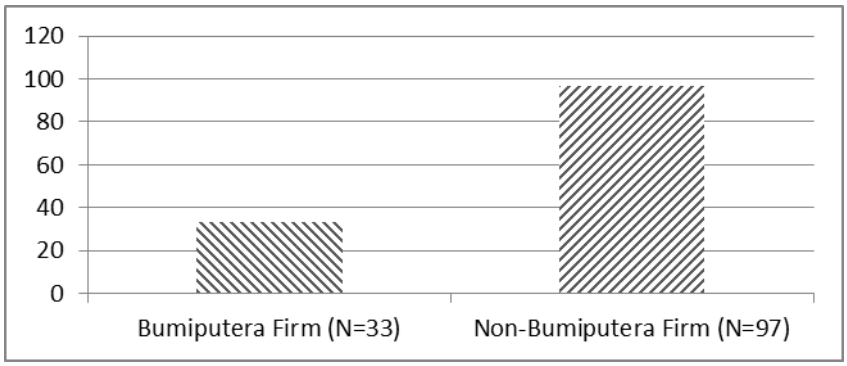


4.2.2 Bumiputera Firm

Table 4.2 shows that the mean Bumiputera shareholdings for the study period 2001 to 2011. The mean Bumiputera shareholding of the sample is 38.13% (*SD* = 93.50%). Analysis of the distribution shows that the data are skewed (Skewness = 8.60, Kurtosis = 87.94). This suggests non-normality in the data distribution. This research categorised the IPO firms into Bumiputera firms and non-Bumiputera firms. Firms are categorised as Bumiputera firms when 51 % of the firm's shares are held by Bumiputera shareholders, as defined by the Securities Commission. There were 33 Bumiputera firms and 97 non-Bumiputera firms in the sample. The Bumiputera shareholding variable is tested as a nominal variable. Figure 4.3 shows the break-down of the sample based on Bumiputera firms and non-Bumiputera firms.

Figure 4.3

Bar Chart of the Bumiputera Firms and Non-Bumiputera Firms (N=130)



4.2.3 Age

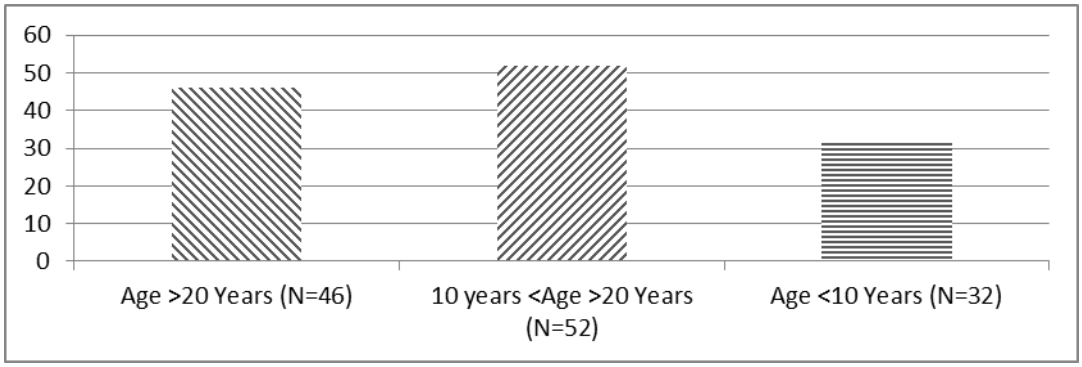
Table 4.2 shows that the mean age of the IPO firms in the sample. The mean age of the IPO firms of the sample is 17.65 years (*SD* = 10.24). Analysis of the distribution shows that the data are skewed (Skewness = 1.53, Kurtosis = 3.34). This suggests non-normality in the data distribution.

The age data is categorised into three groups for data analysis purposes: over 20 years, between 10 and 20 years and below 10 years. There were 46 firms aged above 20 years,

52 firms aged between 10 to 20 years, and 32 firms aged below 10 years in the sample. The age variable is tested as an ordinal variable. Figure 4.4 shows the break-down of the sample based on the age groups of the IPO firms in the sample.

Figure 4.4

Bar Chart of the Age Categories of the Sample (N=130)



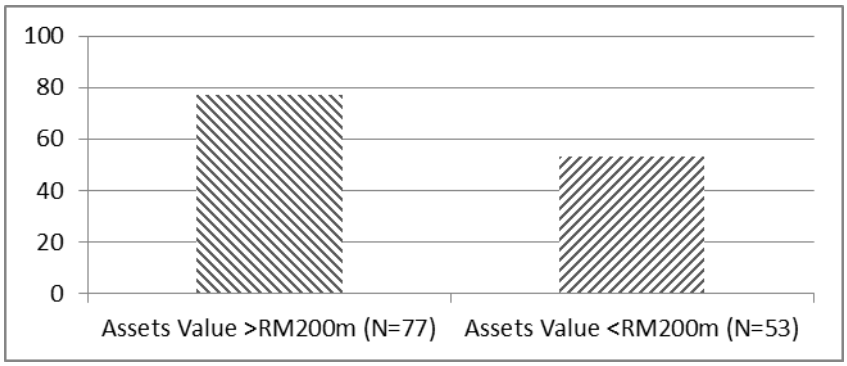
4.2.4 Size

Table 4.2 shows that the mean size of the IPO firms in the sample. The mean size of the IPO firms of the sample is RM850.83 million (*SD* = 2638.37). Analysis of the distribution shows that the data are skewed (Skewness = 6.87, Kurtosis = 52.01). This suggests non-normality in the data distribution.

The IPO firms in the sample are divided into two categories; the first category comprises 77 firms with total assets above RM200 million and the second category comprises 53 firms with total assets below RM200 million. The size variable is tested as an ordinal variable. Figure 4.5 shows the break-down of the sample based on the size of the IPO firms in the sample.

Figure 4.5

Bar Chart of the Size Categories of the Sample (N=130)

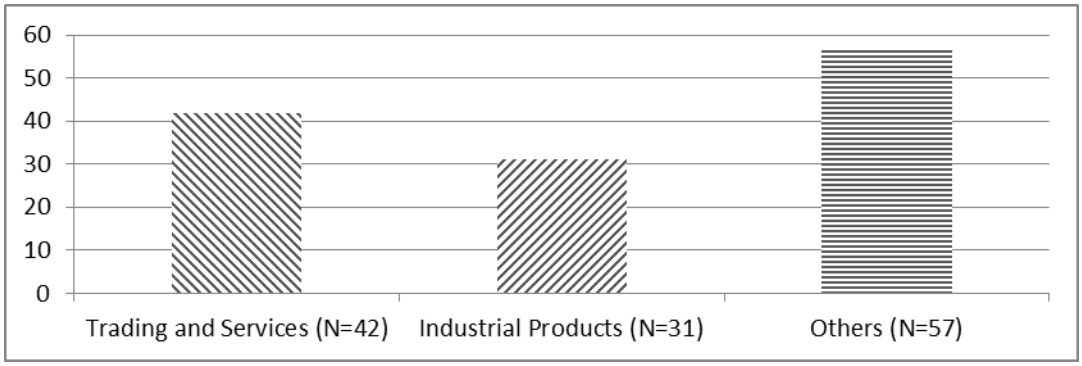


4.2.5. Industry

The IPO firms in the sample are divided into eight sectors based on Bursa Malaysia's categorisation of the firms on the Main Board. The sample is divided into three categories: the first category comprises 42 firms from the trading and services sector, the second category comprises 31 firms from the industrial products sectors, while the third category comprises the remaining 57 firms from the other sectors. The industry variable is tested as an ordinal variable. Figure 4.6 shows the break-down of sample based on industry categories.

Figure 4.6

Bar Chart of the Industry Categories of the Sample (N=130)



4.2.6 Placement Share

Table 4.2 shows that the mean size of the IPO firms in the sample. The mean size of the placement share of the IPO firms of the sample is 37.56% (*SD* = 29.22%). Analysis of the distribution shows that the data are almost normally distributed (Skewness = 0.31, Kurtosis = -1.05).

The placement share data is categorised into two groups for data analysis purposes: placement shares representing more than 50% of the IPO shares, and less than 50% of the IPO shares. There were 47 firms which offered more than 50% of its IPO shares as placement shares and 83 firms which offered less than 50% of its IPO shares as placement shares. The placement share variable is tested as an ordinal variable. Figure 4.7 shows the break-down of sample based on placement share categories.

Figure 4.7

Bar Chart of the Placement Share Categories of the Sample (N=130)

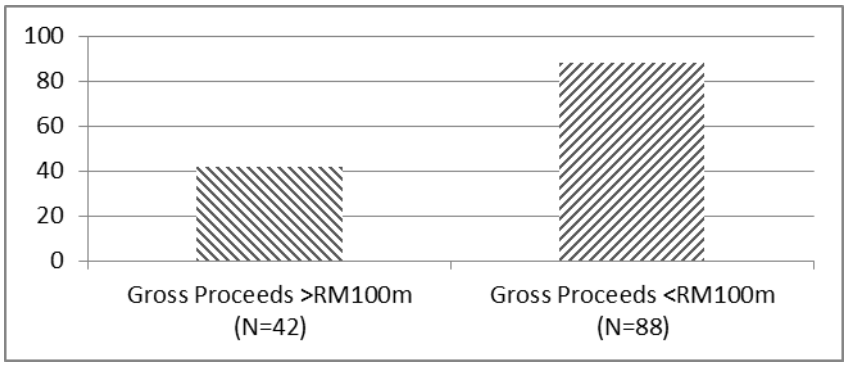
4.2.7 Gross Proceeds

Table 4.2 shows that the mean gross proceeds of the IPO firms in the sample. The mean age of the IPO firms of the sample is RM424.71 million (SD = 1,539.96). Analysis of the distribution shows that the data are skewed (Skewness = 6.91, Kurtosis = 50.91). This suggests non-normality in the data distribution.

The IPO firms in the sample are divided into two categories; the first category comprises 42 firms with proceeds above RM100 million, while the second category comprises the remaining 88 firms with gross proceeds below RM100 million. The gross proceeds variable is tested as an ordinal variable. Figure 4.8 shows the break-down of sample based on gross proceeds categories.

Figure 4.8

Bar Chart of the Gross Proceeds Categories of the Sample (N=130)

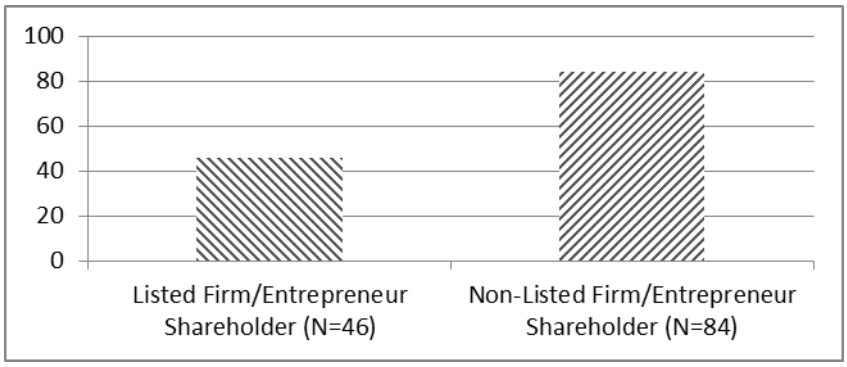


4.2.8 Listed Firm/Entrepreneur Shareholder

The IPO firms in the sample are divided into two categories; the first category comprises 46 firms in the listed firm/entrepreneur shareholder category and the second category comprises 84 firms which are not in the listed firm/entrepreneur shareholder category. The listed firm/entrepreneur shareholder variable is tested as a nominal variable. Figure 4.9 shows the break-down of sample based on listed firm/entrepreneur shareholder and listed firm/entrepreneur shareholder categories.

Figure 4.9

Bar Chart of the Listed Firm/Entrepreneur Shareholder Categories of the Sample (N=130)



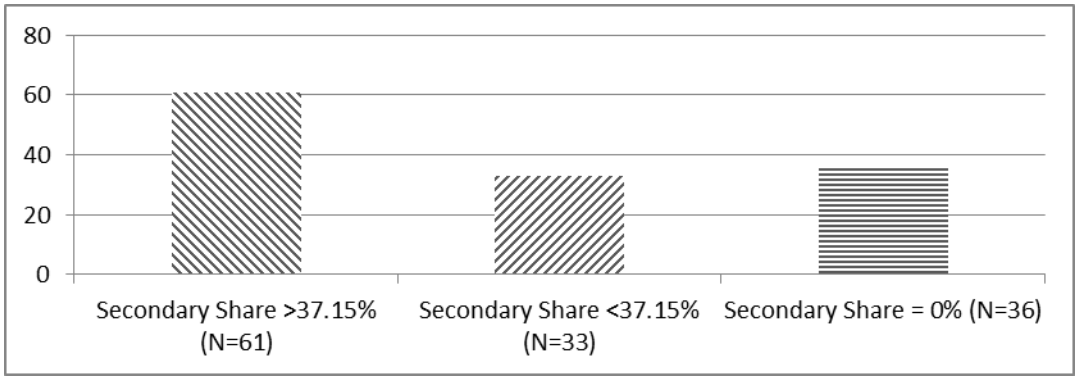
4.2.9 Secondary Share

Table 4.2 shows that the mean secondary share offered by the IPO firms in the sample. The mean secondary share offered by the IPO firms in the sample is 37.15% (*SD* = 33.52%). Analysis of the distribution shows that the data are normally distributed (Skewness = 0.45, Kurtosis = -1.00).

The secondary share data is categorised into three groups for data analysis purposes: secondary shares above 37.14%, between 0% and 37.15% and at 0%. There were 61 firms which offered secondary share representing more than 37.15% of its total IPO shares, 33 firms which offered secondary shares representing between 0% to 37.15% of their total IPO shares and 36 firms which did not offer any secondary share as part of its IPO shares. Figure 4.10 shows the break-down of sample based on secondary share categories.

Figure 4.10

Bar Chart of the Secondary Share Categories of the Sample (N=130)



4.2.10 Offer Price

Table 4.2 shows the mean offer price of the IPO firms in the sample. The mean offer price of the IPO firms in the sample is RM1.43 (*SD* = RM0.89). Analysis of the distribution shows that the data are skewed (Skewness = 1.98, Kurtosis = 4.60). This suggests the non-normality of the data distribution.

The offer price data is categorised into two groups for data analysis purposes: offer price above RM1.00 and below RM1.00. There were 83 firms with offer price above RM1.00 and 47 firms with offer price below RM1.00. Figure 4.11 shows the break-down of sample based on offer price categories.

Figure 4.11

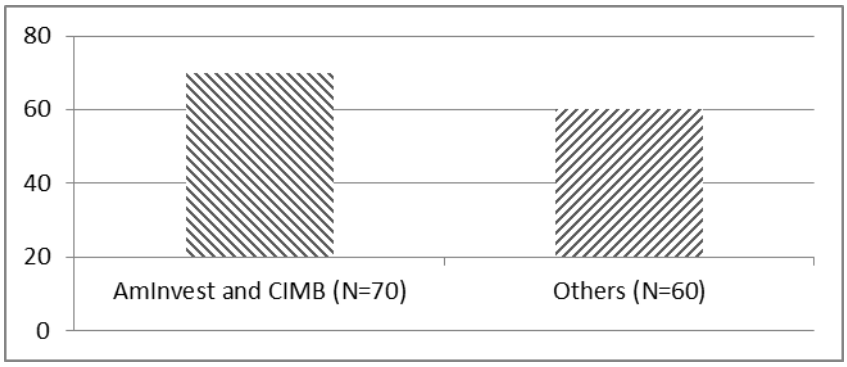
Bar Chart of the Offer Price Categories of the Sample (N=130)

4.2.11 Investment Bank Reputation

The IPO firms in the sample are divided into two categories: the first category comprises 70 IPO firms of which 37 IPO firms were advised by AmInvestment Bank Berhad and 33 firms which were advised by CIMB Investment Bank Berhad, while the second category comprises 60 firms which were advised by the other investment banks. The investment bank variable is tested as a nominal variable. Figure 4.12 shows the break-down of sample based on investment bank categories.

Figure 4.12

Bar Chart of the Investment Bank Categories of the Sample (N=130)

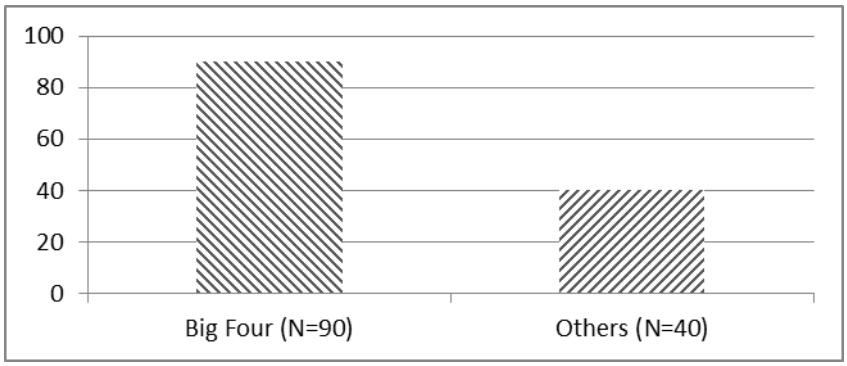


4.2.12. Auditor Reputation

The IPO firms in the sample are divided into two categories: the first category comprises 90 firms which were audited by the Big Four audit firms while the second category comprises 40 firms which were audited by the non-Big Four firm. The auditor variable is tested as a nominal variable. Figure 4.13 shows the break-down of sample based on auditor categories.

Figure 4.13

Bar Chart of the Auditor Categories of the Sample (N=130)



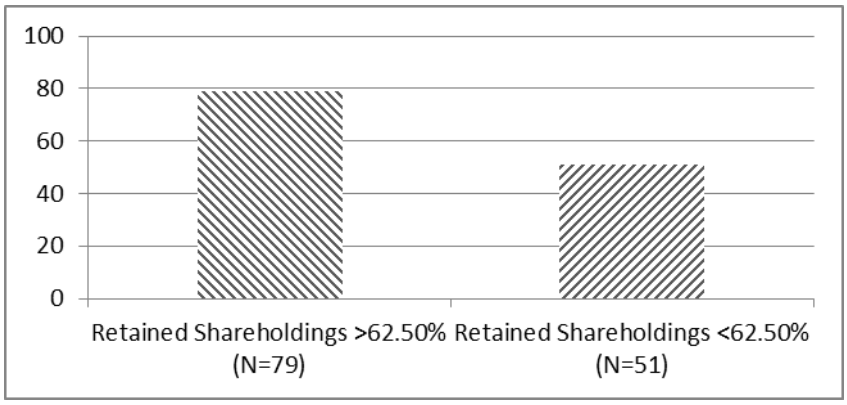
4.2.13 Retained Shareholding

Table 4.2 shows the mean retained shareholding held in the IPO firms in the sample. The mean retained shareholding held in the IPO firms in the sample is 65.20% (*SD* = 9.90%). Analysis of the distribution shows that the data are normally distributed (Skewness = -1.21, Kurtosis = 0.98). This suggests the normality of the data distribution.

The retained shareholding data is categorised into two groups for data analysis purposes: retained shareholding above the mean retained shareholding and below the mean retained shareholding. There were 79 firms with retained shareholding above the mean retained shareholding and 51 firms with retained shareholding below the mean retained shareholding. The retained shareholding variable is tested as a nominal variable. Figure 4.14 shows the break-down of sample based on retained shareholding categories.

Figure 4.2.14

Bar Chart of the Retained Shareholding Categories of the Sample (N=130)



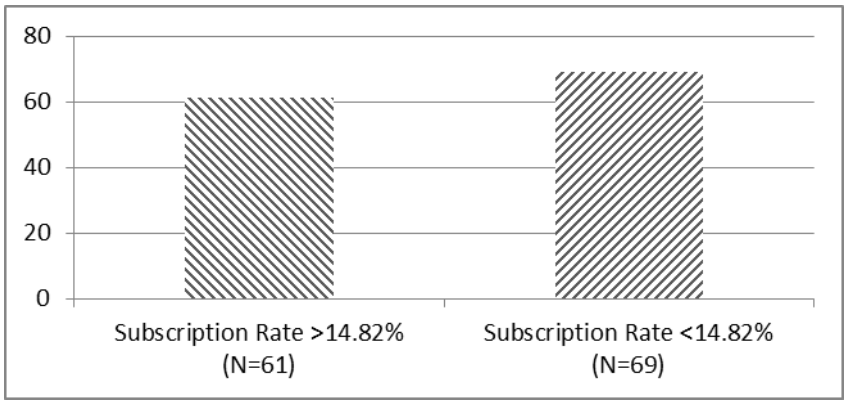
4.2.14 Subscription Rate

Table 4.2 shows the mean subscription rate of the IPO firms in the sample. The mean gross subscription rate of the IPO firms in the sample is 14.82 times (*SD* = 18.10 times). Analysis of the distribution shows that the data are skewed (Skewness = 2.12, Kurtosis = 4.99). This suggests the non-normality of the data distribution.

The subscription rate data is categorised into two groups for data analysis purposes: subscription rate above the mean subscription rate, and below the mean subscription rate. There were 61 firms with subscription rate above the mean subscription rate and 69 firms with subscription rate below the mean subscription rate. The subscription rate variable is tested as an ordinal variable. Figure 4.15 shows the break-down of sample based on the subscription rate categories.

Figure 4.15

Bar Chart of the Subscription Rate Categories of the Sample (N=130)



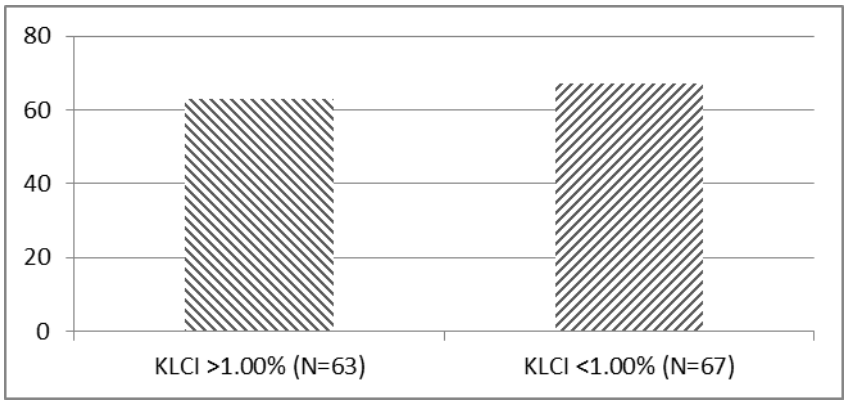
4.2.15 Stock Market Performance

Table 4.2 shows the mean change in KLCI of the IPO firms in the sample. The mean KLCI change of the IPO firms in the sample is 0.73% (*SD* = 4.56%). Analysis of the distribution shows that the data are negatively skewed (Skewness = -1.65, Kurtosis = 5.91). This suggests the non-normality of the data distribution.

The KLCI data is categorised into two groups for data analysis purposes: KLCI change above 1% and below 1%. There were 63 firms with KLCI change above 1% and 67 firms with KLCI change below 1%. The KLCI variable is tested as an ordinal variable. Figure 4.2.16 shows the break-down of sample based on the KLCI categories.

Figure 4.16

Bar Chart of the KLCI Categories of the Sample (N=130)



4.3 Hypotheses Testing and Results

This section presents and discusses the results of the tests of each of the 15 hypotheses formulated in this research. H1 which is related to RQ1 is tested through the results of the descriptive statistics. H2 to H15 which are related to RQ2 are tested through Spearman rho correlation tests. The data were analysed using a .05 level of significance for Spearman rho correlation tests.

4.3.1 Underpricing

Hypothesis H1a states that IPOs during the research period 2001 and 2011 were underpriced. The descriptive statistics show that the mean underpricing during the study period is 12.15% (*SD* = 20.67%). Therefore, H1a is accepted.

Hypothesis H1b states that the level of underpricing is in a decreasing trend over the research period 2001 and 2011. The descriptive statistics results show that there is no observable trend in underpricing over the study period. Therefore, H1b is rejected.

On a year to year basis, the mean underpricing was the highest in 2003 at 27.35% (*SD* = 20.23). The IPOs in the sample were overpriced by 5.97% (*SD* = 14.86%) in 2001 and

8.95% (*SD* = 14.89%) in 2008. The two years when the IPOs were overpriced, being 2001 and 2008 were also the years when the number of IPOs were the lowest in the sample. Abdul-Rahim and Yong (2010) observed underpricing declining substantially from 94.91% reported from the pre-crisis period of 1990-1998 to 31.99% in post-rises period 1999-2007. Wing (2000) observed that the after-shocks of the Asian financial crisis which occurred in 1997 was observed even in the first-half of 2000. The global stock markets declined significantly following the economic and financial crisis which occurred in 2008 and 2009. Investor confidence was damaged resulting in lower valuation of securities following the first crisis on the IPOs in 2001 and the second crisis on the IPOs in 2008. The lower valuation resulted in smaller difference between the issue price and closing price and therefore lower underpricing. The low number of IPO in 2001 and 2008 also explains that the owners of potential IPO firms were delaying their IPOs and this evidenced in the significant increase in the number of IPOs in the subsequent years, that is 2002 and 2009 respectively.

4.3.2 Bumiputera Firm

Hypothesis H2 states that underpricing is not related to whether the firm is a Bumiputera firm or non-Bumiputera firm. The data analysis using Spearman rho correlation tests results in a coefficient of -.010 with a *p*-value of .457. Based on the results, there is no correlation between underpricing and Bumiputera firm. Therefore, H2 is supported.

The operation of market microstructure has been observed in other markets in other research such Chen et al. (2000), Hensler et al. (2000) and Nandha and Sawyer (2002) where the market distinguishes micro-factors which influences certain variables. However, the result of this research shows that investors do not differentiate between Bumiputera firms and non-Bumiputera firms in making their investment decisions. The listing criteria set by the Securities Commission applies to all IPO firms regardless of whether the firms are Bumiputera controlled or not. Hence, once a firm is approved for listing by the Securities Commission, it may be perceived that the qualities of the firms, Bumiputera and non-Bumiputera, have met the minimum quantitative and qualitative

criteria. Therefore, whether an IPO firm is a Bumiputera firm or a non-Bumiputera firm is not a criterion which investors look out for. Therefore, there is no correlation between underpricing and Bumiputera firm.

4.3.3 Age

Hypothesis H3 states that underpricing is negatively related to the age of the firm. The data analysis using Spearman rho correlation tests results in a coefficient of .077 with a *p*-value of .193. Based on the results, there is no correlation between underpricing and age of the firm. Therefore, H3 is rejected.

Previous research have found significant positive relationship between age of the firm and underpricing (Megginson and Weiss, 1991; Muscarella and Vetsuypens, 1989; Ritter, 1998; Loughran and Ritter, 2004), premised on the hypothesis that the larger the size of the firm, the greater its ability to access resources to remain viable and profitable. On the hand Cassia et al. (2004) found older firms produces lower underpricing, premised on the hypothesis that older firms are associated with less uncertainty and information asymmetry. The results of this research shows that investment decisions related to IPO firms are not influenced by the age of the firm. This may be because investors perceive that past performance may not necessarily reflect future performance and profitability. The ability to access resources such as finance is determined by the future prospects and cash flow of the firm and not past performance. Further, older firms may not necessarily be ready or flexible to adapt to changing industry dynamics, technological innovations and market demands. The information asymmetry gap perceived to exist amongst investors with younger firms is narrowed with the issuance of a standard prospectus governed by the minimum disclosure requirements set by the Securities Commission. Therefore, there is no correlation between underpricing and age of the firm.

4.3.4 Size

Hypothesis H4 states that underpricing is negatively related to the size of the firm. The data analysis using Spearman rho correlation tests results in a coefficient of .133 with a *p*-value of .066. Based on the results, there is no correlation between underpricing and size of the firm. Therefore, H4 is rejected.

Previous research has found a significant negative relationship between firm size and underpricing (Carter et al., 1998; Ibbotson et al., 1988; Ibbotson et al., 1994; Megginson and Weiss, 1991). The results of this research shows that investment decisions related to IPO firms are not influenced by the size of the firm. This may be so because investors perceive that size may not necessarily reflect future performance and profitability. The ability to access resources such as finance is determined by the future cash flows of the firm and not size of the firm. Further, large firms may not necessarily be ready or flexible to adapt to technological innovations and market demands. The information asymmetry gap perceived to exist amongst investors with smaller firms is narrowed with the issuance of a standard prospectus governed by the minimum disclosure requirements set by the Securities Commission. Therefore, there is no correlation between underpricing and size of the firm.

4.3.5 Industry

Hypothesis H5 states that underpricing is not related to the industry of the IPO firm. The data analysis using Spearman rho correlation results tests in a coefficient of .074 with a *p*-value of .202. Based on the results, there is no correlation between underpricing and industry of the firm. Therefore, H5 is accepted.

Previous research has found a significant positive relationship between industry and underpricing (Loughran and Ritter, 2004; Suchard and Woo, 2003), and their explanation is primarily based on the industry profile of the IPO firms: growth industries and high risk industries.

IPO firms involved in the growth industries will have better prospects and earnings growth potential compared to firms in mature industries. Investors will give higher valuation to firms in the growth industries and therefore will experience higher underpricing. On the other hand, firms which are involved in the high risk industries will be given lower valuations. Hence, underpricing of firms which are involved in the riskier industries will be higher compared to firms which are involved in the low risk businesses. The eight sectors in which the IPO firms in the sample are involved in (namely, trading and services, industrial products, property, consumer products, construction, real estate investment trusts, plantation and technology) cannot be categorised as growth industries or risky industries, save for one firm from the technology sector. Therefore, high underpricing observed in IPO firms from growth and risky industries are not observed in this research. Therefore, industry of the firm does not result in higher underpricing.

4.3.6 Placement Share

Hypothesis H6 states that underpricing is positively related to the proportion of the placement share. The data analysis using Spearman rho correlation tests results in a coefficient of .230 with a *p*-value of .004. Based on the results, there is a weak positive correlation between underpricing and placement share. Therefore, H6 is accepted.

When IPO firms reserve proportionately large number of shares for placement compared to the number of shares offered to retail investors, there will be high demand for the shares on the first day of trading from retail investors who were not allotted the shares through the balloting. The high demand will translate into high first day trading price. Hence, the high proportion of placement shares will result in high underpricing. Therefore, higher placement share result in higher underpricing.

4.3.7 Gross Proceeds

Hypothesis H7 states that underpricing is negatively related to the IPO gross proceeds. The data analysis using Spearman rho correlation tests results in a coefficient of -.008 with a *p*-value of .464. Based on the results, there is no correlation between underpricing and gross proceeds. Therefore, H7 is rejected.

The result is inconsistent with previous research which found high gross proceeds are undertaken by large established firms which are perceived to be less risky and therefore derive lower underpricing (Carter et al., 1998). Tinic (1988) on the hand argues that small issues are offered by small firms which are speculative in nature while larger offerings are associated with seasoned large firms. The utilisations of the gross proceeds are approved by the Securities Commission and are disclosed in the prospectus. Investors may perceive that the objective of the gross proceeds is to fulfil the IPO firm's capital requirement and to expand its business capacity and capability. Also, investors may not necessarily perceive gross proceeds as a reflection of the riskiness of the IPO firm as an investment nor are the shares of the IPO firm's shares subject to speculation. Therefore, there is no correlation between underpricing and size of the firm. Therefore, higher gross proceed does not result in higher underpricing.

4.3.8 Listed Firm/Entrepreneur Shareholder

Hypothesis H8 states that underpricing is negatively related to the existence of a listed firm/entrepreneur shareholder. The data analysis using Spearman rho correlation tests results in a coefficient of .016 with a *p*-value of .428. Based on the results, there is no correlation between underpricing and listed firm/entrepreneur shareholder. Therefore, H8 is rejected.

This is inconsistent with previous research which suggests that information asymmetries and uncertainty would be reduced where the holding firm of the IPO firm is already listed (Baron, 1982). The Bursa Malaysia regulations does not allow a firm owned by a shareholder who also owns another listed firm involved in the same business to be listed

on Bursa Malaysia. This is to ensure conflicts of interest do not arise in running the two separate firms. As such, while the listed firm/entrepreneur shareholder will be able to replicate some of the business strategies as well as governance and controls in the new IPO firm, the new IPO firm will have its own risk profiles and subject to its own industry/business dynamics. The new IPO firm may require a different set of management skills which the listed firm/entrepreneur shareholder may not possess. Therefore, investors do not ascribe additional value to a firm if it has a listed firm/entrepreneur shareholder, and does not result in higher underpricing. Therefore, having a listed firm/entrepreneur shareholder does not result in higher underpricing.

4.3.9 Secondary Share

Hypothesis H9 states that underpricing is negatively related to proportion of secondary shares on sale. The data analysis using Spearman rho correlation tests results in a coefficient of -.192 with a *p*-value of .014. Based on the results, there is a weak negative correlation between underpricing and secondary share. Therefore, H9 is accepted.

The result is consistent with previous research which found a significant negative relationship between underpricing and secondary share (Carter and Manaster, 1990; Brennan and Franks, 1997). When pre-IPO shareholders' offer the shares they already own to investors, they will experience higher losses as a result of their offer for sale resulting from dilution compared to retaining their shares. As such the pre-IPO shareholders are more likely to minimise the underpricing to ensure the effect on their own wealth is low. Therefore, higher secondary share does not result in higher underpricing.

4.3.10 Offer Price

Hypothesis H10 states that underpricing is negatively related to the offer price. The data analysis using Spearman rho correlation tests results in a coefficient of .040 with a

p-value of .324. Based on the results, there is no correlation between underpricing and offer price. Therefore, H10 is rejected.

The result is inconsistent with previous research which found a significant negative relationship between offer price and underpricing (Brennan and Hughes, 1991; Beatty and Welch, 1996; Ibbotson et al., 1988). The offer price is set after taking into account the firms asset value as well as its prospects. Further, the managers of the IPO firm and its investment bank will set the offer price after bench marking the IPO firm against similar firms listed on Bursa Malaysia. Hence, investors may not perceive the offer price as a signal of quality or future prospects but as the true value of the IPO shares. Therefore, higher offer price does not result in higher underpricing.

4.3.11 Investment Bank Reputation

Hypothesis 11 states that underpricing is negatively related to the reputation of the investment bank advising the IPO firm. The data analysis using Spearman rho correlation tests results in a coefficient of .009 with a *p*-value of .461. Based on the results, there is no correlation between underpricing and investment bank reputation. Therefore, H11 is rejected.

The result is inconsistent with previous research which found a significant negative relationship between investment bank reputation and underpricing (Beatty and Ritter, 1986; Carter et al., 1998; Carter and Manaster, 1990; Logue, 1973). Ljungqvist and Wilhelm (2003) argues that the greater the asymmetry information between the IPO firm and the underwriter, the higher the value of the underwriter's role in the IPO as a certifier. The role played by investment banks in Malaysia may be perceived by investors as an intermediary between the firm and the authorities (as the Securities Commission and Bursa Malaysia requires the firm to appoint an investment bank to facilitate the IPO), and not as a certifier of the quality of the IPO firm as suggested by previous research. Further, as the number of clients the investment banks sign up with increases, they will also expand their manpower capacity to handle the increasing volume of work as well as skills and knowledge, and consequently attract even bigger

number of IPO clients. As such, investors may not perceive the appointment of high reputation investment banks as a signal of quality. Therefore, there is no correlation between underpricing and the reputation of the investment bank advising the IPO firm.

4.3.12 Auditor Reputation

Hypothesis H12 states that underpricing is negatively related to the auditor reputation. The data analysis using Spearman rho correlation tests results in a coefficient of -.092 with a *p*-value of .150. Based on the results, there is no correlation between underpricing and auditor reputation. Therefore, H12 is rejected.

The result is inconsistent with previous research which found a negative relationship between auditor reputation and underpricing (Beatty, 1989; Feltham et al., 1991; Michaely and Shaw, 1994; Marshall, 2004). Previous research suggests that high-quality firms will appoint high-reputation auditors. However, the results of this research suggest that investors do not perceive the appointment of high reputation auditor as a signal of quality. The role played by auditors are limited to auditing past performance and not on future performance. Further, as the number of clients the auditors sign up with increases, they will also expand their manpower capacity to handle the increasing volume of work as well as skills and knowledge, and consequently attract even bigger number of new clients. Hence, investors may not necessarily perceive high reputation auditor as certifier of quality of the IPO firms. Therefore, there is no correlation between underpricing and the auditor reputation.

4.3.13 Retained Shareholding

Hypothesis H13 states that underpricing is positively related to the proportion of the retained shareholding. The data analysis using Spearman rho correlation results in a coefficient of -.076 with a *p*-value of .194. Based on the results, there is no correlation between underpricing and retained shareholding. Therefore, H13 is rejected.

The result of this research shows that there is no correlation between underpricing and retained shareholding. The result is inconsistent with previous research which found a positive relationship between retained shareholding and underpricing (Daily et al., 2003; Hanley, 1993; Jensen and Meckling, 1976; Habib and Ljungqvist, 2001). Previous studies suggest that the proportion of shareholdings retained by the pre-IPO shareholders signals their confidence in the firm's future prospects (Daily et al., 2003). Bursa Malaysia's rules requires that at least 25% of a public firm's shares be held by public shareholders, and therefore pre-IPO shareholders have the option to hold up to 75% of the firms shares. The mean retained shareholding held in the IPO firms in the sample is 65.20% (SD = 9.90%). The descriptive statistics suggest a narrow gap between the proportion of retained shareholding in the IPO firms and the maximum allowed by Bursa Malaysia. Hence, investors may not perceive retained shareholding as a signal of firm prospects as the difference in the retained shareholding amongst the IPO firms is not significantly wide. Therefore, higher retained shareholding does not result in higher underpricing.

4.3.14 Subscription Rate

Hypothesis H14 states that underpricing is positively related to the subscription rate. The data analysis using Spearman rho correlation tests results in a coefficient of.170 with a *p*-value of .027. Based on the results, there is a weak positive correlation between underpricing and subscription rate. Therefore, H14 is accepted.

The result is consistent with previous research which found a positive relationship between subscription rate and underpricing (Chowdhry and Sherman, 1996; Kenourgios et al., 2007; Chemmanur, 1993; Beatty and Ritter, 1986). When the information on the subscription rate becomes available after the closing of the IPO, investors who were not allotted shares in the balloting or investors who did not subscribe for the IPO shares will realise that there was an overwhelming demand for the IPO firm's share. They will therefore purchase the firm's shares on the first day of the trading. Their demand will push the firm's share price up resulting in high first day closing price, which will result

in high level of underpricing. Therefore, higher subscription rate results in higher underpricing.

4.3.15 Stock Market Performance

Hypothesis H15 states that underpricing is positively related to the stock market performance. The data analysis using Spearman rho correlation tests results in a coefficient of -.190 with a *p*-value of .015. Based on the results, there is a weak negative correlation between underpricing and stock market performance. Therefore, H15 is rejected.

The result of this research shows that there is a weak negative correlation between underpricing and stock market performance. The result is inconsistent with previous research which found a positive relationship between stock market performances and underpricing (Ibbotson and Jaffe, 1995; McGuinness, 1992; Dimovski and Brooks, 2004). When the stock market is performing well or on the rise, investors will hold the IPO shares with the expectation of deriving higher returns when the market rises further. While there will be demand for the shares in secondary market, shareholders who were allotted the IPO shares may not sell the shares on the first day of trading and underpricing is measured as the difference between the offer price and the first day closing price. Another explanation is that investors perceive that firms have already factored the rising market sentiment into the offer price and as a result the price on the secondary market on the first day of trading will not be significantly higher from the offer price and therefore will result low in underpricing. Therefore, higher stock market performance does not result in higher underpricing.

4.3.16 Summary of the Hypothesis Testing

Table 4.3 summarises the outcome of the testing of the 15 hypotheses.

4.4 Conclusions

This research found mean underpricing of 12.15% for period of 2001-2011. On a year-to-year basis, the mean underpricing was the highest in 2003 at 27.35%. The research also found that IPOs were overpriced in 2001 and 2008 where the mean underpricing was 5.97% and 8.95% respectively for the two years. There was no obvious trend in underpricing during the study period. Accordingly, H1a was accepted as there was evidence of underpricing while H1b was rejected in the absence of a trend in underpricing over the study period.

There was no significant correlation between underpricing and whether the IPO firms are Bumiputera firms or non-Bumiputera firms. Similarly, there was no significant correlation between underpricing and industry of the firms. Accordingly, H2 and H5 relating to the correlation between underpricing and the two independent variables namely Bumiputera firm and industry were accepted.

Table 4.3

Summary of the Hypotheses Testing Results

Hypothesis	Results	Nature of results/correlation
H1a	Accepted	Descriptive statistics shows IPOs in the sample were underpriced
H1b	Rejected	-
H2	Accepted	There no correlation between underpricing and Bumiputera firm
H3	Rejected	-
H4	Rejected	-
H5	Accepted	There no correlation between underpricing and industry of the firm
H6	Accepted	There is a weak positive correlation between underpricing and placement share
H7	Rejected	-
H8	Rejected	-
H9	Accepted	There is a weak negative correlation between underpricing and secondary share.
H10	Rejected	-
H11	Rejected	-
H12	Rejected	-
H13	Rejected	-
H14	Accepted	There is a weak positive correlation between underpricing and subscription rate.
H15	Rejected	There is a weak negative correlation between underpricing and stock market performance.

The research found a positive correlation between underpricing and placement share, and a negative correlation between underpricing and secondary share. Accordingly, H6 and H9 relating to correlations between underpricing and the two independent variables, namely placement share and secondary share were accepted. The research found a positive correlation between underpricing and subscription rate and a negative correlation between underpricing and the stock market performance. Accordingly H14 and H15 relating to the correlation between underpricing and the two independent variables, namely subscription rate and stock market performance was accepted.

The study found no correlation between underpricing and the independent variables age, size, gross proceeds, listed firm/entrepreneur shareholder, offer price, investment bank reputation, auditor reputation and retained share. Accordingly, H3, H4, H7, H8, H10, H11, H12 and H13 are rejected.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

5.1 Introduction

The objective of this research is to investigate the factors which influence the equity investors' valuation of IPO firms. The difference between the offer price and first day closing price is the additional value which investors ascribe to IPO firms. Specifically, this research investigates fifteen factors derived from literature review which may be related to the performance of the IPOs on the first day of trading.

This chapter presents a summary of the research results, evaluates the conceptual framework, discusses the implications of the research results, sets out the limitations of the research and discusses future research opportunities.

5.2 Summary of Research Results

This section summarises the results of the tests of each of the 15 hypotheses formulated in this research. H1 which is related to RQ1 is tested through the results of the descriptive statistics. H2 to H15 which are related to RQ2 are tested through Spearman rho correlation tests.

5.2.1 Underpricing

The results of the research show that the IPOs in the study period 2001 to 2011 were underpriced by 12.15% but there were no observable trend of underpricing over the study period. The study also showed that the IPOs were overpriced in 2001 and 2008. The overpricing in 2001 can be explained by the Asian Financial crisis in 1987/88. The crisis had a major impact on the financial performance of firms in Malaysia. Firms which had planned to list subsequent to the crisis may have had difficulties meeting

Bursa Malaysia's quantitative criteria which require firms to have a minimum uninterrupted profit track record over three to five years. This explains the low number of IPOs in 2001. The overpricing also shows that following the crisis, investor's confidence had not returned by 2001.

Malaysia was hit by the Global Financial Crisis in 1998/99. The capital market deteriorated during the period and together with it, investors' confidence. This explains the low number of IPOs in 1998 and the overpricing in the year.

5.2.2 Bumiputera Firm

This research found that there is no correlation between underpricing and whether the IPO firms are Bumiputera firms or non-Bumiputera firms. The results show that investors do not differentiate between Bumiputera firms and non-Bumiputera firms in making their investment decisions, since all IPO firms have to meet the minimum quantitative and qualitative criteria for listing by the Securities Commission. The operation of market microstructure observed in other markets in other research such as Chen et al. (2000), Hensler et al. (2000) and Nandha and Sawyer (2002) where the market distinguishes micro-factors which influences certain variables is not applicable in the context of categorisation of IPO firms into Bumiputera firm and non-Bumiputera firm. Therefore, there is no correlation between underpricing and Bumiputera firm.

5.2.3 Age and Size

This research found that there is no correlation between underpricing, and the firm age and size. Previous studies suggest that uncertainty and information asymmetry associated with older and larger firms are less and accordingly less underpriced. The results of this research show that investment decisions related to IPO firms are not influenced by the age and size of the firm. This may be because investors perceive that past performance may not necessarily reflect future performance and profitability. The ability to access resources such as finance is determined by the future prospects and

cash flow of the firm and not age or size of the firm. Further, older and larger firms may not necessarily be ready or flexible to adapt to changing industry dynamics, technological innovations and market demands. The information asymmetry gap perceived to exist amongst investors with younger and smaller firms is narrowed with the issuance of a standard prospectus governed by the minimum disclosure requirements set by the Securities Commission. Therefore, older and larger firms does not result in higher underpricing.

5.2.4 Industry

This research found that there is no correlation between underpricing and industry of the firm. Previous research explained the relationship between underpricing and industry of the IPO firms primarily based on the industry profile of the IPO firms: growth industries and high risk industries (Loughran and Ritter, 2004; Suchard and Woo, 2003). The IPO firms in the sample cannot be categorised as falling under the growth industries or risky industries. Therefore, the high underpricing observed in IPO firms from growth and risky industries are not observed in this research.

5.2.5 Placement Share

This research found that there is a weak positive correlation between underpricing and placement share. When IPO firms offer proportionately large number of shares to institutional and high net-worth individuals through share placement compared to the number of shares offered to retail investors, retail investors who were not allotted the shares through the balloting will create high demand for the shares on the first day of trading. The high demand will translate into high first day trading price. Hence, the high proportion of placement shares will result in high underpricing.

5.2.6 Gross Proceeds

This research found that there is no correlation between underpricing and gross proceeds. Previous studies associated high gross proceeds with large established firms which are considered less risky and therefore result in lower underpricing (Carter et al., 1998) while small firms are associated with speculation and therefore result in higher underpricing (Tinic, 1988). Since the Securities Commission approves the utilisation of the gross proceeds which are disclosed in the prospectus, and the utilisation of which is audited and reported to the shareholders annually, investors may not perceive gross proceeds as a reflection of the riskiness of the IPO firm as an investment nor are the shares of the IPO firm's shares subject to speculation. Instead, investors may perceive that the objective of the gross proceeds is to fulfil the IPO firm's capital requirement and to expand its business capacity and capability. Therefore, higher gross proceeds does not result in higher underpricing

5.2.7 Listed Firm/Entrepreneur Shareholder

This research found that there is no correlation between underpricing and listed firm/entrepreneur shareholder. While the listed firm/entrepreneur shareholder will be able to replicate some of the business strategies as well as governance and controls in the new IPO firm, the new IPO firm will have its own risk profiles and subject to its own industry/business dynamics and require a different set of management skills which the listed firm/entrepreneur shareholder may not possess. Therefore, investors may not ascribe additional value to a firm if it has a listed firm/entrepreneur shareholder. Therefore, having a listed firm/entrepreneur shareholder does not result in higher underpricing.

5.2.8 Secondary Shares

This research found that there is a weak negative correlation between underpricing and secondary share. When pre-IPO shareholders sell their shares as part of the IPO

exercise they do not have the incentive to sell the shares at low price as it will translate into less cash proceeds for them. Accordingly, IPOs involving large secondary share offerings will be less underpriced compared to small secondary shares offerings. Therefore, higher secondary shares do not result in higher underpricing.

5.2.9 Offer Price

This research found that there is no correlation between underpricing and offer price. Previous studies shows that low IPO price results in high underpricing as low pricing indicates that the firm's prospect are uncertain while high risk IPO firms can signal quality by setting the IPO price low. The offer price is set after taking into account the firms asset value as well as its prospects. Further, the managers of the IPO firm and its investment bank will set the offer price after benchmarking the IPO firm against similar firms listed on Bursa Malaysia. Therefore, higher offer price does not result in higher underpricing.

5.2.10 Investment Bank and Auditor Reputation

This research found that there is no correlation between underpricing, and investment bank and auditor reputation. Previous studies supported a negative relationship between underpricing, and investment bank and auditor reputation, based on the rationale that both the investment bank and auditors play the roles of certifiers of the quality of the firm. The role played by investment banks in Malaysia may be perceived by investors as an intermediary between the firm and the authorities and not as a certifier of the quality of the IPO firm as suggested by previous research. Further, as the number of clients the investment banks sign up with increases, they will also expand their manpower capacity to handle the increasing volume of work as well as skills and knowledge, and consequently attract even bigger number of IPO clients. On the other hand, the role played by auditors is limited to auditing past performance and not future performance. Similar to investment bank, as the number of clients the auditors sign up with increases, they will also expand their manpower capacity to handle the increasing

volume of work as well as skills and knowledge, and consequently attract even bigger number of new clients. Therefore, there is no correlation between underpricing, and the reputation of the investment bank and the auditor.

5.2.11 Retained Shareholding

This research found that there is no correlation between underpricing and retained shareholding. Bursa Malaysia's rules require that at least 25% of a public firm's shares be held by public shareholders, and therefore pre-IPO shareholders have the option to hold up to 75% of the firms shares. The mean retained shareholding held in the IPO firms in the sample is 65.20% (*SD* = 9.90%). The descriptive statistics suggest a narrow gap between the proportion of retained shareholding in the IPO firms and the maximum allowed by Bursa Malaysia. Hence, investors may not perceive retained shareholding as a signal of firm prospects as the difference in the retained shareholding amongst the IPO firms is not significantly wide.

5.2.12 Subscription Rate

This research found that there is a weak positive correlation between underpricing and subscription rate. Once information on the subscription rate becomes available after the closing of the IPO, investors who were not allotted shares in the balloting or investors who did not subscribe to the IPO shares would realise that there was an overwhelming demand from investors for the IPO shares. The investors who were not successful or failed to subscribe will then create an overwhelming demand for the IPO firm's shares on the first day of the trading which will result in high level of underpricing. Therefore, higher subscription rate results in higher underpricing.

5.2.13 Stock Market Performance

This research found that there is a weak negative correlation between underpricing and stock market performance. When the stock market is performing well or on the rise, investors who were allotted the IPO shares may not sell the shares on the first day of trading with the expectation of deriving higher returns when the market rises further. Another explanation is that investors perceive that firms have already factored the rising market sentiment into the offer price and as a result the price on the secondary market on the first day of trading will not be significantly higher from the offer price. Therefore, higher stock market performance results in lower underpricing.

5.3 Evaluation of the Conceptual Framework

The conceptual framework of this research is depicted in Figure 1.1 (Chapter 1). The framework was derived from seven models, namely, microstructure, winner's curse, signalling, certification, ownership, liquidity and investors' sentiment.

The results of this research show that four factors, namely, placement share, secondary share, subscription rate and stock market performance, are related to underpricing. The results also show that ten others factors, namely Bumiputera firm, age, size, industry, gross proceeds, listed firm/entrepreneur shareholder, offer price, investment bank reputation, auditor reputation and retained share are not related to underpricing.

The results of this research supports three of the models, namely winner's curse, liquidity and investor sentiment which can be used to explain underpricing in Malaysia. The winners curse model is represented by the placement share and secondary share variables which are related to underpricing. The liquidity and investor sentiment models are respectively represented by the subscription rate and stock market performance variables which are related to underpricing. The other four models, namely microstructure, signalling, certification and ownership do not explain underpricing in Malaysia as the variables which represents the models are not related to underpricing.

5.4 Implication of the Results

This research intended to identify the factors which are related to underpricing in Malaysia. The mean underpricing for the study period from 2001 to 2011 is 12.15% with no observable trend in underpricing during the period. Two of the variables related to the firm, namely placement shares and secondary shares, were found to be correlated with underpricing. Two other variables which are not related to the firm, namely subscription rate and stock market performance, were found to be correlated to underpricing. The subscription rate variable is a consequence of the investment decision made by the investors and only becomes known after the closing of the IPO. The stock market performance on the other hand is an external factor. Ten other variables, namely Bumiputera firm, age, size, industry, gross proceeds, listed firm/entrepreneur shareholder, offer price, investment bank reputation, auditor reputation and retained share do not effect underpricing.

One possible explanation for the results of this research is the role played by the regulatory authorities in approving the IPO firms for listing. There are at least four regulatory authorities involved in approving the IPOs. The Securities Commission plays a major role in approving the IPOs. While the firms applying for listing would have met the minimum quantitative criteria on profits and paid-up capital, the Securities Commission may reject an application due to a number of reasons. The Securities Commission's website *(http://www.sc.com.my /paper.asp?pageid=1116&year=2011)* lists corporate governance issues, future prospects, insufficient working capital, absence of core business and conflict-of-interest between the parties involved in the firm's business as reasons for rejecting an IPO application. The Bursa Malaysia, on the other hand approves the application for listing of the shares and reviews and vets the prospectus issued to potential investors. The prospectus which forms part of the documentation submitted to the Securities Commission is also reviewed by the Securities Commission. The Ministry of International Trade and Industry approves the Bumiputera shareholdings in the firms, while the Foreign Investment Committee of the Prime Minister's Department approves IPO firms which have foreign investments.

Only after the approvals have been obtained from the above authorities can a prospectus be issued to investors. Hence, investors may make their investment decision based on the assumption that the quality of the IPO firm has been certified by the regulatory authorities. Since the firms can be perceived to have met the minimum quality with the approvals, investors will have to consider external variables such as the stock market performance to make their investment decision. The foregoing also confirms that while information disclosed in the prospectus must meet the minimum disclosure requirements, it may not be widely perused and relied on by investors to make their investment decisions, particularly if they are only interested in short term gain in the form of first day returns. This explains why the request for IPO prospectus is low in Malaysia. It has been a common complain among investment banks in Malaysia that prospectuses issued are usually not fully taken by investors. This may also be due to the fact that the information disclosed in the prospectuses is not useful to investors.

For owners of IPO firms and investment banks, once approval has been granted by the authorities, one of the critical factors to consider prior to launching their IPO is the timing, that is, how the stock market is performing. For the owners of the IPO firms, the proportion of secondary shares they offer to the public, and the proportion of placement shares they reserve for institutional and high net worth individuals should be considered seriously as it influences the first day return. Another factor which owners of IPO firms should be aware of is that investors may be considering qualitative factors such as quality of directors and management, risk factors, research and development activities and future prospects which are not investigated in this research.

Following the results of this research, I propose the following recommendations to investment banks and the Securities Commission. Investment banks may first study the process through which investors make their IPO investment decisions. Investment banks may also undertake a survey to determine the information which investors use to make their investment decisions, and the additional information they want the IPO firms to disclose in the prospectus. The aforesaid initiatives will help to bridge the information asymmetry between IPO firms and investors and assist investors in making their investment decisions. Thirdly, investment banks may also find it useful to identify the reasons why prospectuses are not fully taken up by investors and the investors'

preferred medium of information disclosure, such as the use of audio-visual presentations by the management of the firm in addition to the printed prospectus.

Based on my findings, the proportion of shares reserved for placement relative to the shares reserved for retail investors, and the proportion of shares retained by the pre-IPO shareholders are high. As a result of the two factors, the proportion of shares available for trading in the secondary market will be relatively small. As such, the Securities Commission may find it useful to study the effect of firms reserving high proportion of IPO shares for placement relative to the shares reserved for retail investors. Secondly, the Securities Commission may also find it useful to study the effect of lowering the maximum percentage of shareholdings which can be held by major shareholders from the current 75%. This will allow the public shareholders to hold a high percentage of the firm's shares and trade in the secondary market.

5.5 Limitations of the Research

There are a few limitations which may have influenced the finding of this research. One of the limitations is the size of the sample. There were only 157 IPOs on the Main Market over the study period 2001-2011 and after the elimination process, the sample size has been reduced to 130 firms. Inclusion of the Second Board IPOs would be redundant as the board has ceased to exist since 3 August 2009.

Another limitation of this research is that the variables studied are quantitative while there might be qualitative information such as quality of management, investors' perspective of the management and perceived connection between major shareholders and management, and politicians which may have influenced underpricing. The qualitative variables are not studied in this research.

The research results may have been affected by the performance of the financial market and economy. The Asian financial crisis which hit the region in 1997/98 and the global financial crisis in 2008/09 affected the Malaysian capital market. The overpricing in

2001 and 2008 shows that investors' confidence in IPOs had declined in those two years. As such, the crisis may have also influenced the results of this research.

5.6 Recommendation for Research Opportunities

This research used fifteen variables and save for two variables, namely Bumiputera firm and listed firm/entrepreneur shareholder, all the other thirteen variables have been studied in previous studies. The results also show that of the twelve internal variables related to the firm, only two variables, placement share and secondary share, are correlated with underpricing. The research results also show that an external variable, the stock market performance, is correlated to underpricing.

I stated in the earlier section that investors may have perceived the role of regulatory authorities as certifiers of the quality of the firm and once an IPO firm is approved for listing, the quality of the firm is assured. Therefore investors may be observing external factors such as the stock market performance for investment decisions. A possible area for future research is to explore other possible external factors related to capital market and performance of the economy such as interest rates, exchange rates and economic growth.

Another possible area for research is the relationship between underpricing and qualitative information on the IPO firm, such as quality of directors and management, research and development activities, risk factors which affect the businesses, reliance on exports, reliance on imports for raw materials, and expansion overseas.

5.7 Conclusions

This research intended to identify the variables of underpricing in Malaysia. The mean underpricing for the study period from 2001 to 2011 is 12.15% with no observable trend in underpricing during the period. The research results show that four variables are correlated to underpricing, namely, placement share, secondary share, subscription rate and the stock market performance. Of the four variables, only information on

placement share and secondary share are disclosed in the IPO prospectus. The information on the subscription rate only becomes available after the closing of the IPO. Hence, management and owners of IPO firms, investment banks and investors may take cognisant of the number of placement share and secondary share as well as observe the performance of the stock market prior to the launch of the IPO to forecast the level of first day returns they might obtain from their IPOs. The results of the research shows that ten other variables, namely Bumiputera firm, age, size, industry, gross proceeds, listed firm/entrepreneur shareholder, offer price, investment bank reputation, auditor reputation and retained share do not effect underpricing. While these variables do not effect underpricing, they are the basic information disclosed in the prospectus which investors would like to possess before even considering the IPO firm for investment.

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