Information Asymmetry and Signalling in Emerging IPO Markets: The Case of Malaysia

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ABSTRACT

Manuscript type: Research paper

Research aims: This study examines the effect of information asymmetry on the relationship between the signalling variables and the initial returns of IPO. The signalling variables examined include lock-up period, underwriter reputation, auditor reputation, and board reputation. This study also examines the ability of signalling variables in reducing information asymmetry (the average first ten days of Bid/Ask spread is used as proxy for information asymmetry) around listing firm's issues.

Design/Methodology/Approach: This study employs cross-sectional regression model to examine the influencing effect of information asymmetry on the relationship between signalling variables and initial returns of IPOs, and to investigate which of the signals are able to reduce the level of information asymmetry surrounding the listing firm's issues in the Malaysian IPO market. The study sample consists of 393 IPOs listed on Bursa Malaysia between January 2000 and December 2015.

Research findings: The results show that the effect of signalling variables is more pronounced on the initial performance of

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IPOs when in an environment of high information asymmetry. Evidence also indicates that board reputation is able to reduce the under-pricing cost borne by listing firms by lowering the level of information asymmetry regarding the listing firm's issues. Underwriter reputation is able to reduce the level of information asymmetry regarding listing firm's issues, but unable to influence the initial returns of IPOs. Further, auditor reputation is able to reduce the under-pricing cost, but unable to reduce the level of information asymmetry regarding the listing firm's issues. Finally, lock-up period is unable to reduce the level of information asymmetry as well as under-pricing with regards to the listing firm's issues.

Theoretical contribution/Originality: The effect of information asymmetry on the relationship between signalling variables and initial returns, and the effect of signalling variables on information asymmetry remains unexplored in the Malaysian IPO market. This gap is addressed by the current study.

Practitioner/Policy implication: The findings imply that underwriter reputation, auditor reputation, and board member reputation are important for determining the initial returns of the IPOs. They are also important for reducing the level of information asymmetry surrounding the listing firm's issues. Therefore, it is reasonable to suggest that information regarding these signals be disclosed completely to investors since current disclosure practices in Malaysia only embed fragmented information.

Research limitation/Implications: In the present study, the Bid/Ask spread is used as proxy for information asymmetry. Future studies should consider other indicators such as the heterogeneity of investors' opinion on the true value of the listing firm's issues. This is because the fixed price method provides no opportunity for prospective investors to reflect on their expectations and beliefs on the IPOs' issue price. As such, the fixed-price offering will have higher divergence of opinions among investors when compared to other pricing mechanisms such as the book-building method.

Keywords: Information Asymmetry, Initial Returns, Malaysia IPO Market, Signalling
JEL Classification: D53, D82, G11, G02, G24, N25

1. Introduction

The level of information asymmetry is high in the Malaysian Initial Public Offering (IPO) market (Yong, 2015; Mohd Rashid, Abdul-Rahim, & Yong, 2014.). In such an environment, low-value firms are, strictly,

better off than high-value firms (Akerlof, 1970). This situation causes high-value firms to withdraw from the market. Rock (1986) argued that uninformed investors are often challenged by this incident of information asymmetry, which is also the main cause of under-pricing in the IPO market (Yong, 2015). The higher the level of information asymmetry around the new issues involving the IPO, the more the under-pricing (Beatty & Ritter, 1986). It has been argued that the high level of information asymmetry in the Malaysian IPO market is caused by weak investor protection and corporate control (Yatim, 2011). In addition, the IPO market in Malaysia uses the fixed-price method in deciding the offer price of IPOs (Yong, 2015).

One possible measure to overcome the prevalence of information asymmetry is to invest in "actions" which low-quality firms do not find worthwhile imitating. These actions are called signals. Welch (1989) was among the first to propose a signalling model in which issuers use available information as a method to signal private information regarding the value and quality of their firms to prospective investors. Spence (1973) concluded that investors could make use of the available information in the prospectus to look for signals that are able to reduce their uncertainties about the prospect of the listing firms. The current study considers four signalling variables, which include underwriter reputation, auditor reputation, board reputation, and lock-up period due to their overall and individual contributions to the IPO literature.

Most Malaysian literature (such as Yong, 2015; Abdul-Rahim & Yong, 2010; Low & Yong, 2011) investigated the initial performance of IPOs through limited sets of unique variables such as institutional investor involvement, demands and supply of IPOs, and market conditions. The literature had fallen short of considering other variables, which the IPO literature deems significant in influencing the initial performance of IPOs, for instance, the reputation of the underwriter, auditor, board, and lock-up period. Moreover, there is scant Malaysian literature investigating the influencing effect of information asymmetry on the Malaysian IPO market. Most studies tend to only consider the relationship of the individual signal rather than the multidimensionality of the signalling environment. This leads to results which suffer from the lack of variable bias (Keasey & Short 1997).

Aiming to address this gap, the current study thus investigates the effect of information asymmetry on the relationship between the signalling variables used and under-pricing. In addition, this study also investigates the ability of the study signals in reducing the level

of information asymmetry around its respective shares (issues or IPO). The present study is also concerned with examining the overall effect of the signalling variables on the initial return of the IPOs. This is because, most past studies only considered the individual relationship of each signalling variable with the initial return, such as shareholder retention (Clarkson, Dontoh, Richardson, & Sefcik, 1991; Habib & Ljungqvist, 2001; Leland & Pyle, 1977), underwriter reputation (Dimovski, Phila-vanh, & Brooks, 2011; Kenourgios, Papathanasiou, & Melas, 2007), lock-up period (Michaely & Shaw, 1994; Mohd Rashid et al., 2014), auditor reputation (Michaely & Shaw, 1995), and board reputation (Certo, Daily, & Dalton, 2001; Yatim, 2011). It appears that their overall relationship had been overlooked. In this study, each of the signalling variables is selected due to their contribution to literature.

The first of these signalling variables, underwriter reputation is considered to be one of the major influencing factors on the initial performance of IPOs (Kenourgios et al., 2007; Dimovski et al. 2011). Some studies have investigated the relationship between underwriter reputation, and the initial return of IPO in the context of the Malaysian IPO market. For instance, Jelic, Saadouni and Briston (2001) studied a sample of 182 Malaysian IPOs from 1980 to 1995. Expanding on Jelic et al. (2001), the present study examines samples of Malaysian IPOs from 2000 to 2015, with the hope of uncovering new evidence, which can indicate the influencing effect of underwriter reputation on the initial returns of IPOs and information asymmetry.

The second signalling variable of board reputation is traced to Yatim's (2011) work, however, this study narrows the definition of board reputation as the independent non-executive director (INED) members of the board. The INED members are the focus of the current study because Bursa Malaysia Securities (BMS) has a set of criteria, which define the INED as outlined in its listing requirements. Such criteria help to safeguard the relationships and transactions that may impair the director's independence. Fama (1980) had argued that INEDs have an important role to play in monitoring management actions, and in providing valuable business networking and expert knowledge for management.

The third signalling variable is the lock-up period, a heavily regulated variable in the Malaysian IPO market where new issuing firms do not have the privilege of choosing the lock-up period for its firms respectively, whether one-year period before 2009, or six months' period after 2009. The firms also do not have the choice of implementing

the lock-up period for their own firms. For that reason, the current study aims to uncover whether the lock-up period still holds any relationship with the initial returns due to the mandatory regulation placed by the Securities Commission (SC). It is predicted that the signalling role of the lock-up period is not available in the Malaysian market due to the enforced regulation of the lock-up period.

The final signalling variable used is the auditor reputation. This study investigates the relationship that exists between auditor reputation and the initial returns of IPOs as noted by Yong (2007a) who mentioned that this is a lacking aspect in the Asian region.

The remainder of this paper is structured as follows: Section 2 discusses the literature and hypotheses of the study, Section 3 introduces the data and methodology employed, Section 4 presents the results, and Section 5 concludes.

2. Literature Review and Hypotheses

The IPO market in Malaysia is characterised by a high level of infor-mation asymmetry between prospective investors and the issuing firms (Yong, 2015; Mohd Rashid et al., 2014). This phenomenon can be attributed to the weak investor protection being practised (La Porta, Lopez-de Silanes, Shleifer, & Vishny, 2000), high family ownership concentrations (Claessens, Djankov, & Lang, 2000), and the inadequate corporate controls imposed by less-developed markets (La Porta et al., 2000). From the Malaysian perspective, Yatim (2011) had noted that the local equity market exhibited all of these institutional features which caused the level of under-pricing to be greater than other developed markets. From another perspective, Hemmer and Bardhan (2000) argued that the low level of institutional development in the Asian countries can be attributed to two causes: (1) the traditional institutions of exchange in developing countries seldom evolve into more complex rules (impersonal, open, legal rational) or institutions of enforcement, and (2) inequality in the distribution of power and resources caused by strategic distributive conflicts among different social groups. High-level information asymmetry in the Malaysian IPO market can also be attributed to the practice of the fixed-price mechanism used by listing firms. In the fixed-price method, the offer price of the issuing firm is already set by the lead investment banker even before the listing date. This deprives potential investors of the opportunity to acquire the necessary information. In contrast, the book-building and

auction offering methods permit issuing firms to extract information from the investors regarding the value of the IPO before setting up the offer price. Thus, the fixed-price method, which does not provide any opportunity for investors to reveal their private valuations of the new issue, will create a higher level information asymmetry as compared to other pricing mechanisms like book-building and auction offerings (Yong, 2015; Chowdhry & Sherman, 1996). Extending on this, Zhang, Zhang, Huang and Zhou (2015) asserted that under-pricing through the book-building method is much lower as compared to the fixed-priced mechanism. This is because the fixed-priced mechanism leads to higher level under-pricing (Yong, 2015). This had been proven by Chowdhry and Sherman (1996) whose model depicted that most of the Asian IPO markets using the fixed-price mechanism had more extreme under-pricing as compared to countries using the book-building method or the auction method to price their IPOs.

The Asian financial crisis of 1997 to 1998 has nonetheless, enabled the Malaysian capital market to develop a better regulatory framework and stronger infrastructure. Malaysia was able to do so through several initiatives. For instance, to mitigate the crisis, the SC introduced the Malaysian Code on Corporate Governance (MCCG) in 2000 (latest revision 2007). For strengthening the standards of investor protection, the SC issued the Capital Market Masterplan (CMP) in 2001; it focused on enhancing disclosure and governance standards. The Malaysian government, subsequently also introduced the Third Outline Perspective Plan 2001-2010 (OPP3) in April 2001; it promoted the idea of leapfrogging to a knowledge economy. Following this, the Malaysia Capital Market Masterplan was drafted to guide the development of Malaysia's capital market during the period of 2001-2010. The CMP laid out a structured and comprehensive reform plan that sought to establish new markets, asset classes, and intermediaries as well as to strengthen existing ones. The CMP was developed with the view to establish domestic capital markets that would be internationally competitive, and able to fulfil the needs of domestic issuers and investors, thereby facilitating long-term economic growth, in line with Malaysia's national development plans.

Of the 2001-2010 period overseen by the CMP, Malaysia had achieved notable successes in broadening and deepening its capital market; its corporate bond market grew steadily. Today, Malaysia's corporate bond market is much larger than those of most other emerging-market countries, comparable in size to those in many

developed countries. The key driver of this growth is traced to its Islamic bond market. Today, about 60 per cent of Malaysia's bond issuance is Sharia-compliant, and the Malaysian market also accounts for 60 per cent of the Islamic bonds issued worldwide presently. However, efforts to enhance the equity market have yielded many mixed results. The number of companies listed on Bursa Malaysia had declined in the past decade as represented in Figure 1.
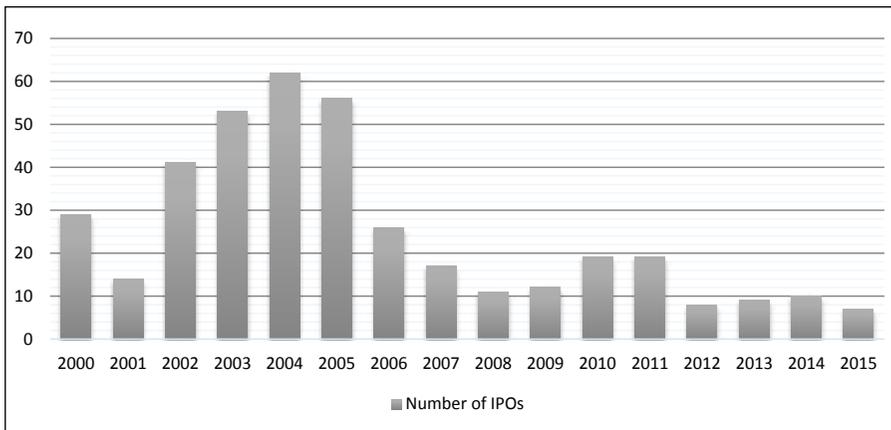

Figure 1: Number of IPOs Issued between January 2000 and December 2015

2.1 Initial Returns of IPO in Malaysia

The initial returns of the Malaysian IPO market taken from various study periods are illustrated in Figure 2, where the x-axis represents the period covered by each study.

In this figure, it seemed evident that there was a noticeable decline in the initial returns. This could be attributed to the strengthening of the regulatory environment by the Malaysian government as well as the strict impositions set by the investment banks which aimed to manage the listing process of the new issues more stringently. Abdul-Rahim and Yong (2008) mentioned that such a declining trend noted in the initial performance of IPOs in the Malaysian market could be associated with the SC's decision to liberalise the IPO pricing mechanism in 1996. It may also be due to various measurements taken by the SC and the Malaysian government in counteracting the adverse effect of the 1997/1998 Asian Financial Crisis.
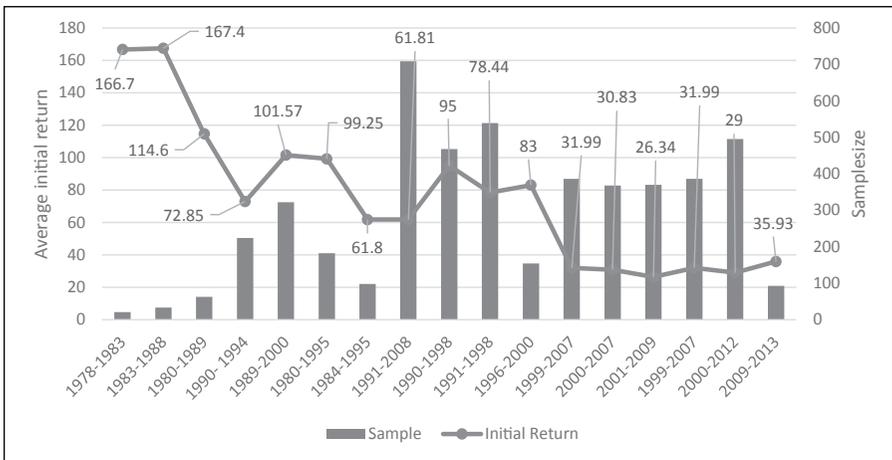
Figure 2: Average Initial Return of the Malaysian IPO Market
Source: Published articles as compiled by the authors.

Despite the efforts taken by both the government and the investment banks, it appeared that the average initial return in Malaysia was still high. From Figure 2, it can be noted that the most current initial return was around 35 per cent between 2009-2013, as shown by Yong (2015). This occurrence was probably caused by the high level of the information asymmetry. The result of the Malaysian IPO initial return was considered as high when compared to other Asia-Pacific IPO markets as shown in Figure 3. One possibility for the high initial returns could be due to the high information asymmetry in the IPO market (Allen & Faulhaber, 1989; Grinblatt & Hwang, 1989; Welch, 1989).
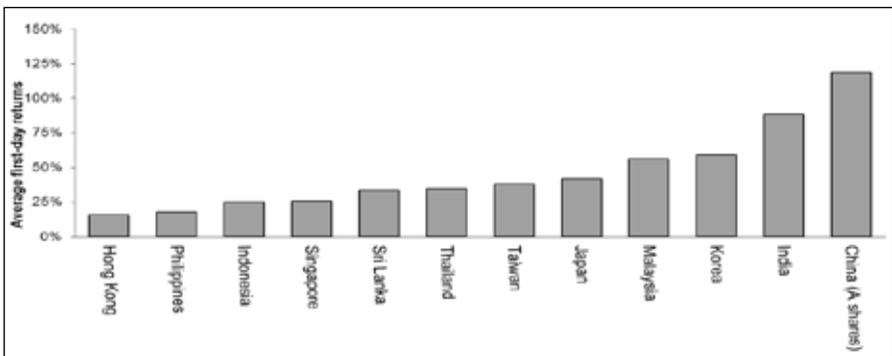

Figure 3: Average Initial Performance of Various Asia-Pacific IPO Markets
Source: Warrington College of Business (n.d.).

Another possibility is the weak legal enforcement in Malaysia (Rad & Embong, 2014).

2.2 Effect of Information Asymmetry on the Relationship between Signalling and Initial Returns

Information asymmetry is an issue that is closely connected to IPOs. As mentioned earlier, this occurs because prospective investors have limited access to the information of privately owned (unlisted) firms. Although issuing firms are obligated by law to disclose their information via the prospectus, potential investors may be unable to retrieve the information they desire due to the over-informative report provided by the prospectus (Spence, 1976; Mohd Rashid et al., 2014). Consequently, investors search for alternative signals to evaluate the issuing firm's value (Mohd Rashid et al., 2014). This behaviour could cause an increase in the information asymmetry in the IPO market. There is significant empirical evidence indicating that in the case of severe asymmetric information, the insiders' behaviour may be used to gauge stock prices. This conjecture is consistent with the argument forwarded by Carter and Manaster (1990) and Leland and Pyle (1977) who mentioned that the signalling hypothesis is becoming more critical in an environment characterised by severe information asymmetry. Based on the previous argument, the following hypotheses are developed:

H_{1a}: The effect of the lock-up period will be greater on the initial return in the case of high information asymmetry versus low information asymmetry.

H_{2a}: The effect of the underwriter reputation will be greater on the initial return in the case of high information asymmetry versus low information asymmetry.

H_{3a}: The effect of the auditor reputation will be greater on the initial return in the case of high information asymmetry versus low information asymmetry.

H_{4a}: The effect of the board reputation will be greater on the initial return in the case of high information asymmetry versus low information asymmetry.

2.3 Relationship between Signalling and Information Asymmetry

Ritter and Welch (2002) argued that issuing firms could reduce the level of ex-ante uncertainty through signalling, which in turn helps to lower

the level of information asymmetry surrounding the listing firm's issues. The literature has shown that the signalling variables chosen by the current study can help to reduce the level of information asymmetry in the IPO market by signalling the quality of the issuing firm. For instance, reputable underwriters can make estimations and reveal information regarding the issuing firms they underwrite. Consequently, this helps to reduce the informational asymmetry (Beckman, Garner, Marshall, & Okamura, 2001). Another example is the lock-up period which can be used to display information about the interest and confidence of pre-IPO shareholders on the future of the firm. The lock-up period can be used as a signal to reduce the information asymmetry surrounding the listing firm's issues (Mohd Rashid et al., 2014). Following this, Hearn (2013) argued that auditor's disclosures can also mitigate the level of information asymmetry surrounding the listing firm's issues by reducing the agency costs, thereby improving the relationship between the pre-IPO shareholders and the firm managers. Finally, board reputation is observed to reduce the level of information asymmetry surrounding listing firm's issues because of the board's effective monitoring mechanism in enhancing the value of the issuing firms, thereby maintaining their reputation (Certo et al. 2001; Yatim, 2011). Building on the previous discussion, the issuing firms can use the study signals to decrease the level of ex-ante uncertainty, hence reduce information asymmetry. Therefore, the present study hypothesises the following:

H_{1b}: Lock-up period has a negative relationship with after-market spread.

H_{2b}: Underwriter reputation has a negative relationship with after-market spread

H_{3b}: Auditor reputation has a negative relationship with after-market spread.

H_{4b}: Board reputation has a negative relationship with after-market spread.

3. Data and Methodology

The IPOs served as the focus of the present study. Prior to selecting them, it is worth mentioning that the Malaysian IPO market consists of unique types of issues, such as restricted offer-for-sale issue, restricted public issue, restricted offer-for-sale issue to eligible employees, restricted offer-for-sale issue to Bumiputera (Malays and indigenous

people) investors, special and restricted issues to Bumiputera investors, tender offers, and special issues. During the period of this study, from January 2000 to December 2015, 544 IPOs were reviewed. The samples comprised IPOs which fall under the following types of issues: public issues, private placements, and offer-for-sale issue, or a hybrid of any of these types of issues. The selection of the IPOs was based on Abdul-Rahim and Yong (2010), Yong (2007b), and Mohd Rashid et al. (2014). The final sample excluded those unique types of issues because they were not available for subscription by the public. This practice was in accordance to Abdul Rahim and Yong (2010) and Yong (2007b), who recommended that they be excluded from the samples so as to avoid un-meaningful outcomes.

The information used in this study was retrieved from various sources: (1) Bursa Malaysia website (http://www.bursamalaysia.com/initial-public-offerings/), (2) KLSE Info website (http://www.klse.info/counters/historical-prices/), (3) Yahoo Finance Singapore web-site (https://sg.finance.yahoo.com), and (4) the *Star Online* website (http://biz.thestar.com.my/marketwatch/ipo). The data for the over-subscription ratio were not readily available, hence we relied on various newspaper reports such as the *Star Online* (http://www.thestar.com/business/business-news), and one-million dollar blog (http://1-million-dollar-blog.com/category/stock-market/initial-public-offering).

The present study excluded the Real Estate Investment Trust (REIT) category since this type of issue consists of a different presentation format of financial statements (Mohd Rashid et al., 2014). A further twenty-seven IPOs which were extreme outliers were also excluded, using studentised residuals (Ruppert, 2004) and DFITS, and Cook's distance (Rahman, Sathik, & Kannan, 2012). These two approaches enable the simultaneous detection of both the extreme outliers and other influential observations. The rule of thumb for this procedure is to remove the outliers only if they are also influential since outliers will be able to influence the regression model only in such cases. Consequently, the final sample consisted of only 393 (420 – 27) IPOs. However, this study was unable to collect the data for the entire lot of 393 IPOs because the DataStream database was only able to provide the Bid/Ask spreads for 313 IPOs, hence the total number used comprised 313 only.

The first part of this study is to classify the study samples into two groups, based on company size, and board listing. Both are considered as control variables because of their ability to proxy the level of information asymmetry in the IPO market (Yung & Zender 2010; Yong 2015). Prior

to this, however, the relationship between the signalling variables and the IPO initial returns need to be investigated. This was achieved by using the 393 study sample. The process is necessary for ensuring that the effect of the signalling variable on the initial return is consistent, even after the study samples are segregated. The two sub-samples comprised of the low information asymmetry and the high information asymmetry. One sub-sample simulated an environment of high information asymmetry while the other sub-sample simulated an environment of low information asymmetry. The purpose of the segregation is to determine which signal serves as the most influential on the initial performance of the IPOs in an environment of high information asymmetry, as is exemplified by the Malaysian IPO market currently.

Two variables were utilised to segregate the study sample. The first variable was company size. This was calculated by multiplying the offer size of the issues with the closing price of the first day of listing (Chahine, Filatotchev, & Zahra, 2011; Chambers & Dimson, 2009). According to Yung and Zender (2010), the offer size can reflect the issuing firm's value, thus it can be used to construct a proxy to reflect the level of information asymmetry. The size-based sorting approach had been used by Agarwal, Liu, and Rhee (2008), while using company size as a proxy for information asymmetry had been utilised by Beatty and Ritter (1986), Barclay and Smith (1995), and Goergen, Renneboog and Khurshed (2006). They argued that company size is suitable because younger and smaller firms tend to be exposed to greater uncertainty. Therefore, the current study used the size of the issuing firms as the first variable, and two groups were assigned. The first group was composed of small issuing firms (< RM27m) which were assigned the small-sized portfolios (i.e. high asymmetric information portfolio). The second group comprised big issuing firms (> RM27m) which were assigned the large-sized portfolios (i.e. low asymmetric information portfolio).

The second variable used to segregate the study sample was firm's listing board. The listing board is believed to be a better proxy for capturing the level of information asymmetry in the Malaysian market because the listing board in the Malaysian IPO market is of two categories – the ACE Market and the Main Market. Yong (2015) emphasised that IPO firms that are on the ACE Market are deemed riskier than those on the Main Market because they tended to be more speculative in nature. Therefore, ACE Market firms are surrounded by a greater level of uncertainty. ACE Market firms have been comparatively small. They do not have sufficient tracking records information, and

such firms have difficulties in securing conventional sources of financing (Yong, 2015). Due to these characteristics, the IPOs listed on the ACE Market are very difficult to be valued; hence, they are exposed to greater valuation uncertainties. Bessembinder, Hao, and Zheng (2015) also associated younger, smaller, and growth-oriented firms to be of high uncertainty in their fundamental values, hence higher levels of information asymmetry. It is anticipated that segregation of the samples based on listing board would be more efficient at gauging the level of information asymmetry.

Equation (1) represents a cross-sectional regression model which is needed to identify the study signals that are more influential on the initial performance of the IPOs in an environment of high information asymmetry such as Malaysia.

$$IR = \alpha + \beta_1 LP_i + \beta_2 UR_i + \beta_3 AR_i + \beta_4 BR_i + \beta_5 OFFSZ_i + \beta_6 OSR_i + \beta_7 PRIV_i +$$
$$\beta_8 MKTCON_i + \varepsilon_i \qquad (1)$$

where *IR* is the initial return (offer-to-open), calculated by finding the difference between the opening price and offer price divided by the offer price during the first day of listing. *LP* is the lock-up period which is calculated by taking the natural log of the lock-up period for every IPO firm (in days). *UR* is the underwriter reputation, which is proxied by a dummy variable that takes a value of 1 if Big 5 and 0, otherwise. *AR* is the auditor reputation, which is proxied by a dummy variable that takes a value of 1 if Big 5 and 0, otherwise. In this regard, the third variable used in the current study are the underwriter's reputation and the auditor's reputation. Both were measured through the proportion of the number of issues an investment bank (auditing firm) has underwritten (audited) as lead manager (lead auditor). This method had been used by Jelic et al. (2001), and Dimovski et al. (2011) to measure the underwriter's reputation, and by King and Peng (2006), and Megginson and Weiss (1991) to measure the auditor's reputation. The fourth variable is board reputation or *BR*, which was proxied by the overall number of directorships held by the INED members. The present study focuses on the INED members because they can convey the quality of the issuing firms, which then leads to a reduction in IPO under-pricing as prospective investors tend to believe that the prestigious INEDs are well informed about the future of the issuing firms. Fama (1980) had argued that INEDs have an important role to play in monitoring the actions of the management, in providing valuable business networking and expert

knowledge for the management of the firm. It is thus argued that the higher the number of INED members on the board, the more reputable the board becomes.

Following the four signalling variables, the current study used four control variables. The first comprised *OFFSZ* as the natural log of the offer-size, which indicated the supply of the IPOs. The second was *OSR*, proxied by the over-subscription ratio, which was used as a measure of the investors' demand on IPOs because it can indicate the amount of times the IPO was oversubscribed. The third was *PRIV* which was the institutional investor involvement; it was represented by a dummy variable that takes the value of 1 to represent firms with private placement, and zero, otherwise. The fourth was *MKTCON* which was the market condition proxied by the EMAS Index which was a capitalisation weighted index. The index comprised the large and mid-cap constituents of the FTSE Bursa Malaysia 100 Index and the FTSE Bursa Malaysia Small Cap Index. The index was developed with a base value of 6000 as of March 31, 2006. Following Mahmood, Xia, Ali, Usman and Shahid (2011), the present study measured the contemporaneous market conditions on the listing date by using Equation (2) as follows:

$$MKTCON_{Listing} = (\frac{PI_{LISTING} - PI_{OFFER}}{PI_{OFFER}}) \tag{2}$$

where,

$PI_{LISTING}$ = EMAS Price Index on the day of listing, and

PI_{OFFER} = EMAS Price Index on the day of offerings.

The second part of this study is to investigate which of the study signals are able to reduce the level of information asymmetry around its issues. In an environment of high information asymmetry such as Malaysia, investors would need as much information as possible to help them identify high-quality issues for investment. On the other hand, issuing firms need to use reliable signals to reflect their quality to potential investors within a high information asymmetry market. Equation (3) thus enables this study to investigate which of the study signals is able to perform the function of reducing the level of infor-mation asymmetry around their issues by having a negative relationship with the spread, which was used to proxy the level of information asymmetry in the Malaysian market. The equation is as follows:

$$Spread_i = \alpha + \beta_1 LP_i + \beta_2 UR_i + \beta_3 AR_i + \beta_4 BR_i + \beta_5 FSize_i + \beta_6 LBoard_i + \varepsilon_i \tag{3}$$

where *Spread* is the average Bid/Ask spread of the ten days after the first day of IPO. *FSize* is the size of the issuing firm, which is represented by a dummy variable that takes 1 for (> RM27m) and 0 for others. *LBoard* is the listing board of the issuing firm, which is represented by a dummy variable that takes 1 for issues listed on the Main Market and 0 for others.

Armstrong, Core, Taylor, and Verrecchia (2011) reported that information asymmetry could be investigated through several accounting and market-based measurements which have been used in the literature including the Bid/Ask spread (Greenstein & Sami 1994; Armstrong et al., 2011), Probability of Informed Trade (PIN) (Easley, Hvidkjaer, & O'Hara, 2002; Boehmer, Grammig, & Theissen, 2007), news or media coverage (Duarte, Han, Harford, & Young, 2008), and analyst coverage (Armstrong et al., 2011). Of all these methods, it is argued that the Bid/Ask spread is the most reliable market-based measurement (Greenstein & Sami, 1994; Armstrong et al., 2011). It is further verified that the Bid/Ask spread is more superior in measuring information asymmetry (Leuz & Verrecchia, 2000; Yoon, Zo, & Ciganek, 2011).

Through Equation (1) and Equation (3), this study will be able to identify which signals in the Malaysian IPO market is capable of influencing the initial performance of the IPOs in an environment of high information asymmetry, as well as reducing the level of information asymmetry around the issues.

4. Results and Discussion

Table 1 presents the descriptive statistics derived from the calculation. They are based on the final samples of 393 IPOs. The average initial return of the IPOs is about 33.8 per cent. This value is slightly higher

Table 1: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Offer price (RM)	393	0.971	0.658	0.12	4.8
Opening price (RM)	393	1.277	0.970	0.17	7
Initial return (%)	393	33.755	41.143	-21.481	288.889
Company size (RM, million)	393	43.4	58.9	2.25	811.4
Offer size(Unit offered, million)	393	45.6	60.1	2.0	675.0
Over-subscription ratio (%)	393	33.627	50.291	-0.890	377.960
Market condition (%)	393	0.667	4.625	-20.001	12.986

than the 26.34 per cent average offer-to-open initial returns covering the period of 2001 to 2009 (Yong, 2011), the 29 per cent average initial returns covering the period of 2000 to 2012 (Mohd Rashid et al., 2014), the 30 per cent average initial returns covering the period of 2003 to 2008 (Abdul-Rahim, Sapian, Yong, & Auzairy, 2013), as well as the 30.83 per cent average initial returns for the period of 2000 to 2007 (Low & Yong, 2011).

4.1 Information Asymmetry Effect on the Relationship between Signalling Variables and Initial Returns

This section focuses on the effect of the information asymmetry on the main relationship between the four signalling variables and the initial performance of the IPOs. Table 2 shows the relationship between the signalling variables and the initial returns of the IPO using the entire study samples of 393 IPOs.

The results show that both the auditor reputation and board reputation have a significant negative relationship with under-pricing as signalling variables. Additionally, the listing board is found to have a significant negative relationship with the IPO's initial performance.

Table 2: Cross-sectional Regression Results for the Whole Study Sample (N=393)

Variable Dependent variable: Initial return (neglog)[a]	Coef.	t-statistics	p-value
Lock-up period (LN)	-0.004	-0.11	0.911
Big5 underwriters (D)	0.257	1.44	0.152
Big5 auditors (D)	-0.412	-2.53	0.012
Board reputation (D)	-0.256	-2.68	0.008
Company size (D)	0.125	0.71	0.478
Listing board (D)	-0.789	-4.69	0.000
Constant	3.872	11.15	0.000
Number of observations	393		
F-value	7.98**		
Adj. R-squared	0.087		

Notes: [a] The neglog is a transformation method proposed by Whittaker, Whitehead and Somers (2005) to handle the log transformation of negative values. D stands for dummy variable. LN stands for natural logarithm transformation method. ** Significant at the 1 per cent level.

This shows that the IPOs listed on the Main Market have lower under-pricing than IPOs listed on the ACE Market. The reason is that the level of information asymmetry around the Main Market is lower. However, this initial analysis is still unable to indicate whether the signalling variables of the study have the same influence on the initial performance of the IPOs when measured in different environments (High vs. Low information asymmetry environment). More is further discussed below.

4.1.1 Segregation of the Study Samples Based on the Market Capitalisation

As mentioned above, the study samples of 393 IPOs comprised two sub-samples based on the market capitalisation proxy. The first sub-sample is the large-sized issuing firms (environment of low information asymmetry) which comprise of 197 IPOs and the second sub-sample is the small-sized issuing firms (environment of high information asymmetry) which comprise of 196 IPOs. To further investigate the pronounce effect of the signalling variables within an environment of high level information asymmetry versus an environment of low level information asymmetry, the coefficients of each signalling variable for both environments were compared. Table 3 further illustrates.

The results indicate that the Big 5 reputable auditors have a coefficient of –0.427 in Panel B (with a t-statistics of –2.44, significant at the 1 per cent level). This is higher than the coefficient (–0.158) of the Big 5 reputable auditors in Panel A (with a t-statistics of –0.71, not significant). The coefficient results show that reputable auditors have a larger and more significant negative effect on initial returns when using the sample of high information asymmetry versus the sample of low information asymmetry. This outcome confirms H_{3a}. Furthermore, board reputation (with a coefficient of –0.013 in Panel A, and –0.384 in Panel B) has a higher-value coefficient in the sample for high information asymmetry rather than in the low information asymmetry. This confirms hypotheses H_{4a}.

The Big 5 reputable underwriters have a coefficient of 0.252 in Panel A, which is slightly higher than the Big 5 reputable underwriters coefficient of 0.216 in Panel B. The results contradict hypothesis H_{2a}. Furthermore, the lock-up period (with a coefficient of –0.075 in Panel A, and 0.041 in Panel B) shows a higher-value coefficient among the samples of low information asymmetry when compared to those of high information asymmetry. This also contradicts hypothesis H_{1a}.

Table 3: Cross-sectional Regression Results for Big IPO Firms (N=197) and Small IPO Firms (N=196)

Variable Dependent variable: Initial return (neglog)[a]	Panel A Large-sized issuing firms	Panel B Small-sized issuing firms
Lockup period (LN)	-0.075 (-1.87)	0.041 (0.69)
Big5 underwriters (D)	0.252 (1.13)	0.216 (1.14)
Big5 auditors (D)	-0.158 (-0.71)	-0.427 (-2.44)**
Board reputation	-0.013 (-0.12)	-0.384 (-3.27)**
Supply of IPOs (LN)	-0.926 (-4.77)**	-0.495 (-2.51)**
OSR (per cent)	0.011 (3.15)**	0.010 (5.86)**
Market conditions (neglog)	0.349 (4.65)**	0.272 (3.82)**
Private placement (D)	-0.409 (-1.45)	-0.261 (-1.25)
Constant	19.014 (5.57)**	11.413 (3.48)**
Number of observations	197	196
F-value	9.75**	10.59**
Adj. R-squared	0.377	0.331

Notes: [a] The neglog is a transformation method proposed by Whittaker et al. (2005) to handle the log transformation of negative values. D stands for dummy variable. LN stands for natural logarithm transformation method. t-statistics between brackets. ** Significant at the 1 per cent level.

4.1.2 Segregation of the Study Samples Based on the Listing Board

The Malaysian IPO market had previously consisted of three listing boards – the Main Board, Second Board, and MESDAQ. After August 2009, the Main Board and Second Board were merged into the Main Market, and MESDAQ was re-branded as the ACE Market. The categorisation of the listing board of the new issuing firms was based on the new

listing requirements after August 2009. This means that all of the IPOs before August 2009 would be categorised into the Main Market or ACE Market only. Based on the listing board, the segregated study samples consist of 259 IPOs in the Main Market and 134 IPOs in the ACE Market. Analysis of the data further indicates that all of the four signalling variables applied in the current study (lock-up period, underwriter reputation, auditor reputation, and board reputation) have scored a higher coefficient in the ACE Market samples than in the Main Market samples. Table 4 further presents.

Table 4: Cross-sectional Regression Results for IPOs Listed on Main Market (N=259) and ACE Market (N=134)

Variable Dependent variable: Initial return (neglog)[a]	Panel A Main Market	Panel B ACE Market
Lock-up period (LN)	-0.031 (-0.82)	-0.104 (-1.21)
Big5 underwriters (D)	0.170 0.92	0.291 (1.26)
Big5 auditors (D)	-0.153 (-0.86)	-0.665 (-2.80)**
Board reputation	-0.088 (-0.88)	-0.508 (-3.02)**
Supply of IPOs (LN)	-0.399 (-3.07)**	-0.223 (-0.97)
OSR (per cent)	0.017 (2.65)**	0.008 (5.63)**
Market conditions (neglog)	0.345 (5.84)**	0.237 (2.00)**
Private placement (D)	-0.475 (-2.38)	-0.330 (-0.70)
Constant	9.499 (4.14)**	8.536 (2.09)**
Number of observations	259	134
F-value	9.250**	4.660**
Adj. R-squared	0.321	0.295

Notes: [a] The neglog is a transformation method proposed by Whittaker et al. (2005) to handle the log transformation of negative values. D stands for dummy variable. LN stands for natural logarithm transformation method. t-statistics between brackets. ** Significant at the 1 per cent level.

The results confirm all the hypotheses of H_{1a}, H_{2a}, H_{3a} and H_{4a}. This indicates that the influence of the lock-up period, underwriter reputation, auditor reputation and board reputation on initial returns of the IPOs would be noticeable in the high information asymmetry environment rather than in the low information asymmetry environment. The results also show that the listing board proxy produces better outcomes than the market capitalisation proxy when segregating the study samples to measure the effect of information asymmetry on the relationship between the signalling variables and the initial returns. Building on the previous results of the two proxies, the current study suggests that the listing board proxy is a better measurement for information asymmetry in the Malaysian IPO market than the market capitalisation proxy. In an environment of low information asymmetry, the results show that all the four signalling variables do not influence the initial performance of the IPOs (see Panel A in Table 3 and Table 4). Underwriter reputation and auditor reputation are observed to have no significant relationship with the initial returns. This is because investors expect large-sized issuing firms to employ the best underwriter and the best auditing firm by default. The percentage of the issuing firms that have underwritten their issues using the Big 5 reputable underwriters is around 94 per cent, and the percentage of the issuing firms that have hired a Big 5 reputable auditor is around 80 per cent. In an environment of high information asymmetry, the results show that auditor reputation and board reputation influence the initial performance of the IPOs (see Panel B in Table 3 and Table 4). The results show that auditor reputation and board reputation have a significant negative relationship with initial returns of the IPOs. Beatty and Ritter (1986) found that IPO firms with less risk tended to hire Big Eight auditing firms, which helped in reducing under-pricing. Certo et al. (2001), and Cohen and Dean (2005) have documented that new issuing firms use multiple board memberships to signal their firms' quality, and this is likely to develop a negative relationship with the initial returns of the IPOs.

However, the lock-up period and underwriter reputation are observed to have no significant relationship with the initial returns in both analyses. Underwriter reputation signal does not show any sign of significance because the percentage of large-size and small-size issuing firms with reputable underwriters were 94 per cent and 90 per cent, respectively. This means that most of the new issuing firms have underwritten their issues by using reputable underwriters. This, in turn, has caused investors to overlook this signal as helpful information for

identifying good investment characteristics. Furthermore, the lock-up period is noted to have no significant relationship with initial returns because all the issuing firms had the same lock-up period (1 year before August 2009 and 6 months after August 2009). Consequently, prospective investors do not feel the need to pay any further attention to this particular information.

4.2 Relationship between Signalling and Information Asymmetry (spread)

The Big 5 underwriters show a significant negative relationship with the after-market spread. This outcome indicates that issues associated with prestigious underwriters could serve as a signal to prospective investors regarding the magnitude of risk associated with the issues, hence help to reduce information asymmetry around these issues. Paudyal, Saadouni and Briston (1998) had documented that long-term investments were significantly better for new issuing firms with prestigious underwriters than those with less reputable underwriters. Neuberger and Chapelle (1983) had divided these underwriters into three groups depending on their level of prestige in the market, and they concluded that prestigious underwriters reduced information asymmetry in the IPO market. Table 5 displays the results of the cross-sectional regression where equation (3) was applied.

Table 5: Cross-sectional Regression Results for (313 IPOs) Using Spread as the Dependent Variable

Variable Dependent variable: Spread	Coef.	t-statistic	p-value
Lock-up period (LN)	0.017839	1.64	0.101
Big5 underwriters (D)	-0.12994	-2.18	0.030
Big5 auditors (D)	0.080177	1.42	0.157
Board reputation	-0.05281	-1.72	0.087
Listing board (D)	-0.42531	-5.93	0.000
Firm size (D)	-0.16771	-2.78	0.006
Constant	1.585524	14.37	0.000
Number of observations	313		
F-value	14.64**		
Adjusted R-squared	0.2447		

Notes: D stands for dummy variable. LN stands for natural logarithm transformation method. ** Significant at the 1 per cent level.

The results shown in Table 5 indicate that board reputation has a significant relationship with after-market spread in a negative way. Fama (1980) had argued that INEDs can convey the quality of the issuing firms because they play an important role in monitoring the actions of the management, and in providing valuable business networking and expert knowledge for the firm's management. Based on this, board reputation is able to reduce the level of information asymmetry around its issues.

The lock-up period is found to have a significant relationship with the after-market spread in a positive way. In their study, Yung and Zender (2010) had concluded that when no correlation occurs between the lock-up period and the initial returns, it means that the length of the lock-up period had been used to solve the moral hazard problem. The results in Table 3 and Table 4 of the present study show that there is no correlation between the lock-up period, and the initial returns. This outcome indicates that the lock-up period has been used as a commitment device to reduce the moral hazard problems.

Specifically, Brav and Gompers (2003) argued that the lock-up period served as a precaution measurement against after-market insider actions. They also concluded that after-market insiders may not act in the best interest of the shareholders. Therefore, the lock-up period is implemented to convince the public that the insiders' ability to take advantage of shareholders has been reduced, hence public investors would be more willing to buy into the offering. Building on the previous argument, this study therefore concludes that the lock-up period in the Malaysian IPO market is not used to signal the quality of the issuing firms. Instead, it is used as a commitment device. For this reason, the lock-up period does not show a negative relationship with the spread.

Finally, auditor reputation does not make the cut. Rad and Embong (2014) had argued that the adoption of the IFRS in Malaysia is not that prevalent because for the IFRS to be adopted by accounting numbers and financial issues, strong legal enforcement needs to be implemented within Malaysia. Based on the results, it can be deduced that the current study is able to support two out of four hypotheses developed, which comprised hypothesis H_{2b}, and H_{4b}.

5. Conclusion and Implications

This study investigates the influencing effect of information asymmetry on the relationship between the signalling variables and the initial returns of Malaysian IPOs. This study has also investigated the influencing

effect of the signalling variables (i.e. underwriter reputation, auditor reputation, board reputation and lock-up period) on information asymmetry. The study samples comprised 393 IPOs listed on the Bursa Malaysia from January 2000 to December 2015. The results derived show that the listing board is a better proxy than market capitalisation for the level of information asymmetry. Further, the results indicate that the effect of the signalling variables on the initial performance of IPOs is more pronounced in an environment of high information asymmetry. Nonetheless, only two signals managed to reduce the initial performance of the IPOs in an environment of high information asymmetry – the auditor reputation and the board reputation. The results also show that underwriter reputation and board reputation have a negative relationship with the Bid/Ask spread. This implies that these signals can reduce the level of information asymmetry around their issues.

Board reputation which is represented by the independent non-executive board members in the board is able to reduce the under-pricing cost which the listing firm had to bear during listing. This is achieved by lowering the level of information asymmetry around its issues. This means that both the investors and the issuing firms should hold INEDs board members in high regard because they have the ability to signal to prospective investors the quality of the issuing firms, thereby reducing the level of information asymmetry surrounding the listing firms. Underwriter reputation is able to reduce the level of information asymmetry around its issues, but unable to influence the initial returns of IPOs due to the lack of competitive pressure among underwriters in the Malaysian market (Jelic et al., 2001). Auditor reputation is able to reduce the under-pricing cost around its issues but unable to reduce the level of information asymmetry around its issues. This has been documented by Hogan (1997) and Willenborg (1999) – both have noted a negative relationship between auditor reputation and initial returns because reputable auditors are able to reduce the cost of the initial purchases of securities. This is achieved by reducing the measurement error which was related to the issuing firm's expected earnings (Lennox, 1999). However, auditor reputation is unable to reduce the level of information asymmetry around its issues because it required a stronger legal enforcement (Rad & Embong, 2014). Finally, the results shows that the lock-up period is unable to reduce the level of information asymmetry and under-pricing around its issues. This is probably due to the mandatory regulations enforced on the new issuing firms with

regards to the lock-up period. This enforcement has probably led to the lock-up period to be used as a commitment device to protect investors (Yung & Zender, 2010).

References

Abdul-Rahim, R., & Yong, O. (2008). Initial returns of Shariah-compliant IPOs in Malaysia. *Capital Markets Review, 16*(2), 39–52.

Abdul-Rahim, R., & Yong, O. (2010). Initial returns of Malaysian IPOs and Shari'a compliant status. *Journal of Islamic Accounting and Business Research, 1*(1), 60–74. http://dx.doi.org/10.1108/17590811011033415

Abdul-Rahim, R., Sapian, R.Z.Z., Yong, O., & Auzairy, N.A. (2013). Flipping activity and subsequent after-market trading in Malaysian initial public offerings (IPOs). *Asian Academy of Management Journal of Accounting and Finance, 9*(1), 113–128.

Agarwal, S., Liu, C., & Rhee, S.G. (2008). Investor demand for IPOs and after-market performance: Evidence from the Hong Kong stock market. *Journal of International Financial Markets, Institutions and Money, 18*(2), 176–190. http://dx.doi.org/10.1016/j.intfin.2006.09.001

Akerlof, G.A. (1970). The market for "lemons": Quality uncertainty and the market mechanism. *Quarterly Journal of Economics, 84*(3), 488–500.

Allen, F., & Faulhaber, G.R. (1989). Signalling by under-pricing in the IPO market. *Journal of Financial Economics, 23*(2), 303–323. http://dx.doi.org/10.1016/0304-405X(89)90060-3

Armstrong, C.S., Core, J.E., Taylor, D.J., & Verrecchia, R.E. (2011). When does information asymmetry affect the cost of capital? *Journal of Accounting Research, 49*(1), 1–40. http://dx.doi.org/10.1111/j.1475-679X.2010.00391.x

Barclay, M.J., & Smith, C.W. (1995). The maturity structure of corporate debt. *Journal of Finance, 50*(2), 609–631. http://dx.doi.org/10.1111/j.1540-6261.1995.tb04797.x

Beatty, R.P., & Ritter, J.R. (1986). Investment banking, reputation, and the underpricing of initial public offerings. *Journal of Financial Economics, 15*(1-2), 213–232. http://dx.doi.org/10.1016/0304-405X(86)90055-3

Beckman, J., Garner, J., Marshall, B., & Okamura, H. (2001). The influence of underwriter reputation, keiretsu affiliation, and financial health on the under-pricing of Japanese IPOs. *Pacific-Basin Finance Journal, 9*(5), 513–534. http://dx.doi.org/10.1016/S0927-538X(01)00026-9

Bessembinder, H., Hao, J., & Zheng, K. (2015). Market making contracts, firm value, and the IPO decision. *Journal of Finance, 70*(5), 1997–2028. http://dx.doi.org/10.1111/jofi.12285

Boehmer, E., Grammig, J., & Theissen, E. (2007). Estimating the probability of informed trading—does trade misclassification matter? *Journal of Financial Markets, 10*(1), 26–47. http://dx.doi.org/10.1016/j.finmar.2006.07.002

Brav, A., & Gompers, P.A. (2003). The role of lock-ups in initial public offerings. *Review of Financial Studies, 16*(1), 1–29. http://dx.doi.org/10.1093/rfs/16.1.0001

Carter, R.B., & Manaster, S. (1990). Initial public offerings and underwriter reputation. *Journal of Finance, 45*(4), 1045–1067. http://dx.doi.org/10.1111/j.1540-6261.1990.tb02426.x

Certo, S.T., Daily, C.M., & Dalton, D.R. (2001). Signalling firm value through board structure: An investigation of initial public offerings. *Entrepreneurship Theory and Practice, 26*(2), 33–50. http://dx.doi.org/10.1177/104225870102600202

Chahine, S., Filatotchev, I., & Zahra, S.A. (2011). Building perceived quality of founder-involved IPO firms: Founders' effects on board selection and stock market performance. *Entrepreneurship Theory and Practice, 35*(2), 319–335. http://dx.doi.org/10.1111/j.1540-6520.2009.00361.x

Chambers, D., & Dimson, E. (2009). IPO under-pricing over the very long-run. *Journal of Finance, 64*(3), 1407–1443. http://dx.doi.org/10.1111/j.1540-6261.2009.01468.x

Chowdhry, B., & Sherman, A. (1996). International differences in over-subscription and under-pricing of IPOs. *Journal of Corporate Finance, 2*(4), 359–381. http://dx.doi.org/10.1016/0929-1199(96)00002-8

Claessens, S., Djankov, S., & Lang, L.H.P. (2000). The separation of ownership and control in East Asian corporations. *Journal of Financial Economics, 58*(1–2), 81–112. http://dx.doi.org/10.1016/S0304-405X(00)00067-2

Clarkson, P.M., Dontoh, A., Richardson, G., & Sefcik, S.E. (1991). Retained ownership and the valuation of initial public offerings: Canadian evidence. *Contemporary Accounting Research, 8*(1), 115–131. http://dx.doi.org/10.1111/j.1911-3846.1991.tb00838.x

Cohen, B.D., & Dean, T.J. (2005). Information asymmetry and investor valuation of IPOs: Top management team legitimacy as a capital market signal. *Strategic Management Journal, 26*(7), 683–690. http://dx.doi.org/10.1002/smj.463

Dimovski, W., Philavanh, S., & Brooks, R. (2011). Underwriter reputation and under-pricing: Evidence from the Australian IPO market. *Review of Quantitative Finance and Accounting, 37*(4), 409–426. http://dx.doi.org/10.1007/s11156-010-0211-2

Duarte, J., Han, X., Harford, J., & Young, L. (2008). Information asymmetry, information dissemination and the effect of regulation FD on the cost of capital. *Journal of Financial Economics, 87*(1), 24–44. http://dx.doi.org/10.1016/j.jfineco.2006.12.005

Easley, D., Hvidkjaer, S., & O'Hara, M. (2002). Is information risk a determinant of asset returns? *The Journal of Finance, 57*(5), 2185–2221. http://dx.doi.org/10.1111/1540-6261.00493

Fama, E.F. (1980). Agency problems and the theory of the firm. *Journal of Political Economy, 88*(2), 288–307.

Goergen, M., Renneboog, L., & Khurshed, A. (2006). Explaining the diversity in shareholder lock-up agreements. *Journal of Financial Intermediation, 15*(2), 254–280. http://dx.doi.org/10.1016/j.jfi.2005.10.001

Greenstein, M.M., & Sami, H. (1994). The impact of the SEC's segment disclosure requirement on Bid/Ask spreads. *The Accounting Review, 69*(1), 179–199.

Grinblatt, M., & Hwang, C.-Y. (1989). Signalling and the pricing of new issues. *Journal of Finance, 44*(2), 393–420. http://dx.doi.org/10.1111/j.1540-6261. 1989.tb05063.x

Habib, M.A., & Ljungqvist, A.P. (2001). Under-pricing and entrepreneurial wealth losses in IPOs: Theory and evidence. *Review of Financial Studies, 14*(2), 433–458. http://dx.doi.org/10.1093/rfs/14.2.433

Hearn, B. (2013). The determinants of IPO firm prospectus length in Africa. *Review of Development Finance, 3*(2), 84–98. http://dx.doi.org/10.1016/j.rdf. 2013.04.002

Hemmer, H.R., & Bardhan, P. (2000). Understanding under-development: Challenges for institutional economics from the point of view of poor countries. *Journal of Institutional and Theoretical Economics/Zeitschrift Fur Die Gesamte Staatswissenschaft, 156*(1), 216–235.

Hogan, C.E. (1997). Costs and benefits of audit quality in the IPO market: A self-selection analysis. *Accounting Review, 72*(1), 67-86.

Jelic, R., Saadouni, B., & Briston, R. (2001). Performance of Malaysian IPOs: Underwriters reputation and management earnings forecasts. *Pacific-Basin Finance Journal, 9*(5), 457–486. http://dx.doi.org/10.1016/S0927-538X(01)00013-0

Keasey, K., & Short, H. (1997). Equity retention and initial public offerings: The influence of signalling and entrenchment effects. *Applied Financial Economics, 7*(1), 75–85. http://dx.doi.org/10.1080/096031097333862

Kenourgios, D.F., Papathanasiou, S., & Rafail Melas, R. (2007). Initial performance of Greek IPOs, underwriter's reputation and over-subscription. *Managerial Finance, 33*(5), 332–343. http://dx.doi.org/ 10.1108/ 03074350710739614

King, R., & Peng, W.Q. (2006). *Does the reputation of independent non-executive directors' matter: Evidence from Hong Kong* (Doctorol thesis, Hong Kong University of Science and Technology).

La Porta, R., Lopez-de Silanes, F., Shleifer, A., & Vishny, R. (2000). Investor protection and corporate governance. *Journal of Financial Economics, 58*(1-2), 3–27. http://dx.doi.org/10.1016/S0304-405X(00)00065-9

Leland, H.E., & Pyle, D.H. (1977). Informational asymmetries, financial structure, and financial intermediation. *Journal of Finance, 32*(2), 371–387. http://dx.doi.org/10.2307/2326770

Lennox, C.S. (1999). Audit quality and auditor size: An evaluation of reputation and deep pockets hypotheses. *Journal of Business Finance and Accounting 26*(7-8), 779–805. http://dx.doi.org/10.1111/1468-5957.00275

Leuz, C., & Verrecchia, R.E. (2000). The economic consequences of increased disclosure. *Journal of Accounting Research, 38*(3), 91-124. http://dx.doi.org/10.2307/2672910

Low, S.W., & Yong, O. (2011). Explaining over-subscription in fixed-price IPOs: Evidence from the Malaysian stock market. *Emerging Markets Review, 12*(3), 205–216. http://dx.doi.org/10.1016/j.ememar.2011.03.003

Mahmood, F., Xia, X., Ali, M., Usman, M., & Shahid, H. (2011). How Asian and global economic crises prevail in Chinese IPO and stock market efficiency. *International Business Research, 4*(2): 226–237. http://dx.doi.org/10.5539/ibr.v4n2p226

Megginson, W.L., & Weiss, K.A. (1991). Venture capitalist certification in initial public offerings. *Journal of Finance, 46*(3), 879–903. http://dx.doi.org/10.1111/j.1540-6261.1991.tb03770.x

Michaely, R., & Shaw, W.H. (1994). The pricing of initial public offerings: Tests of adverse-selection and signalling theories. *Review of Financial Studies, 7*(2), 279–319. http://dx.doi.org/10.1093/rfs/7.2.279

Michaely, R., & Shaw, W.H. (1995). Does the choice of auditor convey quality in an initial public offering? *Financial Management, 24*(4), 15–30. http://dx.doi.org/ 10.2307/3665948

Mohd Rashid, R., Abdul-Rahim, R., & Yong, O. (2014). The influence of lock-up provisions on IPO initial returns: Evidence from an emerging market. *Economic Systems, 38*(4), 487–501. http://dx.doi.org/10.1016/j.ecosys.2014.03.003

Neuberger, B.M., & La Chapelle. (1983). Unseasoned new issue price performance on three tiers: 1975-1980. *Financial Management, 12*(3), 23–28. http://dx.doi.org/10.2307/3665513

Paudyal, K., Saadouni, B., & Briston, R.J. (1998). Privatisation initial public offerings in Malaysia: Initial premium and long-term performance. *Pacific-Basin Finance Journal, 6*(5), 427–451. http://dx.doi.org/10.1016/S0927-538X (98)00018-3

Rad, S.S.E., & Embong, Z. (2014). IFRS adoption and information quality: Evidence from emerging market. *Asian Journal of Accounting and Governance, 5*(1), 37–45. http://dx.doi.org/10.17576/ajag-2014-5-8755

Rahman, S.M.A.K., Sathik, M.M., & Kannan, K.S. (2012). Multiple linear regression models in outlier detection. *International Journal of Research in Computer Science, 2*(2), 23–28.

Ritter, J.R., & Welch, I. (2002). A review of IPO activity, pricing, and allocations. *Journal of Finance, 57*(4), 1795–1828. http://dx.doi.org/10.1111/1540-6261.00478

Rock, K. (1986). Why new issues are under-priced. *Journal of Financial Economics, 15*(1–2), 187–212. http://dx.doi.org/10.1016/0304-405X(86)90054-1

Ruppert, D. (2004). *Statistics and finance: An introduction*. New York, NY: Springer.

Spence, M. (1973). Job market signalling. *Quarterly Journal of Economics, 87*(3): 355–374. http://dx.doi.org/10.2307/1882010

Spence, M. (1976). Informational aspects of market structure: An introduction. Quarterly Journal of Economics, 90(4), 591–597.

Warrington College of Business. (n.d.). *IPO data*. Retrieved from https://site. warrington.ufl.edu/ritter/ipo-data/

Welch, I. (1989). Seasoned offerings, imitation costs, and the under-pricing of initial public offerings. *Journal of Finance, 44*(2), 421–449. http://dx.doi. org/10.1111/j.1540-6261.1989.tb05064.x

Whittaker, J., Whitehead, C., & Somers, M. (2005). The neglog transformation and quantile regression for the analysis of a large credit scoring database. *Applied Statistics, 54*(5), 863–878. http://dx.doi.org/10.1111/j.1467-9876. 2005.00520.x

Willenborg, M. (1999). Empirical analysis of the economic demand for auditing in the initial public offerings market. *Journal of Accounting Research, 37*(1), 225–238. http://dx.doi.org/10.2307/2491405

Yatim, P. (2011). Under-pricing and board structures: An investigation of Malaysian initial public offerings (IPOs). *Asian Academy of Management Journal of Accounting and Finance, 7*(1), 73–93.

Yong, O. (2007a). A review of IPO research in Asia: What's next? *Pacific-Basin Finance Journal, 15*(3), 253–275. http://dx.doi.org/10.1016/j.pacfin.2006. 09.001

Yong, O. (2007b). Investor demand, size effect and performance of Malaysian initial public offerings: Evidence from post-1997 financial crisis. *Jurnal Pengurusan, 26*(1), 25–47.

Yong, O. (2011). Winner's curse and bandwagon effect in Malaysian IPOs: Evidence from 2001-2009. *Jurnal Pengurusan, 32*(1), 21–26.

Yong, O. (2015). What is the "true" value of an initial public offering? *Journal of Scientific Research and Development, 2*(10), 78–85.

Yoon, H., Zo, H., & Ciganek, A.P. (2011). Does XBRL adoption reduce information asymmetry? *Journal of Business Research, 64*(2), 157–163. http://dx.doi. org/10.1016/j.jbusres.2010.01.008

Yung, C., & Zender, J.F. (2010). Moral hazard, asymmetric information and IPO lock-ups. *Journal of Corporate Finance, 16*(3), 320–332. http://dx.doi. org/10.1016/j.jcorpfin.2009.12.004

Zhang, X., Zhang, M., Huang, S., & Zhou, Y. (2015). Heterogeneous expectations, IPO under-pricing and issuing mechanism. *Financial Innovation, 1*(11), 1–14. http://dx.doi.org/10.1186/s40854-015-0008-3