



## **Heterogeneity of Opinion, Shareholder Retention Ratio and Lockup Period: Malaysian Evidence**

ALI ALBADA<sup>a</sup>, LOW SOO-WAH<sup>b</sup>, OTHMAN YONG<sup>b</sup>, ANNUAR MD NASSIR<sup>a</sup>,  
FAKARUDIN KAMARUDIN<sup>c\*</sup> AND NAZRATUL AINA MOHAMAD ANWAR<sup>d</sup>

<sup>a</sup>*Xiamen University Malaysia*

<sup>b</sup>*Universiti Kebangsaan Malaysia, Malaysia*

<sup>c</sup>*Universiti Putra Malaysia, Malaysia*

<sup>d</sup>*Universiti Sains Islam Malaysia, Malaysia*

### **ABSTRACT**

This paper examines the effects of the lock-up period and shareholder retention ratio on the heterogeneity of investors beliefs regarding the true value of IPOs in the Malaysian IPO market. The relationship between the signalling variables and the first-day price range of IPOs is examined using a quantile regression (QR) technique. This study employs a sample of 377 IPOs issued between January 2000 and December 2015. The results show that shareholder retention ratio has a significant negative relationship with the first-day price range, while the lock-up period does not have a significant relationship with the first-day price range. This suggests that prospective investors acknowledge the importance of the shareholder retention ratio as a signal and use the information conveyed by this signal to evaluate the price of the listing firm's IPO and to ensure that the current price reflects their beliefs and expectations of the firm in general and the issue price in particular. Finally, the lock-up in the Malaysian market serves as precautionary measure to guard the investors against after-market insiders' actions.

**JEL Classification:** G32, G34

**Keywords:** Initial public offerings; Signalling; Lock-up period; Shareholder retention ratio; Heterogeneity of opinion; Quantile regression.

---

*Article history:*

Received: 10 December 2018

Accepted: 3 June 2019

---

---

\* Corresponding author: Email: [fakarudin@upm.edu.my](mailto:fakarudin@upm.edu.my)

## INTRODUCTION

Heterogeneity of opinion is a phenomenon commonly referred to the difference in investors' valuation regarding the true value of the listing firm's issues (Wang and Liu, 2014; Miller, 1977). According to Kandel and Pearson (1995), each investor has his/her own prior belief and expectation regarding the true value of the listing firm's issues because they evaluate the information available to them differently (Hong and Stein, 2007; Fama and French, 2007), which lead to heterogeneity of opinion among prospective investors regarding the true value of the listing firm's issues (Yong and Albada, 2018; Yong, 2015; Low and Yong, 2013). Beatty and Ritter (1986) argued that ex-ante uncertainty is the main cause of heterogeneity of opinion. Furthermore, Vega (2006) documented that the disagreement between prospective investors regarding the true value of the issues is caused by the ex-ante information, which leads to a higher drift in the price of the listing firm. According to Daniel et al. (2002), the stability of the market efficiency is disrupted by investors' heterogeneity of opinion because this heterogeneity influences the demand and supply forces of financial assets and causes the assets prices to deviate from their fair fundamental value. Therefore, attention to investors' heterogeneity of opinion is important due to its ability to influence the asset price formations and return generations (Tuyon and Ahmad, 2017).

Furthermore, this heterogeneity of opinion is inflated in the Malaysian IPO market because of the reliance on the fixed-price mechanism in setting the offer price of the listing firm's issues. The fixed-price method is one of the most common mechanisms used for pricing IPOs in Malaysia (Low and Yong, 2013; Yong, 2015). This pricing method plays a significant role in increasing investors' heterogeneity of opinion because the fixed-priced mechanism does not take into consideration investors' valuations and expectations regarding the true value of the issue (Low and Yong, 2013). Moreover, Chowdhry and Sherman (1996) documented that most of the Asian IPO markets that employed the fixed-price mechanism had more extreme under-pricing than countries that used the book-building and auction offerings methods. Finally, Badru and Ahmad-Zaluki (2018) reported that the ex-ante uncertainty in Malaysia is high due to the fixed-price mechanism, which leads to a higher under-pricing because of the high level of mispricing. This means, the higher the heterogeneity of opinion, the higher the level of IPO under-pricing.

Neglecting prospective investors' opinions and beliefs in determining the offer price lead to an increase in the level of heterogeneity around the listing firm's issues (Yong, 2015; Mohd Rashid et al., 2014). In contrast, the book-building and auction offering methods allow prospective investors to have a say in the valuation process (Yong and Albada, 2018; Yong, 2015). Zhang et al. (2015) concluded that under-pricing is much lower under the book-building than the fixed-price mechanism because the level of non-homogenous expectations among prospective investors is higher under the fixed-price method, which leads to a higher under-pricing. Furthermore, Yong (2015) came to the same conclusion regarding the use of the fixed-price method in Malaysia. He argued that the fixed-price method, which provides no opportunity for investors to reveal their private valuations of the new issue, have a higher heterogeneity of opinion than other pricing mechanisms such as book-building and auction offerings. Finally, Chahine (2007) finds that investors' divergence of opinion is lower in the book-building IPOs than in the fixed-price IPOs.

Building on the previous arguments, we can conclude that heterogeneity of opinion in the Malaysian IPO market is stemmed from the inability of prospective investors to reach consensus regarding the true value of the listing firm's issues because of the fixed-price method where the beliefs and expectations of prospective investors are not included in the offer price, leading investor to interpret the available ex-ante information differently. Furthermore, the heterogeneity of opinion (ex-ante uncertainty) among investors regarding the true value of an IPO has important behavioural implications, which in turn affect the initial performance of IPOs (Miller 1977; Goldberg & Nitzsch 2001). According to Yong (2015), these behavioural implications are presented by the willingness of prospective investors to buy or sell the IPO, which will be affecting the trading price range. This trading price range can be investigated by the first-day price range (Yong 2015; Low & Yong 2013). Specifically, the current study uses Low and Yong (2013) definition to represent the first-day price range, which is the difference between the maximum price and minimum price during the first-day of trading, divided by the closing price of the first-day of trading.

Ritter and Welch (2002) argued that some of the ex-ante information available to the public is able to reduce the heterogeneity of opinion by signalling the quality of the issuing firm to the market. The present study is interested in two ex-ante information, which are the shareholder retention ratio and lock-up period. Specifically, we are interested in investigating the influencing effect of both signals on investors' heterogeneity of opinion and IPO initial return in the Malaysian market. The focus on the lock-up period and shareholder retention ratio is stemmed from the lack of research in such areas in developing countries, especially in the case of Malaysia. Wan-Hussin (2005), Mohd Rashid et al. (2014), and Albada et al. (2018) argued that there has not been enough empirical attention on the lock-up period in Malaysia, even though there is a huge emphasis on the lock-up period by the Securities Commission (SC) in Malaysia. Furthermore, shareholder retention has received a very little attention, even in the developed markets (Bradley & Jordan 2002; Wong et al. 2013; Zheng et al. 2005; Albada et al. 2018). Due to this lack of research in this field, the validity of the relationship in a developing market, such as Malaysia, remains relatively unexplored in the existing body of literature. Moreover, the majority of the Malaysian literature (i.e. Wan-Hussin 2005; Mohd Rashid et al. 2014; and Albada et al. 2018) has focused on investigating the signalling effect of the lock-up period and shareholder retention ratio on under-pricing. However, the relationship between the two signals and investors' heterogeneity of opinion is still unexplored. By doing so, the current study extends the work of Mohd Rashid et al. (2014) and Albada et al. (2018) through investigating the influencing effect of lock-up period and shareholder retention ratio on investor's heterogeneity of opinion in the Malaysian IPO market. Moreover, Yong & Albada (2018), Yong (2015), and Low and Yong (2013) have investigated the influencing effect of IPO initial return on investors' heterogeneity of opinion in Malaysia. However, none of the previous studies have considered investigating the signalling effect on investors' heterogeneity of opinion, in particular the two signalling variables shareholder retention ratio and lock-up period.

The present study, further differentiates itself from the previous literature by implementing the quantile regression (QR) method in addition to the ordinary least square (OLS) method. We have selected the QR method due to its ability to overcome the OLS method in the case of non-normality of the data and heteroscedasticity, and it is robust to outliers due to the ability of the QR to explain the low and high of the dependent variable (Badru and Ahmad-Zaluki 2018). This is can be done through the quantile representation (e.g. 25th, 50th and 75th) of the dependent variable distribution. Furthermore, the QR method allows us to investigate the "influencing effect" of the independent variables at different points of the distribution of the dependent variable (Badru and Ahmad-Zaluki 2018). The results for the normality of the residuals through the Shapiro-Wilk W test show a p-value  $< 0.01$ , therefore rejecting the null hypothesis of the normal distribution for both the first-day price range and the initial return. Moreover, Table 1 and Figure 1 shows the variations in the mean, maximum and minimum values of the first-day price range and initial return.

This paper is organised as follows. Following the introduction section, section two discusses the literature and section three presents the data and methodology employed. The results are presented in section four and section five concludes the paper.

## **LITERATURE REVIEW**

The most prominent explanation and the one with the most empirical support is that IPO under-pricing occurs because of information asymmetry. The concept behind information asymmetry is built on the premise that under-pricing is a product of information disparities. The IPO process consists of three major players, which are the prospective investors, the issuing firm, and the lead investment banker that underwrites the issues of the issuing firm. The insiders of the issuing firm (pre-IPO shareholders) are most knowledgeable about the future of the issuing firm because they have detailed information regarding the future cash flows, managerial skills, investment opportunities, and the ability of the firm to control future agency costs and market potential. This information according to Garfinkel (1993) is seen as favourable private information that only known by the insiders of the issuing firm, and such private information is considered essential for investors, because it may help in evaluating the issuing firm. However, prospective investors do not have access to such private

information, which make them uncertain regarding the future of the issuing firm and hesitant in investing in such an unknown investment. Therefore, investors in the IPO market can disclose some amount of information regarding the value of the issuing firm through publicly disclosed information provided by the prospectus.

Beatty and Ritter (1986) described the information available to the public through the prospectus as ex-ante information. Furthermore, Beatty and Ritter (1986) argued that the available ex-ante information leads to uncertainty regarding the value of the issuing firm among prospective investors because each investor can draw its own conclusion regarding the value of the issuing firm based on how the investor interpret the available ex-ante information. Finally, they concluded the presence of ex-ante uncertainty among prospective investors influences the level of IPO under-pricing or the degree of price drift for the new issues.

Rock's (1986) model could also explain investors' heterogeneity of opinion. Rock argued that the existence of information asymmetry between the informed and uninformed investors, where the former is better informed about the fair value of IPO shares than the latter. This situation will provide the informed investor with the upper hand over the uninformed investor to invest in only under-priced issues and stay away from overpriced issues. On the other hand, the uninformed investor is bidding randomly against all the available issues. This results in under-priced issues receiving bidding from both informed and uninformed investors, while overpriced issues receiving bidding from only uninformed investors. This means that uninformed investors have a lower probability of receiving under-priced issues in comparison to overpriced issues, which results in the winner's curse problem. This lead Rock (1986) to conclude that as a result of the unfairness in the market, uninformed investors will become hesitant and may lead them to withdraw from the market due to the bias in allocation. Furthermore, Rock's (1986) model concluded that the under-pricing occurs to compensate uninformed investors for this bias in the allocation and thus keep them in the market. Yong (2011) documented that the under-pricing in the Malaysian market is partially caused by the existence of the winner's curse in the Malaysian IPO market, which contributes to increasing investors' heterogeneity of opinion.

Another explanation for investors' heterogeneity of opinion is provided by Welch's (1992) bandwagon effect, which is built based on Rock's (1986) model. According to Welch (1992), in deciding whether or not to subscribe to IPO shares, potential investors make decisions not only based on their personal information but also on the subscription decisions of other well-informed investors. An information cascade will form when investors make their decisions by observing the decisions or choices of others even though they themselves have favourable information. In other words, investors are not interested to invest in an IPO share that other investors do not wish to buy even if they possess favourable information about the new issue (Ljungqvist, 2008). With fixed-price IPOs, the information cascade model implies that to entice investors to invest in the IPO market, an issuer may have to under-price their issues to kick-start the IPO demand and later induce a cascade when subsequent investors disregard their personal information in favour of their observation based on earlier investors' purchase decisions. Moreover, Yong (2011) documented that the level of under-pricing would become higher for issues subscribed by a larger proportion of institutional investors (informed investors). Thus, issues with a larger proportion of institutional investors will have higher investors' heterogeneity of opinion.

The signalling theory has provided a solution to the information asymmetry dilemma, by communicating the superior quality of the listing firm to potential investors. This means that the information related to the lock-up period and shareholder retention ratio helps investors in formulating a consensus opinion regarding the true value of the listing firm's issues. This is due to the ability of both the lock-up period and shareholder retention ratio to convey valuable information regarding the listing firm's quality and future to outside investors. This would help in reducing the level of information asymmetry surrounding the new issues. The literature has shown that shareholder retention ratio (Clarkson et al., 1991; Leland and Pyle, 1977; Ritter and Welch, 2002) and lock-up period (Mohd Rashid et al., 2014) can reduce the level of information asymmetry in the IPO market through signalling the quality of the new issuing firm. However, the lock-up period in the Malaysian IPO market is heavily regulated, where the new issuing firms do not have the pleasure of choosing the period of the lock-up period which is one year period before 2009 and six months period after 2009 or even the choice of implementing the lock-up period or not. For that reason, the current study aims to investigate if the lock-up period still holds any relationship with the initial return and investor's heterogeneity of opinion due to the mandatory regulatory put forth by the SC in the Malaysian market. The study predicts that the signalling role of

the lock-up period is not available in the Malaysian market due to the enforced regulation put forth on the lock-up period. Finally the study argues that the issuing firm can use shareholder retention ratio to reduce the ex-ante uncertainty that surrounds the listing firm's issues through lowering the level of heterogeneity of opinion among IPO investors.

### **Signalling**

The signalling theory is built around the assumption of the presence of information asymmetry between the main three players of the IPO process, which are the issuer, the prospective investors, and the investment bank. This information asymmetry is caused by the inability of the issuing firm to signify its quality and prospect to the market because of its newness to the market. On the other hand, prospective investors are unable to identify the quality of the new listing firm due to the huge bundle of information available to them through the prospectus. Such information asymmetry led to the development of various models which attempted to explain the sources and the causes of the information asymmetry. For example, Rock's (1986) model that discusses the availability of two classes of investors namely the informed and uninformed investors, the bandwagon effect of Welch's (1992) model which argued that investors react to the decisions or choices of others even though they themselves have favourable information. These assumptions build the path for the signalling theory that argues that prospective investors and issuers in the market can identify some ex-ante information that is able to help prospective investors to identify good investment decisions and issuers can signify their quality through such information. According to the literature, the lock-up period is an appropriate signal of the listing firm's quality (Mohd Rashid et al., 2014). Shareholder retention ratio is also considered to be a good signal of the issuing firm quality because the insiders of the issuing firm have a much clearer knowledge of the future cash flows of the firm than the outside investors (Leland and Pyle 1977). Furthermore, the literature has shown the ability of shareholder retention ratio (Clarkson et al., 1991; Leland and Pyle, 1977; Ritter and Welch, 2002) and lock-up period (Mohd Rashid et al., 2014) in reducing the level of information asymmetry surrounding the listing firm's issues.

According to Michaely and Shaw (1994), issuing firms use signalling as a tool to reduce agency costs through conveying message that they are too costly for low-quality firms to imitate. In the case of shareholder retention ratio, the higher the level of shares retained by insiders, the higher the cost they would have to bear in regard to the additional non-diversifiable risk that they must shoulder (Leland and Pyle, 1977). Moreover, the lock-up period imposes an enormous cost on insiders. This is because insiders hold undiversified portfolios that consist mainly of their firm's issue, and the longer the period is, the higher the price will become (Courteau, 1995).

Finally, Butler et al. (2014) argued that the ex-ante information that is available to prospective investors through the prospectus can affect the initial price of the IPOs through reducing the ex-ante uncertainty. They reported that most of the variations in the initial return could be traced back to ex-ante information, which the market has access to before the listing date. Accordingly, the current study shows that the signalling variables are able to reduce the level of information asymmetry between the listing firm and the market, suggesting those signals will also be able to reduce the divergence of prospective investors' opinions regarding the true value of the listing firms' issues. This is because shareholder retention ratio and lock-up period are able to signify the quality and the beliefs of the insiders of the listing firm's future growth. Additionally, according to Mohd Rashid et al. (2014) the high level of information asymmetry in the Malaysian IPO market provides a suitable setting to investigate the role of the signalling variables.

### **Lock-up period in Malaysia**

The lock-up period prohibits insiders from selling their shares for a specified period following the IPO exercise. The lock-up period is a standard feature of IPOs and it is negotiated between the investment banker and the insiders of the issuing firm. The law does not require a lock-up period agreement. The time range of the lock-up period varies considerably and may last as long as three years, but the most common period is around 180 days (Allen and Faulhaber, 1989; Mohan and Chen, 2002; Brav and Gompers, 2003). In the case of Malaysia, the lock-up (share moratorium) agreement was made mandatory for particular new issuers in the Malaysian market

starting from May 3, 1999.<sup>1</sup> In subsequent years, the IPO agreement went through several amendments, with significant changes in the lock-up agreement occurring in 2003, 2008, and 2009. However, the revisions of 2009 were the most limited and vigilant on the lock-up agreement, in which most of these changes were made to protect investors' interests.<sup>2</sup> This means that all listing firms from 1999 to 2009 have a mandatory 1 year lock-up period and listing firms after 2009 have a mandatory 6 months lock-up period. Such enforcement of the lock-up agreement differentiates the Malaysian IPO market from the rest of the world, especially from the US and UK IPO markets. In developed countries, the implementation of the lock-up agreement is built on an optional basis that depends on the outcomes of the negotiations between the insiders of the IPO companies and the investment bank (Mohan and Chen, 2002; Brav and Gompers, 2003). According to Wan-Hussin (2005), there has not been enough empirical attention on the lock-up period in Malaysia, even though there is a huge emphasis on the lock-up period by the Malaysian Securities Commission.

### Control variables

The main interest of the current study is to investigate the relationship between the signalling variables and the first-day price range. For the study to be able to capture the full effects of shareholder retention ratio and lock-up period there is a need to control for the effects of other unique variables that have been identified by the literature, especially in the Malaysian market. The most relevant past studies to the present work are those by Yong and Albada (2018), Yong (2015), and Low and Yong (2013). Yong (2015) investigated the influencing effect of investor heterogeneity on listing board, the ratio of the first-day volume over total unit offered and IPO under-pricing. He concluded that IPOs that are characterised by high first-day trading volume, listed on the ACE Market, and high initial return have a higher level of divergence of opinion due to their speculative nature. Low and Yong (2013) documented that IPOs that are highly under-priced, have smaller offering size and listed on the MESDAQ Market tend to have a high level of heterogeneous beliefs among investors. Finally, Yong and Albada (2018) found that the level of under-pricing, together with control variable listing board (ACE Market vs. Main Market) can explain 50.7 per cent of the variation in the heterogeneity of opinion regarding the value of Malaysian fixed-price IPOs. This study differentiates itself from the previous literature by investigating the relationship between the signalling variable (i.e. shareholder retention ratio and lock-up period) and the first-day price range and employs a longer study period that starts from January 2004 until December 2015.

To capture the full effects of the prestige signals on the first-day price range and initial return the current study considers the following variables as control variables, which are the offer price, initial return, supply of IPOs, over-subscription ratio, private placement, market conditions and underwriter reputation. Yong and Albada (2018), Yong (2015), and Low and Yong (2013) documented a significant relationship between under-pricing and the first-day price range. They argued that higher under-pricing leads to higher investors' heterogeneous of opinion. According to Ritter (1984), the under-pricing arises as an equilibrium condition to induce investors to participate in the IPO market. Furthermore, according to Lowry and Schwert (2002), IPO under-pricing can be considered as prior IPO-specific information or can be considered as a new information as soon as it becomes available in the secondary market when the IPO starts trading.

The over-subscription ration is a unique feature of the fixed-price method because it is the only available indicator available to the issuer to gauge investors pre-demand (Low and Yong 2011). This situation is the opposite of the book-built pricing method, where the investors are solicited by the issuers before the offer prices are set up (Zheng et al., 2005; Yong, 2015). Furthermore, the over-subscription ratio is also included as a control variable because both Yong (2015) and Low and Yong (2013) concluded that the higher the over-subscription ratio the higher the investor's heterogeneity of opinion.

<sup>1</sup> According to the Securities Commission Act of 1999, promoters (original shareholders) that seeking listing on the Main Board and Second Board are not allowed to sell off more than 45% of the issues offered for a period of one year from the date of listing. Furthermore, the same rule applies on the promoters seeking listing on the MESDAQ. However, the promoters are required to hold at least 51% off the offered issues.

<sup>2</sup> According to the Securities Commission Act of 1999, firms listed on the Main Market and on the ACE market are required to lock-up 45% of the promoters' shares for six months period. After that, the promoters have the ability to retire 1/3 of the 45% locked shares per year provided that the listing firm has provided the audited operating revenue for one full financial year. This means that 45% of the promoters' shares are locked indefinitely until the firm is able to provide the one full financial year of audited operating revenue.

Another feature of the fixed-priced method is the offer price (Low and Yong, 2013). This because the offer price does not reflect the beliefs and expectations of prospective investors, which led the offer price to be discounted in order to neutralize the potential adverse effect of weak early investor interest (Benveniste and Busaba, 1997). Moreover, according to Benveniste and Busaba (1997) the price of the fixed-price issue should adjust in the immediate after-market to incorporate such information. Thus, if the offer price is set too high, investor's heterogeneity of opinion is expected to be higher. Finally, the offer price of the fixed-price mechanism is unique in comparison to the book-building and auction offering methods, where both of them incorporate the beliefs of investors by providing them with the incentive to put forward bids that reveal their expectations about the IPO issue price (Benveniste and Spindt, 1989; Biais et al., 2002; Derrien and Womack, 2003; Chahine, 2007).

It has been established that the Malaysian IPO market does suffer from the bandwagon effect as documented by Yong (2011). Therefore, the current study considers the private placement as control variable, where the private placement enables us to analyse the performance of IPOs based on the presence of knowledgeable or informed investors, as represented by the institutional investors.

The current study also controls for the effect of the market condition using the EMAS Index since it provides a wider coverage of the market than the commonly used FTSE KLCI index. According to Ritter (1984), in bullish market condition, initial returns tend to be high because of high market confidence as reflected in high stock prices, market volume, and high value of the stock market index. The opposite is true when the market is in a bearish condition. Furthermore, market conditions lead investors to have heterogeneity of opinion regarding the stock returns because market conditions is able to influence investors' sentiment (Tuyon and Ahmad, 2017; Baker and Wurgler, 2007). Following Mahmood et al. (2011), the present study measures contemporaneous market condition on the listing date using the following equation (1):

$$MKTCON_{Listing} = \left( \frac{PI_{LISTING} - PI_{OFFER}}{PI_{OFFER}} \right) \quad (1)$$

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

Finally, the present study controls for the effect of the reputation of the underwriters because the offer price in the fixed price method is determined by the negotiations between the underwriter and the issuer (Quintana-García and Benavides-Velasco, 2015). Furthermore, the underwriter plays an important role in ensuring the successful listing of a company (Badru et al., 2017, Ahmad-Zaluki and Abidin, 2011). Moreover, Sundarasan et al. (2017) examined the influence of underwriters' reputation (Big 4) on IPO initial return in Malaysia, using a sample of 228 IPOs for the period 2005–2012. They documented that prestige underwriters have a negative relationship with under-pricing due to investors' perception that reputable underwriters would have placed the offer price of IPOs as close as possible to the market/fair value of the shares. This means that prestige underwriters are able to reduce the investor's heterogeneity of opinion regarding the true value of the listing firm's issue.

## DATA AND METHODOLOGY

The study sample consists of 377 IPOs from January 2004 to December 2015. The Malaysian IPOs have various forms that include the public issue, offer-for-sale, or a hybrid of any of these forms and restricted issues. The current study is only interested in the public issue, offer-for-sale, and any issue that consists of hybrid of any of these two forms. Most of the Malaysian literature concentrates on those issues because they are available to the public (Abdul-Rahim and Yong, 2010; Mohd Rashid et al., 2014) unlike the restricted issues that are not

available for subscription by the general public.<sup>3</sup> Therefore, the current study excludes those types of issues. Moreover, the Malaysian literature concluded that such issues may provide less meaningful outcomes, so they should be dropped from the study sample (Abdul-Rahim and Yong, 2010; Mohd Rashid et al., 2014). Furthermore, the study sample does not include the Real Estate Investment Trust (REIT) category because according to Mohd Rashid et al. (2014), this type of issue presents its financial statements in a different format than the regular new issues.

All the data were manually extracted from various sources, namely: (1) Bursa Malaysia website (<http://www.bursamalaysia.com/market/listed-companies/initial-public-offerings>); (2) Yahoo Finance Singapore (<https://sg.finance.yahoo.com>); and (3) the Star Online website (<https://www.thestar.com.my/business/marketwatch/ipo/>). The data on the over-subscription ratio is not readily available, and so we have to rely on various newspapers' reports such as 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>). Furthermore, since this study focuses only on IPOs that used the fixed-price method, IPOs that employed the book-building method were excluded from the study sample. During the period of this study, there were less than ten IPOs that used the book-building pricing method. Further information is available at the Bursa Malaysia website (<http://www.bursamalaysia.com/market/listed-companies/initial-public-offerings/ipo-summary/>).

Table 1 and Figure 1 shows the variations in the mean, maximum and minimum values of the first-day price range and initial return.

Table 1 Descriptive analysis

| Variable                           | Mean  | Std. Dev. | Min    | Max    |
|------------------------------------|-------|-----------|--------|--------|
| <b>Range</b>                       | 19.58 | 17.38     | 0.0    | 159.30 |
| <b>High first-day price</b>        | 0.91  | 0.66      | 0.11   | 4.38   |
| <b>Low first-day price</b>         | 0.76  | 0.56      | 0.1    | 3.94   |
| <b>Shareholder retention ratio</b> | 66.72 | 9.32      | 0.15   | 83.31  |
| <b>Offer price</b>                 | 1.23  | 0.51      | 0.22   | 5.04   |
| <b>Initial return</b>              | 26.57 | 45.46     | -66.98 | 288.89 |
| <b>Offer size (million)</b>        | 386.0 | 59.2      | 2.75   | 732.0  |
| <b>Over-subscription ratio</b>     | 37.09 | 55.17     | -0.54  | 377.96 |
| <b>Market condition</b>            | 0.795 | 3.62      | -20.0  | 8.57   |

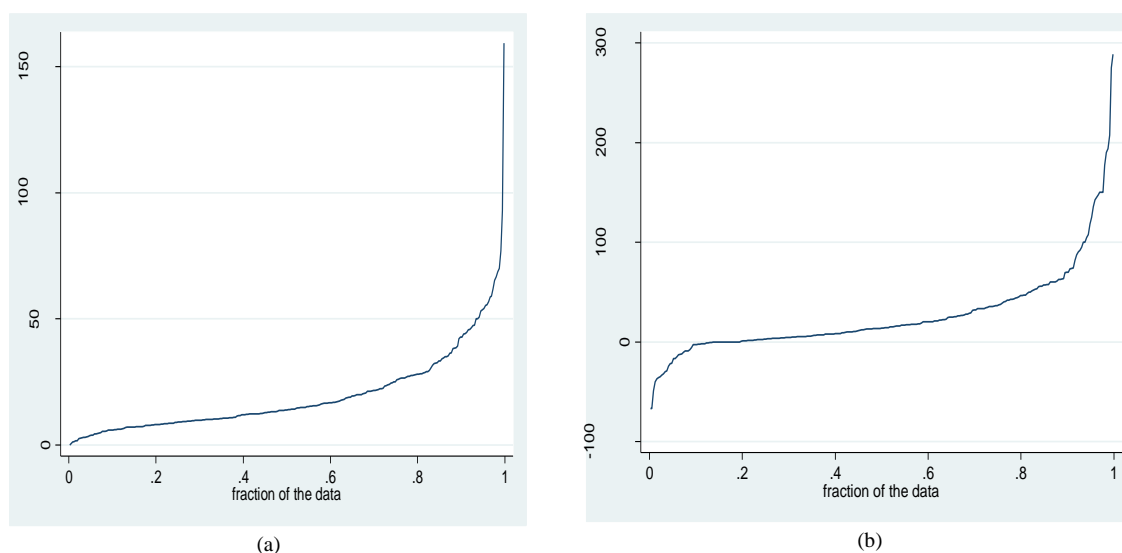


Figure 1 Quantile plot for the first-day price range (a), initial return (b)

<sup>3</sup> Examples of these issues are tender offers, restricted offer-for-sale, special and restricted issues to Bumiputra investors (Bumiputra refers to Malays and indigenous people), restricted offer-for-sale to eligible employees, restricted offer-for-sale to Bumiputra investors, restricted public issue, and special issues.



The effects of all quantiles are visualised in Figure 2. Along the vertical axis of these Figures the coefficient of each variable is plotted and along the horizontal axis the quantiles are plotted. In the middle of the shaded area a thick line is presented, which reflects the coefficient estimate of QR in different quantiles. Furthermore, the OLS estimate of the conditional mean effect is indicated by the dotted line in each graph. The graphs depicted in Figure 2, shows that the OLS coefficient line does not vary and is assumed to be constant, while the quantile coefficient line varies. This clearly shows how the lower and upper quantiles of the study variables.

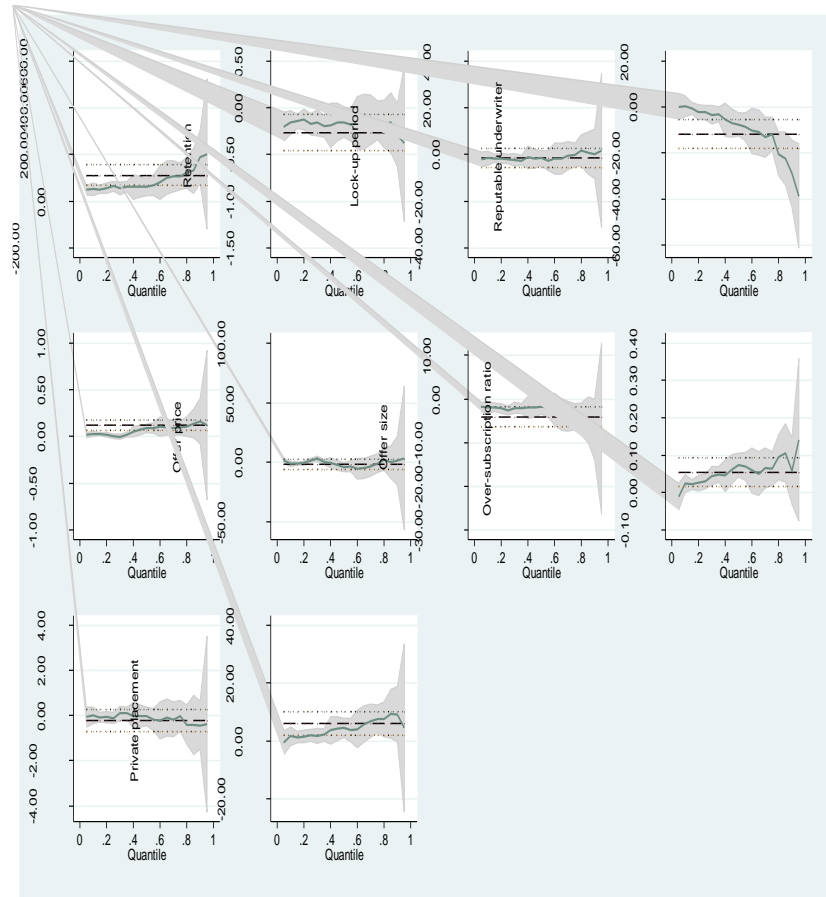


Figure 2 Estimated coefficient for all variables used in the regression analysis

Table 2 summarises both the IPOs distribution of the study population as well as the final sample of 281 IPOs. The distribution of the population and the final sample are established based on the year of listing.

Table 2 Distribution of the study sample based on the year of listing (from 2004 to 2015)

| Listing Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | Total |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Population   | 79   | 79   | 40   | 30   | 23   | 14   | 29   | 21   | 17   | 17   | 15   | 13   | 377   |
| Final sample | 66   | 67   | 30   | 18   | 12   | 12   | 21   | 20   | 9    | 9    | 10   | 7    | 281   |

The present study used the Studentised residuals to check for outliers. According to Ruppert (2004), any value that obtains a score of two or higher (in absolute value) will be considered potential outliers. The study managed to identify thirteen outliers. However, before eliminating the outliers, we implemented the proposed “difference in fits” or DFFITS statistics by Belsley et al. (1980), and advanced by Belsley (1991), using Stata software as suggested by Baum (2006) to measure the influence of each observation on the estimates. The DFFITS statistics did not find any outliers. Furthermore, the practice of eliminating outliers from a set of regression model has been criticised by econometric scholars as this process limits the generalisation of the findings, causes loss of information and does not fulfil the objectives of the research

(Hao and Naiman 2007). Therefore, no outliers have been excluded from the study sample. Finally, the Shapiro-Wilk W test shows a p-value of < 0.01 before and after removing the outliers, thereby rejecting the null hypothesis that the residuals are normally distributed. The QR technique takes into consideration the non-normality of the data by transforming the conditional distribution function into a conditional quantile function and placing data on various segments (e.g. 25th, 50th and 75th) (Badru et al., 2017; Badru and Ahmad-Zaluki, 2018).

Equation (2) presents the multiple regression that is employed through the OLS and QR regression models to examine the influence of the signalling effect of lock-up period and retention ratio on IPO first-day price range.

$$\text{Range} = \alpha + \beta_1 \text{SHRR}_i + \beta_2 \text{LP}_i + \beta_3 \text{UR}_i + \beta_4 \text{OfferP}_i + \beta_5 \text{IR}_i + \beta_6 \text{Supply}_i + \beta_7 \text{OSR}_i + \beta_8 \text{MKC}_i + \beta_9 \text{PRIV}_i + \varepsilon_i \quad (2)$$

where *Range* is the proxy for investors' heterogeneity of opinion, which is calculated as the difference between the maximum price and the minimum price during the first-day of trading, divided by the closing price of the first-day of trading.

*SHRR* is the shareholder retention ratio which represents the percentage of shares that the insiders of the firm remain holding after the firm went public. *LP* is the lock-up period which is represented by a dummy variable that takes the value of one for a lock-up period of 360 and above and zero otherwise. The same method was implemented by Mohd Rashid et al. (2014).

*UR* is a dummy variable that presents underwriter reputation, which takes a value of one for the top ten reputable underwriters and zero otherwise. The study measures underwriter reputation based on the number of IPO issues that an investment bank has underwritten as lead underwriter. Such method has been used by Jelic et al. (2001), Dimovski et al. (2011) to measure underwriter reputation. *OfferP* is the offer price of the listing firm. *Supply* is the natural log of the offer-size. *IR* is the initial return (offer-to-open), which is calculated by dividing the difference between the offer price and opening price by the offer price. *OSR*, is the investors' demand for an IPO, which is proxied by the over-subscription ratio. *MKC* is the market condition during the listing, which is proxied by the EMAS Index. Finally, *PRIV* is the institutional investor involvement, which is represented by a dummy variable that takes the value of one for issues with private placement and zero otherwise.

## RESULTS

### Descriptive statistics

Table 1 presents the descriptive statistics for the sample of 281 IPOs, listed on Bursa Malaysia from January 2004 to December 2015. The average price range is 19.58 per cent, which is close to the average price range of 24.64 per cent in Low and Yong's (2013) paper, where they covered 219 IPOs from January 2004 to December 2007, the average price range of 20.06 per cent in Yong's (2015) paper, where he covered 93 IPOs from January 2009 to December 2013, and the average price range of 19.54 per cent in Yong and Albada's (2018) paper.

The average offer price is RM1.28, with the highest offer price of RM5.041 and the lowest offer price of RM0.22. The lowest and highest values for the supply of IPOs are 2.75 million and 732.0 million respectively, indicating that there is a huge difference in the offer size between the small and big firms in the Malaysian IPO market. Finally, the study reports an average initial return of 26.6 per cent (offer-to-open). This value is slightly similar to Yong's (2011) 26.34 per cent average offer-to-open initial return, who covered the period from 2001 to 2009 and similar to Ammer and Ahmad-Zaluki (2016), where their sample covered the period 2002-2014 and they documented an average level of initial return of 21 per cent. Furthermore, the average initial return of the study is lower than Mohd Rashid et al.'s (2014) 29 per cent average initial return, covering the period of 2000 to 2012, Abdul-Rahim et al.'s (2013) 30 per cent average initial return, covering the period from 2003 to 2008, and Low and Yong's (2011) 30.83 per cent average initial return, over the period from 2000 to 2007.

Table 3 shows the pairwise correlation results between the first-day price range and the study variables. The results indicate that none of the study signalling variables has significant relationships with the first-day price range. However, the offer price, initial return, over-subscription ratio have a positive effect on the first-day price range, with the exception of offer size and reputable underwriters which have negative relationship with the first-day price range. Finally, the correlation between the offer price and initial return is very high, therefore, they cannot be included in the same model.

Table 3 Pairwise correlations between price range and the study variables (N=281)

| #  | Variables               | Range    | 2       | 3        | 4        | 5       | 6        | 7        | 8        | 9        | 10 |
|----|-------------------------|----------|---------|----------|----------|---------|----------|----------|----------|----------|----|
| 2  | Initial return          | 0.3792*  | 1       |          |          |         |          |          |          |          |    |
| 3  | Retention ratio         | -0.0212  | 0.1409* | 1        |          |         |          |          |          |          |    |
| 4  | Lock-up period          | -0.0193  | 0.0822  | 0.1316*  | 1        |         |          |          |          |          |    |
| 5  | Big10 underwriters      | -0.2315* | -0.0416 | -0.0239  | 0.1344*  | 1       |          |          |          |          |    |
| 6  | Offer price             | 0.1863*  | 0.6217* | 0.0991   | 0.0345   | 0.0632  | 1        |          |          |          |    |
| 7  | Offer size              | -0.2939* | -       | -0.2594* | -0.2682* | 0.0038  | -0.1599* | 1        |          |          |    |
| 8  | Over-subscription ratio | 0.3353*  | 0.4960* | 0.086    | 0.1263*  | 0.0053  | 0.3756*  | -0.3231* | 1        |          |    |
| 9  | Market condition        | -0.0168  | 0.1860* | 0.0377   | 0.0595   | 0.0248  | 0.1260*  | -0.0314  | 0.0159   | 1        |    |
| 10 | Private placement       | 0.1568*  | -0.0709 | 0.0989   | -0.1975* | -0.1012 | -0.1341* | -0.1013  | -0.1464* | -0.1304* | 1  |

Notes: \*\* denotes statistical significance at the five percent level.

### Regression results and discussion

Table 4 and Table 5 presents the OLS and QR results on the relationship between IPO first-day price range and the signalling variables of the study. The only difference between the two tables, is Table 4 has the offer price as a control variable and Table 5 has the initial return as a control variable and this has been done due to the high correlation (above 0.5) between the offer price and the initial return. The OLS results indicate that only shareholder retention ratio has a significant negative relationship with the first-day price range and it is significant at the five per cent level. Furthermore, the shareholder retention ratio is significant at the one per cent level using the robust OLS.<sup>1</sup> However, the QR results show that shareholder retention ratio is significant in the lower (25th) and median (50th) quantiles levels at the one per cent level and 10 per cent level (5 per cent level, in Table 5), respectively.

Leland and Pyle (1977) argued that shareholder retention is considered to be a good signal of the firm's quality since the founders of the company have more knowledge about the prospect of the firm and the type of cash flows to be expected in the future compared to the prospective investors, which are considered outsiders. This suggests that prospective investors acknowledge the importance of shareholder retention ratio as a signal and use the information conveyed by this signal to evaluate the price of the listing firm's IPO and to ensure that the current price reflects their beliefs and expectations of the firm in general and the issue price in particular. Furthermore, the literature has shown the importance of shareholder retention ratio as a signalling tool to convey the quality of the firm to the market. For example, according to Michaely and Shaw (1994), IPO firms use signalling as a tool to reduce agency costs, through conveying the message to potential investors that these signals are costly and cannot be imitated by low-quality firms. McBain and Krause (1989) and Certo et al. (2001), indicated that share retention is considered to be a sign of a good quality firm. In the case of Malaysia, Mohd Rashid (2012) and Mohd Rashid et al. (2016) concluded that higher retention ratio signals the quality of the firm, and it is used by prospective investors as an indication of low-risk IPOs that help in reducing under-pricing. However, the OLS results in Table 6 shows that shareholder retention ratio has a significant positive relationship with the initial return.

Two explanations could lead to the positive effect. Ofek and Richardson (2003) present the first explanation by using the economic perspective. They used the economic assumption of downward sloping demand for shares to argue that a high proportion of retention ratio by the pre-IPO owners will lead to a decrease in the number of available shares for trading, which causes the investors to treat available shares as a scarce commodity and thus leading to an increase in share prices. This means that as the number of shares retained increases the greater the under-pricing will become. Finkelstein and Hambrick (1996) provide another explanation for the positive relationship between shareholder retention ratio and under-pricing. They argued

<sup>1</sup> The Stata "regress" command includes a "robust" option for estimating the standard errors using Huber-White sandwich estimators. Such robust standard errors can deal with the collection of minor concerns such as the failure to meet assumptions e.g. minor problems about normality, heteroscedasticity, or some observations that exhibit large residuals, leverage or influence, and autocorrelation. For such minor issues, the robust option may effectively deal with these concerns.

that during the IPO phase, the uncertainty relating to the firm's value is high. Therefore, investors are reassured to find that the founders of the company have an active role in the management or ownership. This lead to an increase in the demand for the listing firm's issues, which lead to an increase in the issues price (under-pricing).

Table 4 OLS and Quantile regression of the price range as the dependent variable (Offer price)

| Variables                        | OLS                  | Robust OLS            | QR                   |                      |                      |
|----------------------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|
| Dependent: First-day price range |                      |                       | 25th                 | 50th                 | 75th                 |
| Shareholder retention ratio      | -0.238**<br>(0.102)  | -0.238***<br>(0.0810) | -0.183***<br>(0.055) | -0.187*<br>(0.108)   | -0.148<br>(0.165)    |
| Lock-up period                   | -1.277<br>(2.135)    | -1.277<br>(2.261)     | -1.966*<br>(1.154)   | -2.319<br>(2.265)    | -1.020<br>(3.439)    |
| Reputable underwriter            | -13.15***<br>(3.185) | -13.15**<br>(5.234)   | -2.451<br>(1.722)    | -6.901**<br>(3.378)  | -14.32***<br>(5.129) |
| Offer price                      | 3.466*<br>(1.949)    | 3.466<br>(2.728)      | 1.898*<br>(1.054)    | 1.790<br>(2.067)     | 3.429<br>(3.139)     |
| Offer size                       | -4.160***<br>(1.156) | -4.160***<br>(1.060)  | -2.585***<br>(0.625) | -2.039*<br>(1.226)   | -4.305**<br>(1.862)  |
| Over-subscription ratio          | 0.0847***<br>(0.018) | 0.0847*<br>(.045)     | 0.0309***<br>(0.010) | 0.0692***<br>(.0199) | 0.0666**<br>(0.030)  |
| Market condition                 | -0.0293<br>(0.256)   | -0.0293<br>(.248)     | -0.0891<br>(0.138)   | 0.0811<br>(.272)     | -0.0194<br>(0.412)   |
| Private placement                | 6.485***<br>(2.130)  | 6.485***<br>(1.874)   | 1.773*<br>(1.151)    | 3.283<br>(2.259)     | 9.040***<br>(3.431)  |
| Constant                         | 107.0***<br>(23.145) | 107.0***<br>(20.143)  | 64.78***<br>(12.513) | 63.48**<br>(24.549)  | 109.4***<br>(37.275) |
| Number of obs.                   | 281                  | 281                   | 281                  | 281                  | 281                  |
| R-squared                        | 0.254                |                       |                      |                      |                      |
| adj. R-squared                   | 0.232                |                       |                      |                      |                      |

Note: \*\*\*, \*\*, \* denote significance at the one 1%, 5%, and 10% levels, respectively. Between brackets is the standard error. Figure in parentheses ( ) are standard error

The OLS results in Table 4 and Table 5 show that the lock-up period does not have a significant result with the first-day price range. However, the QR results show that the lock-up period is negatively significant with the first-day price range in the lower quantile level (25th) at the 10 per cent level. Courteau (1995) argued that the insiders of the firm could use the length of the lock-up period to signal the quality of their firms to the public. His argument is built on the essence that high-quality firms agree on longer lock-up period to signal their quality because deciding on an extended lock-up period imposes enormous cost on insiders because they hold an undiversified portfolio consisting mainly of their firm issues. However, the signalling effect of the lock-up period is very weak and only covers the lower level quantile (25th), where the level of investors' heterogeneity is very low. Furthermore, Yung and Zender (2010) concluded that when the lock-up period does not have the ability to lower the level of information asymmetry and the level of under-pricing in the market it implies that the length of the lock-up period is used to solve the moral hazard problem and hence it serves as a commitment device. The results in Table 6 shows that the lock-up period does not have a significant relationship with the initial return in the Malaysian market.

Brav and Gompers (2003) argued that the lock-up period serves as precautionary measure to guard the investors against after-market insiders. They argued that since after-market insiders may not act in the best interest of the shareholders, lock-up period is implemented to convince the public that the insiders' ability to take advantage of shareholders is reduced. Furthermore, Mohd Rashid et al. (2014) reported that SC in Malaysia mandates that the insiders of the listing firms have to lock-up their issues for a period of one year before August 2009 and 6 months after August 2009. This shows that the intended purpose of the lock-up period is to commit the insiders to act in the best interest of the shareholders, by not allowing the insiders to liquidate their shares for the best price during the initial life of the listing firm. Furthermore, after the mandatory lock-up period ends, on an annual basis, the SC allowed insiders to sell 1/3 of their shares of the 45 per cent shareholding on a straight line basis. Finally, in the developed countries such as the UK and the US, the lock-up period is practiced on an optional basis (Georgen et al. 2010) and the period of the lock-up can be up to three years (Allen and Faulhaber, 1989; Mohan and Chen, 2002; Brav and Gompers, 2003). However, this is not the case in Malaysia. These regulations ensure that lock-up period is used as a commitment device rather than as a signalling tool in the Malaysian IPO market.

Table 5 OLS and Quantile regression of the price range as the dependent variable (initial return)

| Variables                        | OLS                  | Robust OLS           | QR                   |                      |                      |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Dependent: First-day price range |                      |                      | 25th                 | 50th                 | 75th                 |
| Shareholder retention ratio      | -0.268***<br>(0.099) | -0.268***<br>(0.083) | -0.189***<br>(0.057) | -0.218**<br>(0.107)  | -0.128<br>(0.172)    |
| Lock-up period                   | -1.486<br>(2.061)    | -1.486<br>(2.148)    | -1.908*<br>(1.178)   | -1.750<br>(2.225)    | -0.567<br>(3.575)    |
| Reputable underwriter            | -12.01***<br>(3.078) | -12.01**<br>(4.658)  | -2.575<br>(1.759)    | -8.629***<br>(3.324) | -11.38**<br>(5.340)  |
| Initial return                   | 0.108***<br>(.023)   | 0.108**<br>(0.039)   | 0.0158<br>(0.013)    | 0.0481*<br>(0.025)   | 0.0970**<br>(0.039)  |
| Offer size                       | -4.022***<br>(1.118) | -4.022***<br>(1.093) | -2.419***<br>(0.638) | -2.257*<br>(1.207)   | -4.135**<br>(1.939)  |
| Over-subscription ratio          | 0.0537***<br>(0.019) | 0.0537*<br>(0.027)   | 0.0329***<br>(0.011) | 0.0660***<br>(0.021) | 0.0586*<br>(0.034)   |
| Market condition                 | -0.216<br>(0.251)    | -0.216<br>(0.238)    | -0.101<br>(0.143)    | -0.0436<br>(0.271)   | -0.0507<br>(0.435)   |
| Private placement                | 6.104***<br>(2.052)  | 6.104***<br>(1.889)  | 1.872<br>(1.173)     | 3.887*<br>(2.217)    | 7.992**<br>(3.560)   |
| Constant                         | 108.7***<br>(22.243) | 108.7***<br>(20.608) | 64.04***<br>(12.713) | 71.63***<br>(24.026) | 105.0***<br>(38.589) |
| Number of obs.                   | 281                  | 281                  | 281                  | 281                  | 281                  |
| R-squared                        | 0.302                |                      |                      |                      |                      |
| adj. R-squared                   | 0.281                |                      |                      |                      |                      |

Note: \*\*\*, \*\*, \* denote significance at the one 1%, 5%, and 10% levels, respectively. Between brackets is the standard error. Figure in parentheses ( ) are standard error

Finally, on the control variables, the results in Table 4 and Table 5 show that both the reputation of the underwriter and the offer size of the listing firm have a significant negative effect on the first-day offer range. These results suggest that IPOs underwritten by prestigious underwriters have lower heterogeneity of opinion than those underwritten by less prestigious underwriters. In other words, an issuing firm that hires a reputable underwriter is able to reduce investor divergence of opinion regarding its offer price. Sundarasan et al. (2017) indicated that high-quality issuing firms in Malaysian select costly reputable underwriters as a platform to market their credibility. However, the results in Table 6 show that the reputation of the underwriter is unable to influence the initial return of the IPOs. Jelic et al. (2001) suggested that the absence of statistical significance may also point toward a lack of competitive pressure between underwriters in the Malaysian IPO market.

The offer size of the listing firm is negatively and significantly related to the first-day price range in both the OLS and QR models. This means that the higher (lower) the offer size the lower (higher) the heterogeneity of opinion among IPO investors. This finding is consistent with Low and Yong's (2011) findings, where they concluded that periods of high IPO supply are associated with low over-subscription ratio because the supply of the listing firm is sufficient to meet investors demand. This means, higher IPO supply in the marketplace provides investors with greater access to IPO issues, which reduces the speculative activity and help in lowering the level of the first-day price range.

Table 6 OLS and Quantile regression of the initial return as the dependent variable

| Variables                   | OLS                 | Robust OLS          | QR                  |                     |                     |
|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Dependent: Initial return   |                     |                     | 25th                | 50th                | 75th                |
| Shareholder retention ratio | 0.358*<br>(0.215)   | 0.358**<br>(0.172)  | -0.0151<br>(0.187)  | 0.0852<br>(0.148)   | 0.0436<br>(0.161)   |
| Lock-up period              | 3.492<br>(4.455)    | 3.492<br>(3.863)    | 1.857<br>(3.867)    | 0.751<br>(3.062)    | 1.218<br>(3.332)    |
| Reputable underwriter       | -4.472<br>(6.845)   | -4.472<br>(5.823)   | -1.696<br>(5.943)   | -2.626<br>(4.705)   | 1.688<br>(5.119)    |
| Range                       | 0.557***<br>(0.126) | 0.557**<br>(0.280)  | -0.0250<br>(0.109)  | 0.336***<br>(0.087) | 0.641***<br>(0.094) |
| Offer price                 | 41.92***<br>(4.087) | 41.92***<br>(9.199) | 38.73***<br>(3.548) | 56.62***<br>(2.809) | 67.85***<br>(3.057) |
| Offer size                  | 1.404<br>(2.467)    | 1.404<br>(1.801)    | 0.442<br>(2.142)    | 0.619<br>(1.696)    | -0.627<br>(1.845)   |
| Over-subscription ratio     | 0.202***<br>(0.041) | 0.202***<br>(0.071) | 0.105***<br>(0.035) | 0.188***<br>(0.028) | 0.255***<br>(0.030) |

Table 7 OLS and Quantile regression of the initial return as the dependent variable

| Variables                 | OLS                 | Robust OLS           | QR                 |                      |                     |
|---------------------------|---------------------|----------------------|--------------------|----------------------|---------------------|
| Dependent: Initial return |                     |                      | 25th               | 50th                 | 75th                |
| <b>Market condition</b>   | 1.558***<br>(1.534) | 1.558***<br>(0.505)  | 0.775*<br>(0.463)  | 0.715*<br>(0.367)    | 0.562<br>(0.399)    |
| <b>Private placement</b>  | 1.080<br>(4.518)    | 1.080<br>(0.988)     | 1.147<br>(3.921)   | 0.801<br>(3.1051)    | -0.915<br>(3.378)   |
| <b>Constant</b>           | -91.48*<br>(50.122) | -91.48**<br>(35.560) | -45.07<br>(43.509) | -71.67**<br>(34.451) | -62.44*<br>(37.485) |
| <b>Number of obs.</b>     | 281                 | 281                  | 281                | 281                  | 281                 |
| <b>R-squared</b>          | 0.527               |                      |                    |                      |                     |
| <b>adj. R-squared</b>     | 0.511               |                      |                    |                      |                     |

Note: \*\*\*, \*\*, \* denote significance at the one 1%, 5%, and 10% levels, respectively. Between brackets is the standard error. Figure in parentheses ( ) are standard error

In Table 4 and Table 5, the over-subscription ratio has a significant positive effect on the first-day price range, which indicates that the higher the over-subscription ratio the higher the investor's heterogeneity of opinion (Yong, 2015; Low and Yong, 2013). Furthermore, as soon as these IPOs with higher over-subscription are available for trading in the market, investors will more likely bid them up. In other words, additional pressure will naturally be put on the after-market price of these IPOs due to the excess demand for them, thus resulting in higher initial return. This is shown in Table 6 results, where the over-subscription ratio has a significant positive effect on IPO initial return for both the OLS and QR models.

Private placement in Table 4 and Table 5, have a significant and positive relationship with the first-day price range in both the OLS and QR models. This means that issues with a larger proportion of institutional investors will have higher investors' heterogeneity of opinion. Welch's (1992) bandwagon effect or informational cascade model is able to explain such behaviour. According to Welch (1992), in deciding whether or not to subscribe to IPO shares, potential investors make decisions not only based on their personal information but also on the subscription decisions of other well-informed investors. An information cascade will form when investors make their decisions by observing the decisions or choices of others even though they themselves have favourable information. Furthermore, Yong (2011) has concluded that the existence of a large group of informed investors can create a bandwagon effect when the market over-reacts to the pricing of an IPO.

In Table 4, the results show that the offer price has weak positive significant relationship with the first-day price range in both the OLS and QR models. This suggests that higher offer price leads to higher dispersion of beliefs among prospective investors. Such relationship was reported by Yong (2015) and Low and Yong (2013), who argued that offer price may increase investor's heterogeneity, leading to a higher price drift. This is shown in Table 6, where the offer price is significant at the one per cent level in all the quantile levels and the OLS models. Furthermore, the results in Table 5, show that initial return has a positive and significant effect on the first-day range. This means the higher the initial returns the higher the investor's heterogeneity of opinion and this relationship was documented by Yong and Albada (2018), Yong (2015), and Low and Yong (2013).

Finally, the relationship between the first-day price range and initial return is presented in Table 6. The results show that as investor's heterogeneity of opinion increases in the IPO market the higher the initial return will become due to the increase in the price drift (Vega, 2006). The results in both the OLS and QR models in Table 6 show that under-pricing in the IPO market increases as investor's heterogeneity of opinion increases. This relationship was argued by the various researchers, such as Yong (2015), Low and Yong (2013), Vega (2006), Chowdhry and Sherman (1996) and Chahine (2007). However, in this study, we were able to empirically show this relationship between investors' heterogeneity of opinion and initial return.

## CONCLUSION

This study examines the effect of signalling on investors' heterogeneity of opinion regarding the true value of the listing firm's issues. In particular, we examine the role of the lock-up period and shareholder retention ratio in influencing the investors' heterogeneity of opinion, which is measured by the IPO first-day price range. The study sample consists of 281 IPOs that sought listing on Bursa Malaysia from January 2004 to December 2015. The study employs both the QR technique in addition to the OLS method in investigating the

relationship between the dependent and independent variables. The QR technique is able to outperform the OLS method by allowing the study to investigate the influencing effect of the independent variables on the dependent variable at different points of the distribution. This made possible through the ability of the QR techniques to present the distribution of the dependent variable through different quantiles (e.g. 25th, 50th and 75th).

The study found through the OLS analysis that only the shareholder retention ratio has a significant negative effect on the first-day price range. Moreover, through the QR technique, the study managed to find that shareholder retention ratio is significant at the lower and median quantiles (25<sup>th</sup> & 50<sup>th</sup>). This means that investors consider the percentage of the shares retained by the listing firm's insiders in building their investment decision and in evaluating the price of the listing firm's offer price. Furthermore, this shows that shareholder retention ratio is capable of signalling the quality of the listing firm to the market and reducing investors' heterogeneity of opinion regarding the true value of the listing firm's offer price. In addition, the lock-up period does not have a significant relationship with the first-day price range, suggesting that the lock-up in the Malaysian market serves as precautionary measure to guard the investors against after-market insiders' actions.

The study has six control variables, which have been identified by the literature as unique to the Malaysian IPO market due to the use of the fixed-price method and could potentially influence investor's opinion regarding the true value of the listing firm's issues. The results show that IPO issues with higher offer price, higher over-subscription ratio, and larger subscription from informed investors, are associated with higher investor's heterogeneity of opinion regarding the true value of the listing firm's issues. In short, attractive IPOs that are available in small quantities increase the chances of controversy due to the diversity in prospective investors' opinions and expectations regarding the true value of the IPO. This heterogeneity affects investors' behavioural tendencies when the IPO issue starts trading and causes the price to drift. This is shown by the positive relationship between the initial return of IPOs and first-day price range and vice versa. Finally, the offer size has a negative effect on investor's heterogeneity.

## REFERENCES

- Abdul-Rahim, R, & Yong, O 2010, 'Initial returns of Malaysian IPOs and Shari'a compliant status', *Journal of Islamic Accounting and Business Research*, vol. 1, no. 1, pp. 60–74.
- Abdul-Rahim, R, Sopian, RZZ, Yong, O & Auzairy, NA 2013, 'Flipping activity and subsequent after-market trading in Malaysian initial public offerings (IPOs)', *Asian Academy of Management Journal of Accounting and Finance*, vol. 9 no. 1, pp. 113–128.
- Ahmad-Zaluki, NA & Abidin, S 2011, 'IPO pricing in Malaysia: An analysis of REITs and non-REITs' *International Journal of Economics and Management*, vol. 5, no. 1, pp. 319–332.
- Albada, A, Yong, O, Mat Hassan, ME & Abdul-Rahim, R 2018. 'Retention ration, lock-up period and prestige signals and their relationship with initial public offering (IPO) return: Malaysian evidence', *Asian Academy of Management Journal of Accounting and Finance*, vol. 14, no. 2, pp. 1–23.
- Allen, F & Faulhaber, GR 1989, 'Signalling by under-pricing in the IPO market', *Journal of Financial Economics*, vol. 23, no. 2, pp. 303–323.
- Badru, BO & Ahmad-Zaluki, NA 2018, 'Explaining IPO initial returns in Malaysia: ex ante uncertainty vs signalling', *Asian Review of Accounting*, vol. 26, no. 1, pp. 84-106.
- Badru, BO, Ahmad-Zaluki, NA & Wan-Hussin, WN 2017, 'Board characteristics and the amount of capital raised in the Malaysian IPO market', *Journal of Multinational Financial Management*, vol. 42-43, pp. 37-55.
- Baker, M & Wurgler, J 2007, 'Investor sentiment in the stock market', *Journal of Economic Perspectives*, vol. 21, no. 2, pp. 129–151.
- Beatty, RP & Ritter, JR 1986, 'Investment banking, reputation, and the under-pricing of initial public offerings', *Journal of Financial Economics*, vol. 15, no. 1–2, pp. 213–232.
- Belsley, DA (Eds) 1991, *Conditioning Diagnostics*, Hoboken, NJ: John Wiley & Sons Inc.
- Belsley, DA, Kuh, E & Welsch, RE 1980, *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity*, Hoboken, NJ: John Wiley & Sons, Inc.

- Benveniste, LM & Busaba, WY 1997, 'Bookbuilding vs. Fixed Price: An Analysis of Competing Strategies for Marketing IPOs', *Journal of Financial and Quantitative Analysis*, vol. 32, no. 4, pp. 383-403.
- Benveniste, LM & Spindt, PA 1989, 'How investment bankers determine the offer price and allocation of new issues', *Journal of Financial Economics*, vol. 24, no. 2, pp. 343-362.
- Biais, B, Bossaerts, P & Rochet, J 2002, 'An optimal IPO mechanism', *Review of Economic Studies*, vol. 69, pp. 999-1017.
- Bradley, DJ & Jordan, BD 2002, 'Partial adjustment to public information and IPO under-pricing' *Journal of Financial and Quantitative Analysis*, vol. 37, no. 4, pp. 595-616.
- Brav, A & Gompers, PA 2003, 'The role of lock-ups in initial public offerings', *Review of Financial Studies*, vol. 16, no. 1, pp. 1-29.
- Butler, AW, Connor, MO & Kieschnick, R 2014, 'Robust determinants of IPO under-pricing and their implications for IPO research', *Journal of Corporate Finance*, vol. 27, no. 1, pp. 367-383.
- Certo, ST, Daily, CM & Dalton, DR 2001, 'Signalling firm value through board structure: An investigation of initial public offerings', *Entrepreneurship: Theory and Practice*, vol. 26, no. 2, pp. 33-50.
- Chahine, S 2007, 'Investor interest, trading volume, and the choice of IPO mechanism in France', *International Review of Financial Analysis*, vol. 16, pp. 116-135.
- Chowdhry, B, Sherman, A 1996, 'International differences in oversubscription and under-pricing of IPOs', *Journal of Corporate Finance*, vol. 2, pp. 359-381.
- Clarkson, PM, Dontoh, A, Richardson, G & Sefcik, SE 1991, 'Retained ownership and the valuation of initial public offerings: Canadian evidence', *Contemporary Accounting Research*, vol. 8, no. 1, pp. 115-131.
- Courteau, L 1995, 'Under-diversification and retention commitments in IPOs', *Journal of Financial & Quantitative Analysis*, vol. 30, no. 4, pp. 487-517.
- Daniel, K, Hirshleifer, D & Teoh, SH 2002, 'Investor psychology in capital markets: Evidence and policy implications', *Journal of Monetary Economics*, vol. 49, no. 1, pp. 139-209.
- Derrien, F & Womack, K 2003, 'Auctions vs. book building and the control of under-pricing in hot IPO markets' *Review of Financial Studies*, vol. 16, pp. 31-61.
- Fama, E & French, K 2007, 'Disagreement, tastes, and asset prices', *Journal of Financial Economics*, vol. 83, no. 3, pp. 667-689.
- Finkelstein, S & Hambrick, DC 1996, *Strategic leadership: Top executives and their effects on organizations*, Minneapolis: West Pub. Co.
- Garfinkel, JA 1993, 'IPO under-pricing, insider selling and subsequent equity offerings: Is under-pricing a signal of quality?', *Financial Management*, vol. 22, no. 1, pp. 74-83.
- Georgen, M, Mazouz K & Yin, S 2010, 'Price, volume and spread affects associated with the expiry of lock-in agreements', *Pacific-Basin Finance Journal*, vol. 18, no. 5, pp. 442-459.
- Goldberg, J & Nitzsch, R 2001, *Behavioral Finance*, London: John Wiley and Sons. Inc.
- Hao, L & Naiman, DQ 2007, *Quantile regression: Quantitative applications in the social sciences*, 1st ed. London: Sage Publications.
- Hong, H & Stein, J 2007, 'Disagreement and the stock market', *The Journal of Economic Perspectives*, vol. 21, no. 2, pp. 109-128.
- Jelic, R, Saadouni, B & Briston, R 2001, 'Performance of Malaysian IPOs: Underwriters reputation and management earnings forecasts', *Pacific-Basin Finance Journal*, vol. 9, no. 5, pp. 457-486.
- Kandel, E & Pearson, ND 1995, 'Differential interpretation of public signals and trade in speculative markets', *The Journal of Political Economy*, vol. 103, no. 4, 831-872.
- Leland, HE & Pyle, DH 1977, 'Informational asymmetries, financial structure, and financial intermediation', *Journal of Finance*, vol. 32, no. 2, pp. 371-387.
- Ljungqvist, A 2008, IPO under-pricing. In: Eckbo, B.E. (Ed.), *Handbook of Empirical Corporate Finance* (1<sup>st</sup> Ed., pp. 375-422), North Holland: Elsevier Science.
- Low, SW & Yong, O 2011, 'Explaining over-subscription in fixed-price IPOs: Evidence from the Malaysian stock market', *Emerging Markets Review*, vol. 12, no. 1, pp. 205-216.
- Low, S-W & Yong, O 2013, 'Initial public offerings and investor heterogeneity: Evidence from Malaysia', *American Journal of Finance and Accounting*, vol. 3, no. 1, pp. 41-56.



- Lowry, M & Schwert, W 2002, 'IPO market cycles: Bubbles or sequential learning?', *Journal of Finance*, vol. 57, pp. 1171-1200.
- 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*, vol. 4, no. 2, pp. 226-237.
- McBain, ML & Krause, DS 1989, 'Going public: The impact of insiders' holdings on the price of initial public offerings', *Journal of Business Venturing*, vol. 4, no. 6, pp. 419-428.
- Michaely, R & Shaw, WH 1994, 'The pricing of initial public offerings: Tests of adverse-selection and signalling theories', *Review of Financial Studies*, vol. 7, no. 2, pp. 279-319.
- Miller, E 1977, 'Risk, uncertainty and divergence of opinion', *Journal of Finance*, vol. 32, pp. 1151-1168.
- Mohan, N & Chen, C 2002, 'Information content of lock-up provisions in initial public offerings', *International Review of Economics and Finance*, vol. 10, no. 1, pp. 41-59.
- Mohd Rashid, R 2012, 'Does Shareholder Retention Matter in Explaining the Under-Pricing Phenomenon of Malaysian IPOs?', *Journal of American Academy of Business*, vol. 18, no. 1, pp. 293-299.
- 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*, vol. 38, no. 4, pp. 487-501.
- Mohd-Rashid, R, Abdul-Rahim R & Che-Yahya, N 2016, 'Shareholder Retention Influence on the Flipping Activity of Malaysian IPOs', *Pertanika Journal of Social Sciences & Humanities*, vol. 24, pp. 133-144.
- Ofek, E & Richardson, M 2003, 'DotCom mania: The rise and fall of internet stock prices', *Journal of Finance*, vol. 58, no. 3, pp. 1113-1137.
- Quintana-García, C & Benavides-Velasco, CA 2015, 'Gender diversity in top management teams and innovation capabilities: The initial public offerings of biotechnology firms', *Long Range Planning*, vol. 49, no. 4, pp. 507-518.
- Ritter, JR 1984, 'The hot issue market of 1980', *Journal of Business*, vol. 57, pp. 215-240.
- Ritter, JR & Welch, I 2002, 'A review of IPO activity, pricing, and allocations', *Journal of Finance*, vol. 57, no. 4, pp. 1795-1828.
- Rock, K 1986, 'Why new issues are under-priced', *Journal of Financial Economics*, vol. 15, no. 1-2, pp. 187-212.
- Ruppert, D 2004, *Statistics and finance an introduction*, New York: Springer.
- Sundarasan, SD, Khan, A & Rajangam, N 2017, 'Signalling roles of prestigious auditors and underwriters in an emerging IPO market', *Global Business Review*, vol. 19, no. 1, pp. 69-84.
- Tuyon, J & Ahmad, Z 2017, 'Psychoanalysis of investor irrationality and dynamism in stock market', *Journal of Interdisciplinary Economics*, vol. 29, no. 2, pp. 1-38.
- Vega, C. 2006, 'Stock price reaction to public and private information', *Journal of Financial Economics*, vol. 82, pp. 103-133.
- Wang, H & Liu, X 2014, 'The impact of investor heterogeneity in beliefs on share repurchase', *International Journal of Econometrics and Financial Management*, vol. 2, no. 3, pp. 102-113.
- Wan-Hussin, WN 2005, 'The effects of owners' participation and lock-up on IPO under-pricing in Malaysia', *Asian Academy of Management Journal*, vol. 10, no. 1, pp. 19-36.
- Welch, I 1989, 'Seasoned offerings, imitation costs, and the under-pricing of initial public offerings', *Journal of Finance*, vol. 44, no. 2, pp. 421-449.
- Wong, WC, Ong, SE & Ooi, JTL 2013, 'Sponsor backing in Asian REIT IPOs', *Journal of Real Estate Finance and Economics*, vol. 46, no. 2, pp. 299-320.
- Yong, O 2011, 'Winner's curse and bandwagon effect in Malaysian IPOs: Evidence from 2001-2009', *Journal Pengurusan*, vol. 32, no. 1, pp. 21-26.
- Yong, O 2015, 'What is the "true" value of an initial public offering?', *Journal of Scientific Research and Development*, vol. 2, no. 10, pp. 78-85.
- Yong, O & Albada, A 2018, 'Under-Pricing and Listing Board in Explaining Heterogeneity of Opinion Regarding Values of Malaysian IPOs', *Jurnal Pengurusan*, vol. 51, pp. 63-72.
- Yung, C & Zender, JF 2010, 'Moral hazard, asymmetric information and IPO lock-ups', *Journal of Corporate Finance*, vol. 16, no. 3, pp. 320-332.

- Zhang, X, Zhang, M, Huang, S & Zhou Y 2015, 'Heterogeneous expectations, IPO under-pricing and issuing mechanism', *Financial Innovation*, vol. 1, no. 11, pp. 1-14.
- Zheng, SX, Ogden, JP & Jen, FC 2005, 'Pursuing value through liquidity in IPOs: Under-pricing, share retention, lock-up, and trading volume relationships', *Review of Quantitative Finance and Accounting*, vol. 25, no. 3, pp. 293-312.