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# Voluntary Lock-Up Provisions and Performance of IPOs: Effects of Information Asymmetry[1]

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A lock-up provision restricts insiders from selling or disposing of a certain portion of their shares for a prescribed period. In Malaysia, most firms usually lock-up a higher portion of their shareholding than what is legally required. Despite allegations that mandatory lock-up provision results in a loss of its signaling property, the presence of the voluntary element in its actual conduct suggests that the lock-up could still serve as an effective signaling mechanism for issuers. This study postulates that a higher voluntary lock-up ratio signals the commitment of major shareholders to overcome the potential of moral hazard issues. Consequently, investors would be attracted to subscribe to IPOs once the risks were less evident and higher returns could still be expected. This study employs a data set from a sample of 373 IPOs listed on Bursa Malaysia from 2000 to 2012 to examine the impact of voluntary lock-up ratio on the initial returns of IPOs in the presence of information asymmetry. The findings demonstrate that voluntary lock-up ratio is significantly positive in influencing initial returns. Further analysis reveals that voluntary lock-up ratio is more consistent with signaling risk than with the quality of IPOs.

**Keywords:** Voluntary lock-up ratio, initial returns, signaling theory, IPOs, quantile

## 1. Introduction

The enforcement of lock-up provision (also known as share moratorium) on issuers of initial public offerings (IPOs) aims to prevent substantial shareholders (referred to as "promoters" in Malaysia) from selling or

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disposing of their shares for a specified period following a listing. One of the reasons for having the share moratorium guideline in Malaysia is to avoid excessive selling by insiders after the IPOs are listed, as such action is most likely to have an adverse impact on the IPO price. Therefore, the mandatory lock-up provisions implemented in May 1999 on major shareholders (or promoters) of IPO issues was mainly to avoid such an adverse effect. While there is sufficient empirical evidence on the effect of lock-up agreement in other developed markets, specifically the UK, the US, and Australia, the implementation is voluntary. Therefore, investors from developing markets, specifically Malaysia, cannot make their investment decisions based on the findings in these markets.

In Malaysia, one may argue that the mandatory nature of the lock-up provision makes it a norm, and therefore should no longer play a significant role in IPO investment decisions. Nonetheless, our preliminary observation shows that although IPO issuers are legally required to lock 45 percent of the shareholding, most of them lock-up higher percentages. In short, despite the mandatory lock-up provision, the voluntary elements in the lock-up ratio show insiders' commitment to, and significant economic interest in, the firms. Furthermore, since such a decision implies that insiders are willing to bear the opportunity cost of foregoing a quick profit during the IPO listing, it shows that the voluntary component of the lock-up ratio carries an important signal about IPOs.

In Malaysia, the relationship between lock-up provision and initial returns was examined by Wan-Hussin (2005), who employed the blocked portion of directors' shares to measure the lock-up ratio. His study covered the period before the commencement of the mandatory lock-up regime on May 3, 1999. However, a recent study by Mohd Rashid et al. (2014) found that the lock-up period is significant in explaining initial returns but not the lock-up ratio. Given the different findings, the present study pioneers an examination of the role of lock-up provision from the voluntary aspect of its implementation, during the period when mandatory lock-up was in effect. Specifically, this study is different from previous ones (Wan-Hussin, 2005; Mohd Rashid et al., 2014) in that it segregates the lock-up provision into voluntary and mandatory portions.

This study adopts the argument presented by Courteau (1995), who extended the signaling model of Leland and Pyle (1977) to examine insiders' reliance on IPO lock-up as a signaling mechanism. According to Courteau (1995), insiders of a high-quality firm would more likely agree to a longer lock-up period, despite the potential opportunity costs of holding onto an undiversified portfolio. Rationally, insiders would not adhere to the lock-up agreement unless and until they foresaw that the accrued benefits offset the costs. In similar vein, Grinblatt and Hwang (1989) suggested that high-quality firms gauge their prospects by divesting only a small portion of their total shares at IPOs. Retaining or locking up a larger percentage of their shares would validate their belief in better prospects or the higher quality of their firms. Such a positive signal would normally attract favorable market reaction through higher prices upon listing. Accordingly, the optimistic signal results in positive initial returns.

Nonetheless, the positive relationship between lock-up and initial returns could also serve as a signal of risk. Brav et al. (1999) cautioned that both lock-up ratio and lock-up period reveal the risk-bearing capacities of IPO issuers. This is because they reckon firms with higher information asymmetry tend to commit to a longer lock-up period and higher lock-up ratio, which subsequently leads to deeper IPO underpricing. The argument that voluntary lock-up ratio signals risk is also consistent with a recent finding by Gao and Siddiqi (2012), who showed that firms with a longer lock-up period have greater agency problems and poor long-term performance. Mohan and Chen (2001) also reported a similar positive relationship between lock-up period and initial returns in developed markets. They believe that as a longer lock-up period alludes to uncertainty of the firm's value, a deeper underpricing is required to obtain full subscription of the IPOs. Drawing from this argument, this study contends that insiders in high-risk firms are more likely to agree to voluntarily commit to a larger percentage of shares to be locked up (than the minimum requirement of 45% under the 1999 Equity Guidelines).

Effective May 3, 1999, the Securities Commission (SC) of Malaysia imposed a standard requirement of a moratorium on the disposal of shares by IPO promoters, amounting to 45% of the enlarged issued and paid-up capital of the company for at least one year from the date of listing (Securities Commission, 1999). Several amendments to the

provision denote stricter enforcement of the regulations. While the continuous concerns of the market regulator suggest the need for empirical studies, there are allegations that once the lock-up provision is enforced, committing to it becomes a normal activity, such that it loses its signaling property. In this respect, the Malaysian IPO market is unique because issuers in this market generally voluntarily lock-up a larger proportion of their shares than the stipulated amount. In short, the presence of a voluntary element in the implementation of lock-up provision in this market could still serve as an effective signaling mechanism for issuers.

This study attempts to bridge the gap in Malaysian IPO literature by examining the role of voluntary lock-up ratio in explaining the initial returns of IPOs in the presence of information asymmetry. Signaling content is more prominent in an environment characterized by severe information asymmetry (Carter and Manaster, 1990; Leland and Pyle, 1977; Riley, 1979; Spence, 1976). This argument is consistent with Eldomiaty (2008), who postulates that developing markets have higher information asymmetry than developed markets. Since this study focused on a single market, the extent of information asymmetry was captured through an intra-IPOs mechanism. This study grouped the IPOs based on their market capitalization (Fama and French, 1993) to identify IPO firms operating in an environment of high information asymmetry (smaller firms) and those that do not (bigger firms). Previous studies by Goergen et al. (2006), Beatty and Ritter (1986), and Barclay and Smith (1995) conjectured that small firms have high information asymmetry compared to large firms, which are normally more established and therefore, information is more widely available. Furthermore, the use of quantile regression in examining the influence of voluntary lock-up ratio on different quantiles of initial return is another contribution of this paper.

The structure of the rest of this paper is as follows: Section 2 reviews relevant studies to provide a theoretical and empirical basis for hypothesis development. Section 3 discusses the data and methodology, while Section 4 presents and discusses the results. Finally, Section 5 provides the conclusion, limitations, and implications of the results.

## 2. Literature Review

Lock-up provision in Malaysia is mandatory, yet its voluntary elements could provide an important signal to investors, as it reflects the commitment of major shareholders to hold a certain portion of shares for a prescribed period (Arthurs et al., 2009; Hakim et al., 2012). Courteau (1995) formulated a voluntary lock-up model on the premise that issuers are able to signal the future outlook of their companies through the voluntary element involved in the lock-up provision. She contended that insiders of high-quality firms are more likely to agree to a longer lock-up period. In such situations, insiders agree to retain their shares, and thus have to hold on to an undiversified portfolio. This implies that restricting the sale of stocks for a longer period imposes a cost to them. Given that the commitment to lock-up represents a cost, only insiders of firms of high quality would agree to lock for a longer period. On the other hand, insiders of low-quality firms would opt for shorter lock-up periods because they would be unwilling to bear the cost of committing to a longer lock-up period.

Similar to Courteau (1995), Brav and Gompers (2003) suggested that given the adverse selection problem, both mandatory and voluntary lock-up provisions serve as a commitment device to gain the trust of investors and thereby induce them to subscribe to new shares at the IPO offering. In a similar vein, Nowak (2004) reaffirmed that the mandatory prohibition of share disposal is a signal to the public that the IPO issuers are committed to the well-being of all shareholders. Recently, Ramírez et al. (2011) also claimed that the lock-up provision is costly for insiders; nevertheless, it provides a positive signal on the firm's value. In contrast, voluntary lock-up goes a step further by also signaling the quality of the issuers. According to Nowak (2004), IPO firms have incentives to commit to voluntary lock-up conditions for signaling reasons. To a certain extent, his finding is consistent with his assertion as it shows that towards the expiry of the lock-up period, an adverse price reaction is considerably higher for a voluntary lock-up arrangement than a mandatory lock-up arrangement.

This argument is further supported by Grinblatt and Hwang (1989), who concurred that high-quality firms tend to signal their confidence through the retention of a larger portion of total shares. Assuming the market is efficient, such a positive signal would rationally trigger a favorable

market reaction by increasing the IPO price upon its listing. Consequently, there is a positive relationship as the good signal voluntary lock-up ratio sends results in higher initial returns.

However, the opposite relationship could arise if investors perceive the good-quality signal as low risk. The risk-return trade-off hypothesis indicates that such IPOs offer lower initial returns. Goergen et al. (2006) noted that small and young firms, which reflect characteristics of high uncertainty in Germany and France, tend to commit to longer lock-up periods and retain a higher proportion of the shares. However, the authors did not find evidence that these firms signal superior quality, despite insiders holding their shares for a longer period than the mandatory requirement. Recently, Yung and Zender (2010) also confirmed that firms with the moral hazard problem tend to lock in their shares for a longer period. Based on this study, high-risk firms would not only agree to a longer lock-up period but also for a larger lock-up ratio. This reflects an additional commitment that emanates from a voluntary decision of insiders in the firms.

With respect to the signaling hypothesis, it is crucial to note that signaling is more prevalent in an environment in which there is acute asymmetric information. In the context of an IPO, there would be information asymmetry and limited information made available to the public (Carter and Manaster, 1990; Leland and Pyle, 1977). Although IPO issuers are legally required to disclose their full information in the prospectus, pre-IPO owners tend to misrepresent the information (Riley, 1979; Spence, 1976). Investors, therefore, would usually search for other good signals that might be relevant to determine the firm's value (Downes and Heinkel, 1982; Spence, 1976). Ritter and Welch (2002) explained that rational investors have to be assisted to mitigate their fears about the "lemon" problem since they know that issuers are always better informed than investors.

Based on the arguments and evidence presented, the present study hypothesizes that:

H1: Voluntary lock-up ratio has a positive influence on the initial returns of IPOs.
H2: Information asymmetry moderates the positive influence of voluntary lock-up ratio on initial returns.

## 3. Research Methodology

The sample for this study is selected from IPOs listed on Bursa Malaysia (formerly known as the Kuala Lumpur Stock Exchange) between 2000 and 2012; that is, after the implementation of the mandatory lock-up provision that took effect on May 3, 1999. Data sources include websites of Bursa Malaysia and the Securities Commission, companies' annual reports and prospectuses, Datastream and the Star on-line. This study excludes special types of offers and IPOs with missing data and extreme outliers to avoid less meaningful outcomes. The final sample consists of 373 IPOs, representing 78 percent of the total IPOs issued during the study period. In order to incorporate the effects of information asymmetry, the samples for this study are sorted into three portfolios based on the Fama and French (1993) size factor, i.e., market capitalization of the issuing firms and then size of the IPOs' issues to test robustness. The proposition that firms' size proxies information asymmetry is consistent with the common association between smaller and younger firms, and a higher information asymmetry between insiders and outsiders, as stated by Goergen et al. (2006) and Barclay and Smith Jr., (1995). The dependent variable, initial returns (*IROPEN*), is calculated as follows;

$$IROPEN_i = \frac{(P_i^{OPEN} - P_i^{OFFER})}{P_i^{OFFER}} \quad (1)$$

Where $P^{OPEN}$ is opening price on the first listing day; and $P^{OFFER}$ is the offer price of the IPOs. This study employs a cross-sectional regression model in the following form:

$$IR_i = \alpha + \beta_1 VLR_i + \beta_k \sum_{k=1}^{K} CV_{i,k} + \varepsilon \quad (2)$$

Furthermore, to get a more complete picture of various distributions, we examine the impact of voluntary lock-up ratio in different quantiles of IPO initial return. This study employs the quantile regression approach proposed by Koenker and Bassett Jr (1978). In estimating the standard error for quantile regression, this study uses Chamberlain's bandwith and the Epanechnikov kernel function, as suggested by Pagan and Aman (1999) that could minimize the mean integrated squared error. Another method of quantile regression is using the bootstrap if the study sample

has heteroskedasticity. However, the quantile regression of heteroskedasticity errors is not present.

To examine the moderating effect of information asymmetry, an interaction variable (*VLR*MKTCAP*) is introduced into the basic model in Equation (2).

$$IR_i = \alpha + \beta_1 VLR_i + \beta_2 (VLR * MKTCAP)_i + \beta_k \sum_{k=1}^{K} CV_{i,k} + \varepsilon \qquad (3)$$

Where V*LR* is the voluntary lock-up ratio, which is the difference between the actual and mandatory lock-up ratio[3]; $\alpha$ is the intercept; $\beta$ is the estimated coefficient, and $\varepsilon$ is the error term. $CV_k$ is a set of variables from $k$ = 1,…, K which are controlled for in this model due to their significant influence on initial returns, as documented in previous studies (Bradley and Jordan, 2002; Mohd-Rashid et al., 2013a; Mohd Rashid et al., 2013b; Su and Fleisher, 1999). Variable *k* includes *MKTCAP* (*Total number of shares outstanding post IPO* x *Offer Price*) to proxy for the supply of IPOs. *OSR* is the oversubscription ratio, which proxies demand for IPOs. *DPRIV* is the dummy, and equals one for an IPO issued with private placements and zero otherwise, which proxies for institutional investor participation (Che-Yahya et al., 2014). *RISK* of the IPO is calculated as the reciprocal of the offer price, *MKTCON1* equals $(PI^{LISTING} - PI^{OFFER})/PI^{OFFER}$ where *PI* is the price index of the EMAS index and *MKTCON2* equals $(PI^{LISTING} - PI^{3\ months\ prior\ to\ offer)})/PI^{3\ months\ prior\ to\ offer}$. Finally, the interaction term is the product of *VLR and MKTCAP*.

## 4. Results and Discussion

Figure 1 illustrates the trend of the voluntary lock-up ratio and initial returns of Malaysian IPOs between 2000 and 2012. It is pertinent to note that as argued in an earlier section, voluntary lockup ratio remains prevalent in the practice of Malaysia lock-up provision. The highest voluntary lock-up ratio was reported in the category of initial return higher than 100 percent (11%). On average, the voluntary lock-up ratio was 8 percent, ranging from the highest voluntary lock-up ratio of 38.53

[3] The portion of voluntary lock-up ratio is further confirmed by checking the shareholdings of the affected shareholders in the prospectus against those reported in the first annual report after the IPO was listed.

percent to nil. The highest voluntary lock-up ratio recorded was for D&O Ventures Berhad, an IPO listed in 2004.

Table 1 presents the profiles of the variables employed in this study. As shown in Table 1, the average voluntary lock-up ratio shows that most of the issuers intentionally lock-up higher ratio either as a commitment device signaling the quality of the IPO or to offset the uncertainty of the issuers. The increasing trend of the voluntary lock-up ratio that coincides with the increasing trend of initial return of IPOs motivates this study to further examine the significance of the voluntary lock-up ratio in explaining the initial return. It is also worth noting that the results of the Wilcoxon Z-score for the low versus high initial return categories indicate that all the variables have a significant difference except for the private placements. The preliminary result also suggests that each of the selected variables in this study behaves differently in influencing initial returns.

Table 2 (Panel A) reports the estimated coefficients obtained from the regression analysis after correcting for autocorrelation, using the Newey-West procedure and remedying heteroskedasticity problems using the White Heteroskedasticity test. The regression models also passed the Ramsey Reset test of model specification. The coefficient of the *VLR* indicated a positive and significant effect of voluntary lock-up ratio on initial returns and hence, the first hypothesis is not rejected. This finding is consistent with the study by Courteau (1995), who claimed that insiders could use voluntary lock-up as a signaling device. The positive relationship probably proves that when insiders lock up more than the mandated proportion, investors interpret it as a signal on the future prospects of the firms. Therefore, the signal triggers investors' willingness to pay a higher price for the IPOs (Allen and Faulhaber, 1988; Grinblatt and Hwang, 1989; Welch, 1989). Similarly, Grinblatt and Hwang (1989) suggested that the positive signal indicates more investors are attracted into the IPO market, and the reaction accordingly pushes the price up upon listing. This finding is also consistent with Nowak (2004), who asserted that voluntary lock-up not only signals commitment, but also indicates the quality of the underwriter. Since risk in Table 2 is barely significant, the voluntary lock-up ratio could reflect either signaling commitment or the firm's quality, and in turn be construed as lower risk. Although the finding appears consistent with the quality-signaling hypothesis, further analysis is required to identify

whether a signal of risk could also lead to a positive relationship between these variables.

In examining the second hypothesis, this study adds an interaction variable constructed from the product of market capitalization and voluntary lock-up ratio (Eq. (3)) in Table 2 (Panel A). To ensure the interaction variable can be interpreted and fulfills the assumptions of the multiple regression, the interaction model uses the centering method, as suggested by S.Aiken and West (1991). This would avoid the multicollinearity problem. The coefficient of the interaction variable is significant and negative in explaining initial returns such that the second hypothesis is accepted. The result implies that the effect of voluntary lock-up ratio on initial returns depends on the level of information asymmetry. Comparing the coefficient of voluntary lock-up ratio in the regression model that includes the interaction effect, we find that the coefficient of the latter is higher than the former. This reflects that information asymmetry enhances the effect of voluntary lock-up ratio on initial returns. It is also important to note that in the interaction model, the coefficient of risk improves its significance. This finding indicates that the signaling content of voluntary lock-up is more prevalent in firms with high information asymmetry than low information asymmetry.

This study also used the quantile regression method to examine Equation (2) at 3 quantiles, namely the $25^{th}$, $50^{th}$ and $75^{th}$. The quantile regression in Table 3 provides us information on the impact of voluntary lock-up ratio at different levels of initial returns. Based on the findings in Table 3, the results show that there is a significant positive relationship between voluntary and initial returns in all three quantiles. To ease the discussion, we will focus on the finding of the main variable – the voluntary lock-up ratio. By comparing the finding in different quantiles, the coefficient on voluntary lock-up ratio at the $25^{th}$ quantile is higher than the median and $75^{th}$ quantile. The finding suggests that the positive impact of voluntary lock-up ratio is stronger in lower initial returns. This finding seems to be consistent with our argument that firms with higher information asymmetry tend to hold higher voluntary lock-up ratio in order to entice investors to subscribe to the IPOs. However, voluntary lock-up provision does not seem to help in alleviating the uncertainty from the perspective of investors.

To examine the second hypothesis, this study repeats the regression of Equation (2) on sub-samples of large and small firms to gauge the role of lock-up in explaining initial returns of IPOs at different levels of information asymmetry, as shown in Table 4 (Panel B). According to Brav and Gompers (2003), firms with a higher moral hazard problem lock up their shares for a longer period or hold a larger portion of their shares as a form of commitment. Based on the results in Table 4 (Panel A), the voluntary lockup ratio appears to have a slightly greater influence on initial returns in the sub-sample of firms with high information asymmetry. This finding is also further supported in Table 4 Panel (B), where for the robustness test we use size (supply) of the IPO as another proxy for firm's size. Both findings in Panel A and Panel B in Table 4 show that voluntary lock-up ratio is significant and has a greater influence on firms with higher information asymmetry. This finding marginally supports the proposition by Brav and Gompers (2003) that firms with a high degree of uncertainty tend to hold a large portion of the shares during the lock-up period. Similar to the results of the interaction model, the role of risk is more significant in the small firms' sub-sample than that of the large firms.

Based on the evidence thus far, the voluntary lock-up ratio indicates either the signaling quality or risk of the IPO firms. Signaling of quality could be verified if a higher voluntary lock-up ratio results in increased demand for the IPO (Arthurs et al., 2009). As posited by Courteu (1995), quality signaling is evident from the effect of lock-up ratio on demand. When demand for quality IPOs is high, the bid on the price has to be exceptionally high to allure shareholders who are reluctant to sell their IPOs, which subsequently increases initial returns. Although demand (OSR) consistently plays a significantly greater role than risk in explaining initial returns, the indifference in its role throughout the samples only suggests that, *ceteris paribus*, the greater demand imposes additional pressure on the price of IPOs. In order to verify the quality *versus* risk signaling hypothesis, Table 5 (Panel A) reports profiles of firms in low versus high voluntary lock-up ratio (VLR) sub-samples. The results indicate that IPOs with high *VLR* exhibit risk which is only slightly higher than IPOs with low *VLR*. Nonetheless, high *VLR* IPOs report significantly higher demand and considerably higher initial returns.

Although the evidence so far has tended to support the signaling quality hypothesis, the high demand could be due to the small supply of those IPOs. Although small supply could reflect quality if it is due to a large proportion of retained shares, it could be interpreted otherwise when the high *VLR* IPOs are issued by small firms with high information asymmetry and uncertainty. As such, a voluntary lock-up ratio reflects the issuer's commitment to hold the shares as a form of insurance to minimize uncertainty of the IPOs after listing. This is in line with Goergen et al. (2006) and Brav and Gompers (2003), who stated that small and nascent firms, which normally have a greater level of uncertainty, hold on to a larger proportion of their shares. As observed in Table 5 (Panel B), voluntary lock-up ratio is significantly higher for IPOs of small firms than big firms. Small firms also report significantly higher initial returns, investor demand, and risk while at the same time offering smaller IPOs. The high initial returns compensate for the higher risks, and the high demand could be due partly to the involvement of institutional investors (via private placements). Overall, the findings are more lenient towards associating the positive impact of the voluntary lock-up ratio with risk rather than quality signaling.

## 5. Conclusion and Implications

This paper examines the role of voluntary lock-up ratio in explaining initial returns. Employing a data set from 373 IPOs issued by firms listed on Bursa Malaysia between January 2000 and December 2012, this study hypothesizes that the voluntary component of Malaysian IPOs' lock-up ratio is significantly positive in influencing initial returns. Further analysis indicates that the effect of voluntary lock-up provision on initial returns is stronger by having an interaction with information asymmetry as a proxy based upon the size (market capitalization) of the IPO firm. The finding supports the view of the role information asymmetry serves in influencing the relationship between voluntary lock-up ratio and initial returns. Furthermore, using quantile regression, the finding suggests that the influence of voluntary lock-up ratio on initial returns is stronger in the lower initial return quantile. In addition, the finding shows that the voluntary lock-up ratio is higher for IPOs of small firms with a greater degree of uncertainty, and that this leads to higher initial returns among IPOs of small firms. In other words, IPOs are more deeply underpriced to compensate investors for bearing greater risks. Segregating the IPO sample into high and low voluntary lock-up

ratio, this study finds that higher voluntary lock-up ratio is associated with IPO-issuing firms that are significantly smaller and have high information asymmetry. Evidently, the risk of the smaller IPO firms is also higher than that of the larger firms. This strengthens our supposition that voluntary lock-up ratio is more lenient towards signaling risk than the quality of the IPO. As far as quality signaling of the voluntary lock-up ratio is concerned, higher voluntary ratio IPOs tend to be in greater demand. Nonetheless, small firms commonly issue IPOs that are of significantly higher risk than those of large firms. The high demand could be attributable to the involvement of institutional investors. It could also be due to the limited supply of these IPOs.

This study's findings have several important implications. Investors should take cognizance of voluntary lock-up ratio and/or issuers who commit to hold a higher proportion of shares, as this increases investors' chances of obtaining initial returns on IPOs. Regulators have to carefully determine the lock-up provision levels (in the Equity Guidelines), since it has proven to be a factor that is priced by the market. Future research could validate the finding that voluntary lock-up ratio signals risk by examining the long-term performance of IPO firms. Secondly, alternative measures of risks could ensure the robustness of the results. Future studies could also re-examine the effects of information asymmetry. Although this issue is prevalent in developing markets, there is no solid evidence to show that signaling content is stronger in IPOs with higher information asymmetry. The inability to reveal such evidence could stem from two reasons. First, due to the difference in information asymmetry, it might be difficult to share information among companies operating in the same setting or environment. Although accessibility to information among larger firms is better than among smaller firms, information concerning the companies remains somewhat limited, given that IPOs are the first avenue for companies to go public. Second, the proxy of information asymmetry employed in the present study (i.e. size or market capitalization) might not be sufficient to capture the differences in firms' information asymmetry. Moreover, the effect of voluntary lock-up provision has to be examined further, taking into account other elements of the IPO market. Finally, the fact that the models' adjusted R-squared variable is only about 32 percent and the intercepts of the models are consistently significant, means that more factors need to be considered in explaining initial returns.

## References

Allen, F. and Faulhaber, G. R. (1988), "Optimism Invites Deception," *The Quarterly Journal of Economics*, 103(2), 397-407.

Arthurs, J. D., Busenitz, L. W., Hoskisson, R. E. and Johnson, R. A. (2009), "Signaling and initial public offerings: The use and impact of the lockup period," *Journal of Business Venturing*, 24(4), 360-372.

Barclay, M. J. and Clifford W. Smith, J. (1995), "The Maturity Structure of Corporate Debt," *Journal of Finance*, 50(2), 609-631.

Beatty, R. P. and Ritter, J. R. (1986), "Investment banking, reputation, and the underpricing of initial public offerings," *Journal of Financial Economics*, 15(1-2), 213-232.

Bradley, D. J. and Jordan, B. D. (2002), "Partial Adjustment to Public Information and IPO Underpricing," *The Journal of Financial and Quantitative Analysis*, 37(4), 595-616.

Brav, A. and Gompers, P. A. (1999), "Insider Trading Subsequent to Initial Public Offerings: Evidence from Expirations of Lock-Up Provisions," *SSRN eLibrary*.

Brav, A. and Gompers, P. A. (2003), "The Role of Lockups in Initial Public Offerings," *The Review of Financial Studies*, 16(1), 1-29.

Carter, R. and Manaster, S. (1990), "Initial Public Offerings and Underwriter Reputation," *The Journal of Finance*, 45(4), 1045-1067.

Che-Yahya, N., Abdul-Rahim, R. and Yong, O. (2014), "Influence of institutional investors' participation on flipping activity of Malaysian IPOs," *Economic Systems*, 38(4), 470-486.

Courteau, L. (1995), "Under-Diversification and Retention Commitments in IPOs," *The Journal of Financial and Quantitative Analysis*, 30(4), 487-517.

Downes, D. H. and Heinkel, R. (1982), "Signaling and the Valuation of Unseasoned New Issues," *The Journal of Finance*, 37(1), 1-10.

Eldomiaty, T. I. (2008), "Determinants of corporate capital structure: evidence from an emerging economy," *International Journal of Commerce and Management*, 17(1), 25-43.

Fama, E. F. and French, K. R. (1993), "Common risk factors in the returns on stocks and bonds," *Journal of Financial Economics*, 33(1), 3-56.

Gao, F. and Siddiqi, M. A. (2012), "The Rational for IPO Lockup Agreements: Agency or Signaling?," *Review of Pacific Basin Financial Markets and Policies*, 15(3), 125013-120518.

Goergen, M., Renneboog, L. and Khurshed, A. (2006), "Explaining the diversity in shareholder lockup agreements," *Journal of Financial Intermediation*, 15(2), 254-280.

Grinblatt, M. and Hwang, C. Y. (1989), "Signalling and the Pricing of New Issues," *The Journal of Finance*, 44(2), 393-420.

Hakim, T., Lypny, G. and Bhabra, H. S. (2012), "IPO lockup expiration in the Middle East and North Africa," *Journal of Multinational Financial Management*, 22(5), 252-262.

Koenker, R. and Bassett Jr, G. (1978), "Regression quantiles," *Econometrica: Journal of the Econometric Society*, 33-50.

Leland, H. E. and Pyle, D. H. (1977), "Informational Asymmetries, Financial Structure, and Financial Intermediation," *The Journal of Finance*, 32(2), 371-387.

Mohan, N. J. and Chen, C. R. (2001), "Information content of lock-up provisions in initial public offerings," *International Review of Economics & Finance*, 10(1), 41-59.

Mohd-Rashid, R., Abdul-Rahim, R., Hadori, H. and Tanha, F. H. (2013), "IPO Volume, Initial Return, and Market Condition in the Malaysian Stock Market," *American Journal of Economics*, 3(2), 68-74.

Mohd Rashid, R., Abdul-Rahim, R. and Yong, O. (2014), "The influence of lock-up provisions on IPO initial returns: Evidence from an emerging market," *Economic Systems*, 38(4), 487-501.

Mohd Rashid, R., Abdul-Rahim, R., Yong, O. and Nor, A. M., (2013), Lock-up provision and performance of IPOs: Effect of information asymmetry, *Recent Trend in Social and Behaviour Sciences*, (pp. 129), Taylor and Francis Group: London.

Nowak, E., (2004), The Expiration of Mandatory and Voluntary IPO Lock-Up Provisions – Empirical Evidence From Germany's Neuer Markt, In G. Giudici & P. Roosenboom (Eds.), *The Rise and Fall of Europe's New Stock Markets (Advances in Financial Economics)*, (Vol. 10, pp. 181-200), Emerald Group Publishing Limited.

Pagan, A. and Aman, U., (1999), *Nonparametric econometrics*: Cambridge university press.

Ramírez, M. Á. A., Cabestre, F. J. R. and Aquilué, R. S. (2011), "Influence of IPO characteristics on liquidity," *Spanish Journal of Finance and Accounting / Revista Española de Financiación y Contabilidad*, 40(151), 417-437.

Riley, J. G. (1979), "Noncooperative Equilibrium and Market Signalling," *The American Economic Review*, 69(2), 303-307.

Ritter, J. R. and Welch, I. (2002), "A Review of IPO Activity, Pricing, and Allocations," *The Journal of Finance*, 57(4), 1795-1828.

S.Aiken, L. and West, S. G., (1991), *Multiple Regression: Testing and Interpreting Interaction*, United States of America: Sage Publications.

Securities Commission. (1999), "Press Statement on Revised Requirements for Listing, Reverse Take-Overs and Back-Door Listings And flexibilities In The Issue Of Replacement warrants and Fixing of Exercise Prices."

Spence, M. (1976), "Informational Aspects of Market Structure: An Introduction," *The Quarterly Journal of Economics*, 90(4), 591-597.

Su, D. and Fleisher, B. M. (1999), "An empirical investigation of underpricing in Chinese IPOs," *Pacific-Basin Finance Journal*, 7(2), 173-202.

Wan-Hussin, W. N. (2005), "The Effects of Owners' Participation and Lockup on IPO Underpricing in Malaysia," *Asian Academy of Management Journal*, 10(1), 19-36.

Welch, I. (1989), "Seasoned Offerings, Imitation Costs, and the Underpricing of Initial Public Offerings," *The Journal of Finance*, 44(2), 421-449.

Yung, C. and Zender, J. F. (2010), "Moral hazard, asymmetric information and IPO lockups," *Journal of Corporate Finance*, 16(3), 320-332.

# APPENDIX

**Figure 1:** Yearly voluntary lockup ratio (VLR) and initial return (IROPEN)

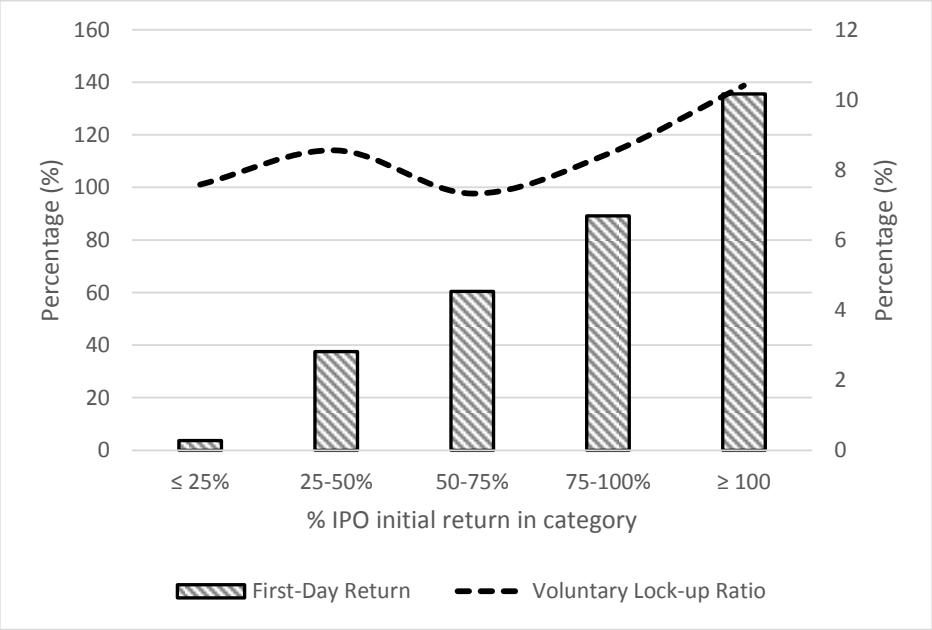

**Table 1**: Descriptive Statistics for the variables of the research

| **Initial Returns in Each Category (%)** | ≤ 25% (*N=226*) | 25-50% *(N=70)* | 50-75% *(N=26)* | 75-100% *(N=22)* | ≥ 100% *(N=29)* | All IPOs (N=373) | Wilcoxon (Z Score) ≤ 25% - ≥100% |
|---|---|---|---|---|---|---|---|
| **IPO Characteristics (Mean)** | | | | | | | |
| DPRIVATE | 0.77 | 0.72 | 0.92 | 0.63 | 0.65 | 0.76 | -1.413 |
| PROCEED (RM mil) | 235.9 | 354.41 | 157.80 | 166.18 | 154.91 | 152.03 | -3.947** |
| PRIV (RM mil) | 230.12 | 170.47 | 233.84 | 156.18 | 173.9 | 21.76 | -0.226 |
| IROPEN | 3.73 | 37.63 | 60.49 | 89.16 | 135.62 | 29.35 | -8.767*** |
| OSR | 16.40 | 38.89 | 50.71 | 64.80 | 75.28 | 30.45 | -5.626*** |
| RISK | 1.54 | 1.52 | 2.44 | 1.95 | 2.25 | 1.68 | -1.777** |
| VLR | 7.58 | 8.55 | 7.32 | 8.45 | 10.40 | 8.02 | -2.416*** |
| MKTCON1 | -0.06 | 1.32 | 2.71 | -0.03 | 2.12 | 0.56 | -2.067*** |
| MKTCON2 | 2.80 | 4.27 | 5.06 | 8.43 | 12.36 | 4.31 | -3.447*** |
| MKTCAP. (RM Million) | 713.9 | 133.36 | 595.81 | 673.87 | 652.77 | 470.04 | -3.6336*** |

Note: DPRIVATE = dummy for issue with private placement, PRIV = private placements, PROCEED= total amount offer, IROPEN= initial return offer to open, OSR= demand, RISK= reciprocal offer price, VLR= voluntary lockup ratio, MKTCON1= market condition during IPO, MKTCON2= market condition prior IPO and MKTCAP= market capitalization.

**Table 2:** OLS regression of the Voluntary Lock-up Ratio on the Initial Returns and Interaction Effect

| Independent Variables | Coefficient | t-statistics | Coefficient | t-statistics |
|---|---|---|---|---|
| | Panel A | | Panel B | |
| VLR | 0.0037 | 2.4046** | 0.0038 | 2.1832** |
| DPRIVATE | -0.1549 | -4.8690*** | -0.1548 | -4.1650*** |
| LNMKTCAP | -0.0396 | -3.0627*** | -0.0494 | -3.4954*** |
| MKTCON1 | 0.0132 | 4.9576*** | 0.0133 | 4.7665*** |
| MKTCON2 | 0.0045 | 4.5119*** | 0.0045 | 3.9133*** |
| OSR | 0.0027 | 8.6867*** | 0.0027 | 7.1821*** |
| RISK | 0.0190 | 1.6553* | 0.0173 | 2.3970** |
| LNMKTCAP*VLR | | | -8.1063 | -3.1915*** |
| C | 0.8855 | 3.4879*** | 1.0653 | 4.0599*** |
| Adjusted R-squared | | 0.3291 | | 0.3298 |
| F-statistic | | 27.0771*** | | 23.883*** |
| Durbin-Watson stat | | 1.7168 | | 1.7257 |
| VIF range | | 1.1-1.4 | | 1.1-1.4 |
| Jarque-Bera residual | | 10.5585*** | | 11.4456 |
| RAMSEY RESET (F-statistic) | | 0.8416 | | 0.4227 |

Notes: ***,**,* indicate significance at 1%, 5% and 10% respectively (N=373).

**Table 3:** Quantile Regressions of the Voluntary Lock-up Ratio on the Initial Returns

| Independent Variables | Coefficient | t-statistics | Coefficient | t-statistics | Coefficient | t-statistics |
|---|---|---|---|---|---|---|
| | 25th Quantile | | 50th Quantile | | 75th Quantile | |
| VLR | 0.0016 | 1.8302* | 0.0022 | 1.6928* | 0.0033 | 1.6741* |
| DPRIVATE | -0.0357 | -1.4673 | -0.1065 | -4.1060*** | -0.2923 | -4.8836*** |
| LNMKTCAP | -0.0232 | -1.7536* | -0.0312 | -3.3034*** | -0.0562 | -5.2494*** |
| MKTCON1 | 0.0021 | 2.3528*** | 0.0025 | 2.5557*** | 0.0045 | 4.2133*** |
| MKTCON2 | 0.0087 | 3.0376*** | 0.0109 | 4.0893*** | 0.0143 | 3.3581*** |
| OSR | 0.0022 | 8.3367*** | 0.0032 | 9.7577*** | 0.0031 | 6.3212*** |
| RISK | -0.0084 | -0.5652 | 0.0097 | 0.7045*** | 0.0222 | 1.7489* |
| C | 0.0016 | 1.7548* | 0.0022 | 1.6928*** | 0.0033 | 6.1050*** |
| Pseudo R-squared | | 0.1268 | | 0.2059 | | 0.2484 |
| Observations | | 373 | | 373 | | 373 |

Notes: ***,**,* indicate significance at 1%, 5% and 10% respectively. Chamberlain's bandwidth and Epanechnikov kernel function estimation is use for quantile regressions.

**Table 4:** OLS regression of sub-samples of size factor

| Dependent variables: IROPEN | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Panel A (Market Capitalization) | | | | Panel B (Total Size of Issues) | | | |
| | Big Firms = Low IA | | Small Firms = High IA | | Big Firms= Low IA | | Small Firms= High IA | |
| Ind. Variables | Coefficient | t-statistics | Coefficient | t-statistics | Coefficient | t-statistics | Coefficient | t-statistics |
| VLR | 0.0042 | 2.9107*** | 0.0044 | 2.9379*** | 0.5641 | 2.5667*** | 0.5841 | 2.6356*** |
| DPRIVATE | -0.1343 | -4.0102*** | -0.1357 | -4.0587*** | -19.9423 | -4.1465*** | -19.9458 | -4.0971*** |
| DSIZE | -0.0579 | -2.0920** | 0.0085 | 0.2265 | -10.4449 | -2.9173*** | 8.1897 | 1.8148* |
| MKTCON2 | 0.0043 | 3.7390*** | 0.0044 | 3.8225*** | 0.5957 | 3.6339*** | 0.6413 | 3.7830*** |
| MKTCON1 | 0.0129 | 4.5449*** | 0.0131 | 4.5405*** | 1.6817 | 3.8493*** | 1.6941 | 3.9317*** |
| OSR | 0.0027 | 6.94245*** | 0.0028 | 7.2559*** | 0.4132 | 6.1127*** | 0.4242 | 6.3762*** |
| RISK | 0.0235 | 1.8717* | 0.0285 | 2.0138** | 3.4074 | 1.8553** | 3.4657 | 1.9528** |
| C | 0.1471 | 4.0581*** | 0.1145 | 3.5382*** | 21.3248 | 4.1955*** | 14.8793 | 3.3498*** |
| Adjusted R-squared | | 0.3190 | | 0.3120 | | 0.3370 | | 0.3325 |
| F-statistic | | 25.8983*** | | 25.1064*** | | 28.0192 | | 27.4786 |
| Durbin-Watson stat | | 1.6917 | | 1.6785 | | 1.9500 | | 1.9355 |
| VIF range | | 1.1-1.5 | | 1.1-1.9 | | 1.1-1.2 | | 1.0-1.3 |
| Jarque-Bera residual | | 9.3278*** | | 8.7643*** | | 8.8212*** | | 10.4564*** |
| RAMSEY RESET (F-statistic) | | 0.4232 | | 1.0595 | | 0.8287 | | 0.7164 |

Notes: ***, **,* indicate significance at 1%, 5% and 10% respectively (N=373).

**Table 5:** Profiles of IPOs based on voluntary lockup ratio and firms size

| | High VLR (Mean) | Low VLR (Mean) | High vs Low (Z score) | Small Firms (Mean) | Big Firms (Mean) | Small vs Big (Z score) |
|---|---|---|---|---|---|---|
| VLR (%) | 18.77 | 0.02 | -13.611*** | 9.40 | 7.08 | -3.395*** |
| PRIVATE (%) | 47.08 | 41.46 | -1.035 | 64.18 | 36.38 | -6.101*** |
| PROCEED (RM Million) | 54.36 | 422.07 | -5.682*** | 10.29 | 471.38 | -12.407*** |
| IROPEN (%) | 36.60 | 15.61 | -4.037*** | 39.43 | 14.14 | -4.978*** |
| OSR (ratio) | 35.13 | 18.20 | -2.840*** | 43.26 | 13.57 | -5.968*** |
| RISK (%) | 1.79 | 1.56 | -1.178 | 2.75 | 0.99 | -10.213*** |
| MKTCON1 (%) | 0.11 | 0.44 | -0.268 | 1.15 | 0.25 | -1.460 |
| MKTCON2 (%) | 1.80 | 6.08 | -2.281** | 3.89 | 2.78 | -0.613 |
| MKTCAP (RM Million) | 194.55 | 1,260.76 | -4.331*** | 41.54 | 1,425.54 | -12.933*** |

Notes: ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Categorization into sub-samples is based on voluntary lock-up ratio and market capitalization. Since the data are not normally distributed, the present study applies the non-parametric Mann-Whitney *U* to test for differences between two groups.