Substantial Shareholders and Their Trading Behaviour around Lock-Up Expiry: Evidence from Emerging Markets

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Abstract: This paper examines the effects of substantial shareholders' trading behaviour on share prices, trading volume and bid–ask spread in relation to the efficient market hypothesis (EMH) around the lock-up expiry for a sample of 379 Malaysian IPOs, between 2001-2011. Our analysis shows that the number of companies with substantial institutional and individual shareholders has increased after the IPO. This indicates that individual and substantial investors are optimistic about the future of the IPO companies in general. In addition, the number of existing substantial individual and institutional shareholders that sold their shares is greater than the existing substantial individual and institutional shareholders that bought shares. That is the reason why we witness an abnormal trading volume and abnormal bid–ask spread, which leads to abnormal returns. The two other categories, 'new individual investors that came in as substantial shareholders after lock-up expiry' and 'new institutional investors that came in as substantial shareholders after lock-up expiry', show that some investors are still optimistic about the future of these IPO companies. Our analysis shows an increase in trading volume before the lock-up expiry date by substantial shareholders, which is an indicator of illegal insider trading. Consequently, market makers to protect themselves would increase the spread, which results in a price drop. Significant cumulative average abnormal returns show inconsistency about the EMH. The results are vital to provide input into the enforcement of laws to regulate insider trading. This is to strengthen the legal regimen to prevent the influences of insider trading.

Keywords: Lock-up provision, Malaysian IPOs, abnormal return, bid–ask spread, trading volume, Efficient Market Hypothesis.
JEL classification: G02, G10, G14, G18, G38

1. Introduction

Initial public offerings (IPOs) universally and domestically (in Malaysia) have recorded high initial returns for institutional and individual investors over the decades (Bradley and Jordan, 2002; Low and Yong, 2011; Yatim, 2011). There are several studies related to the performance of IPOs, e.g., the influence of the lock-up provisions on IPO's initial return or influence of lock-up provision on flipping activity. The missing piece of the IPO puzzle is the trading behaviour of shareholders around one of the most crucial events of the IPO market, which is called the lock-up expiry date. Hence lock-up is one of the main variables that mainly impacts on IPOs' performance (Mohan and Chen, 2002). Therefore the study of IPOs without study of the performance of IPOs around lock-up expiry is incomplete. Lock-up provision, commonly known as share moratorium in Malaysia or lock-in in the United Kingdom (UK),

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is the period of time that is imposed on controlling shareholders, which prevents them from selling their shares after the issuance of the IPO.

The reason behind lock-up provision is to mitigate the moral hazards and asymmetric information among IPO participants (Yung and Zender, 2010). Brav and Gompers (2003) and Mohan and Chen (2002) cite that the form of the lock-up contract shows the amount of the adverse selection and moral hazard phenomenon among IPO participants. In some countries (e.g. United States, UK) the form of the lock-up agreement is negotiable between underwriter(s) and issuer, but this is not the case in Malaysia. The form of the lock-up provision in Malaysia, in terms of its duration and locked-up shares by insiders, is fixed and mandated by Security Commissions (SC). Hence the duration of the lock-up provision in Malaysia cannot be a significant indicator of moral hazards and information asymmetries among the IPO participants as we cannot predict their trading behaviour around lock-up expiry. Despite this drawback, significant trading by substantial shareholders around IPO and lock-up expiry would be a substantial indicator of the true value and future prospect of the company, as they have access to the insider information that affects their trading behaviour.

In Malaysia, since the most general IPO pricing mechanism is a fixed-price offering (as opposed to book building and auction), the level of information asymmetries among IPO investors are arguably high and investors cannot perceive the true value of the IPO, as suggested by Ma (2007). This also means that the divergence in opinion among IPO substantial shareholders (insiders) regarding the prospects of the company is likely to be high. Although these opinions are not observable, they are important because shareholders' aftermarket behaviours are essentially driven by their opinions or expectations about the new issue. Shareholders (investors) with heterogeneous opinions and beliefs will show different behavioural trends when the IPO issue begins trading. This in turn will influence the performance of IPO equities in the short and long-runs, which would encourage flipping activity, illegal insider trading and significant trading around lock-up expiry.

A recent study by Che-Yahya et al. (2014a) shows a negative relationship between institutional investors' participation and the flipping activity of Malaysian IPOs. Institutional investors are normally assumed to be long-term investors and less likely to flip their allocated IPOs in the immediate aftermarket (Che-Yahya et al., 2014a). If flipping activity is done excessively it could produce a damaging effect on the aftermarket performance of the new shares (Che-Yahya et al., 2014b). This means that institutional shareholders in terms of keeping their shares for a longer period of time are more loyal than individual shareholders to the company. While stopping and controlling investors from flipping their shares is not a choice legally, the decision by the SC of Malaysia to impose a mandatory lock-up provision is seen as an effort that could control the flipping activities to a certain extent. Hence controlling shareholders would keep their shares after the IPO until the first subsequent sale opportunity, which is the lock-up expiry date.

On the other hand, a study by Goergen et al. (2010) relating to behaviours of shareholders around lock-up expiry shows a significant increase in trading volume and bid–ask spread and no significant change of share price. The significant trading volume and bid–ask spread around lock-up expiry were not strong enough to move the Hong Kong IPO price from its efficiency. The absence of significant abnormal returns around the lock-up expiry event confirms the semi-strong form of the efficient market hypothesis (EMH). The reason given by Goergen et al. (2010) for the absence of a price reaction around lock-up expiry is that most of the Hong Kong IPO firms are controlled by one or two non-institutional shareholders (individual) who choose not to sell their shares after the lock-in expiry.

Based on a study by Che-Yahya et al. (2014a), institutional shareholders are more loyal to a company in the longer term; in contrast, a study by Goergen et al. (2010) mentions that individual shareholders are more loyal to a company and will keep their shares for a longer

time. Putting this contradiction along with a fixed-price mechanism, fixed duration and fixed percentage of shares under the lock-up provision, we intend to analyse the behaviour of an individual and of institutional shareholders around the lock-up expiry of Malaysian IPOs.

Our study will narrow down the sample to substantial shareholders: as they are considered insiders and have access to insider information that will affect their trading behaviour (Brau *et al.*, 2004) and eventually the performance of the IPO. Their trading will have an effect on price, trading volume and bid–ask spread of the IPO shares around the lock-up expiry, which would allow us to test the EMH as we expect all the related information has already been incorporated into the share price. This study attempts to find the distribution of companies with substantial institutional and individual shareholders before and after the IPO in order to compare it with their trading pattern activity around lock-up expiry. In addition, we intend to find a number of new individuals and institutional shareholders that came in as substantial shareholders around the lock-up expiry.

The main driver of doing this research is that, according to Malaysia's Vision 2020, it should achieve the status of a developed country, in terms of financial and social developments, by the year 2020. As a consequence of the Vision 2020 plan, Malaysia's financial market should become a developed financial market with regards to information availability and transparency.

According to studies by Brau and McQueen (2000), Brav and Gompers (2000), Ofek and Richardson (2000), Bradley *et al.* (2001) and Field and Hanka (2001) for the US IPOs market due to insider selling, the price of shares drops and the trading volume increases around lock-up expiry. Price drop around lock-up expiry is inconsistent with the semi-strong form of the EMH, as information related to the lock-up expiry has already been published in the prospectus of a company and is considered as accessible public information. Hence, based on the EMH, lock-up expiry should not have a severe impact on share price (Fama, 1991). One of the main reasons for negative abnormal returns around lock-up expiry is an increase in bid–ask spread induced by market makers to protect themselves against informed insider traders (Field and Hanka, 2001; Cao *et al.*, 2004). In addition to the price drop there is a trading volume increase around lock-up expiry in the United States, European countries and Malaysia (Ofek and Richardson, 2000; Espenlaub *et al.,* 2001; Zameni and Yong 2016), as lock-up expiry is the first exit opportunity for insiders to free up their tied up capital.

A recent study by Zameni and Yong (2016) shows a significant positive abnormal trading volume around lock-up expiry, related to the Malaysian IPO market. High trading volumes at and around the lock-up expiry date is compatible with shareholders' selling due to diversification reasons and wealth recognition: these high trading volumes could be an indication of insiders' lack of confidence about a company's future prospect.

The present study is motivated by the unique structures of the Malaysian IPO market, as opposed to those of the developed markets where empirical evidence on lock-up expiry is mostly established. Unlike those developed markets, e.g. the United States, UK, Australia and Finland, where lock-up provisions are voluntary, the SC imposes compulsory lock-up provision on Malaysian IPOs. In addition, most Malaysian IPOs are issued through a fixed-offer price mechanism. In short, these differences provide valid reasons to believe that the behaviour of lock-up expiry in Malaysia is different than that found in the developed countries and so are the factors that influence the trading behaviour of the substantial shareholders in this market. Furthermore, Islam and Munira (2004) cite that the securities markets in developing countries differ from those of developed countries with respect to investors' behaviour, size of market and, particularly, the regulatory framework. Another motivation of our study relies on the conclusion of the study by Leland and Pyle (1977) and Brau *et al.* (2004). Leland and Pyle (1977) cite that the level of insiders' participation in financial activities of the company carries information. Moreover, Brau *et al.* (2004) assert that when

insiders (substantial shareholders) sell large amounts of their personal stocks, this sends a negative signal to outsiders.

To the best of our knowledge our study is different than other IPO studies in Malaysia – as other researchers by utilising the Malaysian data have concentrated on the trading volume behaviour of the IPO market after lock-up expiry (Zameni and Yong, 2016) or on the performance of an IPO itself (e.g. Abdul-Rahim *et al.*, 2013; Sapian *et al.,* 2013; Che-Yahya and Abdul-Rahim, 2015). Other studies, such as Wan-Hussin (2005), concentrate on owners' participation and level of under-pricing.

Our main contribution is to find the trading behaviours of the substantial shareholders around lock-up expiry, as they are considered insiders and their significant trading would have an impact on the share price and performance of the IPO. For fulfilling this objective we narrow down the sample to substantial shareholders' trade around lock-up expiry. The reason for narrowing down the sample is based on a study by Chemmanur (1993). According to Chemmanur's (1993) information production model, when insiders perceive value in the company, they decide to sell equities both in the IPO and in the seasoned equity offering (SEO). Substantial shareholders' selling around lock-up expiry is a signal to the IPO market regarding the future of the company – as shareholders have access to crucial (insider) information. As there is no database to record the insider and substantial shareholder activity in Malaysia, we have gone through the companies' prospectuses and annual reports and manually collected the related data. We expect a bid–ask spread increase, consequently price decrease and trading volume increase around lock-up expiry – as this is the main event through which substantial shareholders can reveal their real evaluation of a company.

The significance of our study is based on the results of research by Benveniste and Spindt (1989), who presume that certain investors, such as institutional investors, are more informed than the company and underwriter, and therefore suggest that book building causes the institutional investors to declare their information. But in Malaysia the common IPO pricing mechanism is a fixed-price mechanism, which causes a high level of uncertainty and information asymmetry among investors. This is the main reason why we segregated our sample into individual and institutional investors. Many other studies have segregated their samples into venture capital (VC) and non VC-backed companies. Venture capital companies are considered as insiders to the company. Venture capital- backed industry is quite new in Malaysia and there is a paucity of data related to it (Ajagbe and Ismail, 2014).

The sample of the study comprises 379 Malaysian IPOs, issued from January 2001 to December 2011. Thus the EMH is investigated in relation to lock-up provision by using the standard event study methodology. Our analysis shows that the number of companies with substantial institutional and individual shareholders has increased after the IPO. This indicates that individual and substantial investors are optimistic about the future of the IPO companies and economics in general. In addition, the number of existing substantial individual and institutional shareholders that sold their shares is greater than the existing substantial individual and institutional shareholders who bought shares. That is the reason why we witness an abnormal trading volume and abnormal bid–ask spread that leads to an abnormal return around lock-up expiry. The two other categories as the name of "New individual and New institutional investors that came in as substantial shareholders after the lock-up expiry" show that some investors are still optimistic about the future of these IPO companies. Our analysis shows increase in trading volume before lock-up expiry by substantial shareholders, which is an indicator of illegal insider trading. Consequently, market makers in order to protect themselves would increase the spread, which results in price drop. Significant cumulative average abnormal returns (CAARs) show inconsistency about the EMH.

2. Literature Review

Brav and Gompers (2003) propose that insiders can signal the quality of a company using three tools: under-pricing, the portion of stocks locked-up and the duration of the lock-up. A high quality issuer mostly under-prices more, locks-up for a longer duration or locks-up a bigger portion of outstanding stocks.

Many researchers argue that lock-up agreements mitigate the information asymmetry between the outside shareholders and the insider managers (Brau *et al.*, 2004). Furthermore, Ibbotson and Ritter (1995) cite that investors are ready to pay a higher price for a company with a lock-up contract due to the following two reasons: firstly, confidential negative information is likely to be revealed prior to the selling of retained stocks, thus mitigating the advantage of confidential information; secondly, as long as insiders keep huge amounts of shares, their motives are in lieu of outsiders' motives. Consistent with these results, an analytical study reports that retained ownership by insiders at the date of the IPO is positively related to company value (Downs and Heinkel, 1982; Ritter, 1984a). Analytically, many researchers argue that insiders refrain from selling stocks during the lock-up period for fear of transferring negative signals to the share market (Brau and Fawcett, 2006). Since substantial selling activity happens prior to the lock-up duration (Brav and Gompers, 2003), insiders wait until the lock-up contract expires to mitigate the kept shares in their IPO.

Brav and Gompers (2003) examine 2,794 US IPOs between 1988 and 1996, and find that under-pricing is higher for companies with a larger fraction of the shares outstanding subject to liquidity restrictions. They also show that opaque or less transparent companies, which are associated with greater informational asymmetries, have longer lock-ups.

The reaction of the share price at and around lock-up expiry has been examined recently. Some research regarding lock-up expiry on the US IPO market shows a market reaction at and around the expiry (Brau and McQueen, 2000; Brav and Gompers, 2000; Ofek and Richardson, 2000; Bradley *et al.,* 2001; Field and Hanka, 2001). These researchers report significant abnormal returns (ARs) of between –1 and –3% surrounding the lock-up expiry for the US IPO market. Since the information about the attributes and characteristics of the lock-up is public information at the time of the IPO, the significant price movement at and around lock-up expiry is not consistent with the semi-strong version of the EMH (Fama, 1991). In line with the above argument we hypothesise:

H1: The abnormal returns are not significantly different from zero for substantial shareholders' trade around lock-up expiry.

Aggarwal *et al.* (2002) cite that under-pricing of IPOs is positively associated with insider retaining of equities at the IPOs. Moreover, their model argues that under-pricing of IPOs is positively associated, through information drive, with insider sale of stocks at lock-up expiry. However, concentrating only on the lock-up expiry date is ambiguous. Brav and Gompers (2003) report that 60% of companies have insider sales before the lock-up expiry date; and Lee (1997) shows substantial insider sales during seasoned equity offering. Aggarwal *et al.* (2002) propose several plausible interpretations for these outcomes. Firstly, manager/owner risk aversion is a probable interpretation for why companies like to under-price in ensuring that the IPO is beneficial. Furthermore, there are managers/owners who like to sell more at lock-up expiry in order to diversify their holdings. Secondly, the asymmetric information of Welch (1989) states that high quality companies under-price IPOs for the sake of earning greater prices in the SEO. Moreover, this model also applies to insider sales where quality companies under-price the IPO to get better prices at lock-up expiry. Thirdly, Chemmanur (1993) asserts that the manager/owner of a high quality company under-prices the IPOs to compensate investors for gathering information about the company. A main finding of

Chemmanur's (1993) model is that higher under-pricing is linked to reduced gross proceeds from the IPOs. From the behavioural financial perspective, Goldberg and Nitzsch (2001) posit that asset price and its fluctuation show the behaviour of market players, and this behaviour is a reflection of investors' understanding of information earned and opinions formed following such understanding. Actually, in the IPO context, investors' knowledge and information about the IPO will influence their behaviour and, as a result, differences in investors' opinions or expectations will influence the performance of IPO equities. Consequently, in line with these arguments, we intend to find the distribution of companies with one, two, three and more than three substantial individual and institutional shareholders before and after the IPO and analyse their trading patterns and also hypothesise:

H2: The abnormal returns at the lock-up expiry date are significantly negative for substantial shareholders' trade around lock-up expiry.

Mostly, investing IPOs may show abnormal trading activities after lock-up expiry as an index of insider confidence. Hence, heavy sale by insiders instantly after lock-up expiry is understood as a signal of low insider confidence. This is explained to be a bad signal related to the prospects of companies. On the other hand, if there are no abnormal changes in insider trading volume subsequent to lock-up expiry, this is seen by investors as a signal of high insider confidence and thus a positive index of future company value. In line with this line of argument we hypothesise:

H3: The abnormal volume around the unlock day is significantly positive for substantial shareholders' trade around lock-up expiry.

Since insiders possess information regarding the firm's future prospects, their information pushes them forward for trading, based on possessed information or for liquidity. Information traders can benefit from the possession of important information around the unlock day. The reason for the sale of the shares by liquidity traders is to disperse their invested wealth. Recognising the information and liquidity of traders around the unlock day is impossible. As a consequence, market makers intensify the information rent to prevent losses at the moment of trade with informed traders. On the other hand, the unlock day is supposed to be related to the supply of shares by insiders. This result is earned by the test of the effect of the unlocking day on the bid–ask spread of locked shares (Field and Hanka, 2001; Cao *et al.,* 2004). Bid–ask spread has the following elements: asymmetric information, inventory and order processing. The asymmetric information element can help to forecast the proposed hypotheses of the study. Stoll (1978) explains the reason for changes on the inventory element of the bid–ask spread. He cites that market makers are forced to separate their inventory positions from their optimum target for holding equilibrium in inequalities of order. In addition, high trading volume after the expiry date gives market makers the chance for early substitution of their inventory, thus creating a negative association between bid–ask spread and trading volume (Demsetz, 1968). The last component of the bid–ask spread is order processing cost, which has several elements. These elements are exchange and clearing fees; book-keeping and back office costs; market makers' time and effort, etc. Basically, because of some fixed costs of these elements and also heavy trades around unlock day, the order processing cost must be decreased. Stock spreads reflect, among other things, the degree of information heterogeneity among traders (Fedenia and Grammatikos, 1992). Goergen *et al.* (2010) show that the bid–ask spread increases significantly around lock-up expiry. We argue that a wider spread is likely to be caused by potential sales by insiders, and the risk for market

makers to end up trading with better informed insiders. Putting all the arguments together, we hypothesise:

H4: The abnormal bid–ask spread surrounding the unlock day for substantial shareholders' trade around lock-up expiry is significantly positive or negative.

3. Research Methodology
3.1 Sample and Procedures
The sample used in this study comprises 379 Malaysian IPOs listed on the Main Board, Second Board, MESDAQ, Main Market and the ACE Market with the lock-up provision, covering a period from January 2001 to December 2011. January 2001 is chosen as the start date since the after-effects of the 1997 Asian financial crisis had faded by this time. In addition, this sample period allows us to study the microstructure effect of the lock-up provision of Malaysian IPOs when the mandatory lock-up provision began to be imposed on 3 May 1999. In a similar way to Abdul-Rahim and Yong (2008, 2010) and Yong (2007a), the present study selects a sample of IPOs that are offered as: a public issue; offer for sale; private placement; and a hybrid of the aforementioned forms. The selection criteria essentially excluded special purpose IPOs, such as restricted offers for sale; restricted public issues; restricted offers for sale to eligible employees; restricted offers for sale to Bumiputra investors; special and restricted issues to Bumiputra investors; tender offers; and special issues. Special purposes IPOs are rare and including them may lead to a less meaningful outcome (Abdul-Rahim and Yong, 2008; Yong, 2007a). IPOs issued under the real estate investment trust (REITS) category are excluded due to the different formats of presentation of their financial statements. The reason to exclude these companies with uncommon types of offer, is due to the fact that the number of companies with these issues is very small, leading to less meaningful outcomes as suggested in Abdul-Rahim and Yong (2010) and Yong (2007b). This study defines the event horizon as the (−20, +20 days) time period surrounding the lock-up expiry date, in line with the event horizon used in studies such as Goergen *et al.* (2010) and Ofek and Richardson (2000) and to better capture lock-up expiry effects. We chose this definition in preference to longer windows to avoid possible confounding events. For presenting the performance of the Malaysian equity market, the EMAS index has been chosen. The data employed in this research were collected from the Bursa Malaysia website (www.bursamalaysia.com), the SC website (www.SC.com.my), the Star Online website (http://biz.thestar.com.my/marketwatch/ipo), the www.klse.info website and Datastream. In addition, data related to the distribution of substantial shareholders before and after IPO issuance from 2001 to 2011 and the distribution of substantial shareholders after first lock-up expiry from 2001 to 2011 have been collected manually from prospectus and annual reports.

3.2 Method
This section explains the methodology that is used to calculate and test the effects of price around lock-up expiry date. Lock-up expiry date is considered as an event date.

3.2.1 Analysing Abnormal Returns
An event study analysis is used to assess the stock price reactions to firm-specific events (Binder, 1998; Fama, 1998). The market model is a standard model used in event studies when it comes to calculating abnormal returns (Dimson, 1979; Field and Hanka, 2001).

The market model coefficients are obtained from the regression of the security returns against the corresponding market index. The ARs of each stock are calculated as the residuals of the model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{1}$$

where R_{it} is the return of firm i on day t; R_{mt} is the return on the market portfolio at day t, ε_{it} ε_{it} is a residual term and the event period is equal to (–20, +20). In analysing ARs, it is normal to mark the event date as t = 0, and $AR_{i,0}$ represents the ARs on the event date. By using the daily average abnormal returns (AAR_t) and the cumulative average abnormal returns ($CAAR_{(t1,t2)}$) over the (t1, t2) period, we can measure the price effect of the expiry date.

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it} \tag{2}$$

$$CAAR = \frac{1}{N} \sum_{i=1}^{N} CAR_i \tag{3}$$

AAR_t = daily average abnormal returns; AR_{it} = abnormal return of firm i on day t; N = sample size. The significant deviation of the AARs from zero shows abnormal performance.

$$CAR_i = \sum_{t=t1}^{t2} AR_{it} \tag{4}$$

CAR_i = Cumulative abnormal return of firm i.

Goergen *et al.* (2010) used the following statistical test to evaluate the significance of AAR_t and $CAAR_{(t1,t2)}$ in their study:

$$test_1 = \frac{AAR_t}{S_t/\sqrt{N}} \tag{5}$$

$$test_2 = \frac{CAAR_{(t1,t2)}}{S_{t1,t2}/\sqrt{N}} \tag{6}$$

where

$$S_t = \sqrt{\frac{1}{N-1} \sum_{i=1}^{N} (AR_{it} - AAR_t)^2} \tag{7}$$

$$S_{t1,t2} = \sqrt{\frac{1}{N-1} \sum_{i=1}^{N} [CAR_1(t1,t2) - CAR(t1,t2)]^2} \tag{8}$$

The statistics, test1 and test2 are Student's t-distributions with N − 1 degrees of freedom.

3.2.2 Analysing Abnormal Volume
Goergen *et al.* (2010), in their paper on the Hong Kong IPO market, applied the following equations for measuring abnormal daily trading volume around the unlock day:

$$VR_{it} = \frac{\dfrac{V_{it}}{V_{mt}}}{\dfrac{1}{52} \left[\sum_{t=-100}^{-49}\left(\dfrac{V_{it}}{V_{mt}}\right)\right]} \tag{9}$$

This equation is used to calculate the market adjusted volume ratio, VR_{it} of firm i on day t. In this formula, V_{it} is the trading volume of firm i and V_{mt} is the market index on day t. The V_{mt} can be downloaded from the Datastream database. AVR_t is a daily average abnormal volume across N companies:

$$AVR_t = \frac{1}{N} \sum_{i=1}^{N} VR_{it} \tag{10}$$

and, $MAVR_s$ is the average abnormal volume for N companies in the event window (t1, t2), where S is:

$$S = t_2 - t_1 \tag{11}$$

$$MAVR_s = \frac{1}{s} \sum_{t=T1}^{T2} AVR_t \tag{12}$$

respectively.

For testing the AVR_t and $MAVR_s$, the standard t-test is applied. If the AVR_t and $MAVR_s$ are greater than one, the trading volume on day t over the event window is abnormal.

3.2.3 Analysing the Bid–Ask Spread Effect

For understanding whether the ARs around the expiry day are because of variations in the trading costs, we employ the methodology that has been used by Goergen *et al.* (2010) and Fedenia and Grammatikos (1992). This methodology is able to capture the asymmetric component of the bid–ask spread, which we are looking for. The formula below measures the abnormal relative market-adjusted spread ratio of each firm i:

$$ARS_{it} = \frac{\dfrac{RS_{it}}{RS_{mt}}}{\dfrac{1}{52} \sum_{t=-100}^{-49} \left(\dfrac{RS_{it}}{RS_{mt}}\right)} \tag{13}$$

RS_{it} is the symbol for the relative spread of company i on day t, and, RS_{mt} is the spread of the market portfolio (where m represents the number of companies in each different Board, sector and IPO market). For measuring the RS_{it}, we employ the following equation:

$$RS_{it} = \frac{PA_{it} - PB_{it}}{(PA_{it} + PB_{it})/2} \tag{14}$$

and for calculating the RS_{mt} , the following equation is used:

$$RS_{mt} = \frac{1}{M} \sum_{i=1}^{M} RS_{it} \tag{15}$$

In Equation (14), PA_{it} and PB_{it} are the closing ask and bid prices of company i on day t, respectively. The formula for daily average market-adjusted abnormal spread ($AARS_t$) across N firms is (Goergen *et al.,* 2010):

$$AARS_t = \frac{1}{N}\sum_{i=1}^{N} ARS_{it} \qquad (16)$$

Also, the average market adjusted relative spread ($MAARS_s$) across N companies in the event window of (t_1, t_2) with the length of S ($S = t_2 - t_1$), is calculated as:

$$MAARS_S = \frac{1}{S}\sum_{t=T1}^{T2} AARS_t \qquad (17)$$

The standard t-test is used to test the $AARS_t$ and $MAARS_s$ over day t and window (t1, t2). If they significantly differ from one over the expiry day and event window, it means there is an abnormal relative spread.

4. Data Analysis
The preliminary results highlight the characteristics of variable, basic profiles and the descriptive statistics. The highlighted characteristics are related to the Malaysian IPO market.

4.1 Profiles of the IPO Sample
Table 1 shows the number of companies in each Board between January 2001 and December 2011. Total number of companies for Main, Second, MESDAQ Boards and Main and ACE Markets is 379 between the years 2001 and 2011.

Table 1: Number of companies in each Board

Panel A	Main Board	Second Board	MESDAQ	Total
2001	6	14	-	20
2002	19	16	8	43
2003	17	18	14	49
2004	14	23	26	63
2005	10	16	41	67
2006	3	7	22	32
2007	10	8	2	20
2008	7	8	8	23
Total	86	110	121	317
Panel B[†]	Main Market		ACE Market	
2009	11		2	13
2010	21		6	27
2011	12		10	22
Total	44		18	379

4.2 Distribution of Substantial Shareholders Before and After the IPO from 2001 to 2011
According to Section 69 of the Malaysia Companies Act 1965, a substantial shareholder is described as 'a person that has a stake in one or more voting stocks in a firm, where the nominal volume of that share (or the aggregate of the nominal amounts of those stocks) is not less than five percent of the aggregate of the nominal amounts of all the voting stocks in the firm.'

[†]After 3 August 2009, the structure of Bursa Malaysia changed from three Boards: Main, Second and MESDAQ Boards to the Main and ACE Markets, respectively. The number of companies before 3 August 2009 for Main and Second Boards is 10 and 1, respectively.

Table 2: Distribution of substantial shareholders before and after IPO issuance from 2001 to 2011 (from prospectuses)

	Number	Percentage
Panel A		
Companies with one substantial shareholder	26	6.9
Companies with two substantial shareholders	59	15.6
Companies with three substantial shareholders	44	11.6
Companies with more than three substantial shareholders	250	65.9
Panel B		
Companies with institutional shareholders before the IPO	284	74.6
Companies without institutional shareholders before IPO	95	25.4
Panel C		
Companies with institutional shareholders after the IPO	287	75.7
Companies without institutional shareholders after IPO	92	24.3
Panel D		
Number of institutional shareholders (one) before the IPO	114	30.1
Number of institutional shareholders (one) after the IPO	105	27.7
Number of institutional shareholders (two) before the IPO	81	21.4
Number of institutional shareholders (two) after the IPO	88	23.1
Number of institution more than two shareholders before the IPO	184	48.6
Number of institution more than two shareholders after the IPO	186	49.1
Panel E		
Number of companies with individual shareholders before the IPO	269	71.1
Number of companies with individual shareholders after the IPO	298	78.6
Number of companies with individual shareholders (one) before the IPO	39	10.4
Number of companies with individual shareholders (one) after the IPO	29	7.5
Number of companies with individual shareholders (two) before the IPO	68	17.9
Number of companies with individual shareholders (two) after the IPO	80	20.8
Number of companies with individual shareholders (more than two) before the IPO	162	42.8
Number of companies with individual shareholders (more than two) after the IPO	189	49.7

Table 2, which consists of Panels A, B, C, D and E, shows the distribution of substantial shareholders before and after the IPO, from January 2001 until December 2011, in Malaysia's equity market. As can be seen in Panel A, 250 companies have more than three substantial shareholders, (65.9%). The companies with one substantial shareholder total 26 (6.9%).

Panel B shows there are 284 companies (74.6%) with institutional shareholders before the IPO. Panel C shows there are 287 companies (75.7%) with institutional shareholders after the IPO.

Panel D shows the number (one, two and more than two) of institutional shareholders before and after the IPO. Actually the number of (one) institutional shareholders decreases from 114 to 105 (30.1 to 27.7%) after the IPO. In contrast, the number of (two) institutional shareholders increases from 81 to 88 (21.4 to 23.1%), after the IPO. In addition, there is not much difference between the number of institutional (more than two) shareholders before and after the IPO. The number of institutional (more than two) shareholders increased slightly from 184 before the IPO (48.6%) to 186 after the IPO (49.1%).

Panel E shows the number of individual shareholders before and after the IPO. The number of companies having only individual shareholders increased from 269 to 298 (71.1 to 78.6%) after the IPO. The number of companies that had one individual shareholder reduced from 39 to 29 (10.4 to 7.5%); in contrast, the number of companies that had two individual shareholders increased from 68 to 80 (17.9% to 20.8%) after the IPO. In addition, the number

of companies with individual shareholders (more than two) rose from 162 to 189 (42.8 to 49.7%) after the IPO.

Collectively, there is an increase in the number of substantial individual and institutional shareholders after the IPO. An analytical study reports that retained ownership by insiders at the date of the IPO is positively related to company value (Downs and Heinkel, 1982; Ritter, 1984a).

4.3 Distribution of Substantial Shareholders After Lock-up Expiry From 2001 to 2011

Table 3 highlights the distribution of substantial shareholders after lock-up expiry from January 2001 to December 2011. On comparing Panels A and B, we can conclude that the number of existing individual shareholders that sold their shares (197; 56.1%) is more than the number of existing institutional shareholders that sold their shares (180; 48.0%). Moreover, the number of existing individual shareholders that bought new shares (153; 30.6%) is more than the number of existing institutional shareholders that bought new shares (125; 16.8%). In contrast, the number of new individual shareholders that came in as substantial shareholders (153; 30.6%) is less than the number of new institutional shareholders (169; 39.9%).

Table 3: Distribution of substantial shareholders after first lock-up expiry from 2001 to 2011 (from annual reports)

	Number	Percentage
Panel A		
Number of existing institutional shareholders that sold their shares	180	48.0
Number of existing institutional shareholders that bought new shares	125	16.8
Number of new institutional shareholders that came in as substantial shareholders	169	39.9
Panel B		
Number of existing individual shareholders that sold their shares	197	56.1
Number of existing individual shareholders that bought new shares	153	30.6
Number of new individual shareholders that came in as substantial shareholders	153	30.6

4.4 Empirical Results of Substantial Shareholders' Buy and Sell around Lock-up Expiry

In this section, we report the empirical results of substantial shareholders' buy and sell around lock-up expiry. In addition, we analyse the movement results of price, trading volume and bid–ask spread around lock-up expiry and discuss whether any abnormalities seen are because of insiders' trading or due to other factors.

The results show that there is no significant price movement at and around the lock-up expiry day for any category. In addition, the CAARs over the (–7, +7), (–20, +20) and (–2, +2) event windows mostly are different from zero for all categories (Table 4) except existing institutional investors that have bought new shares (Table 4), but the sale of institutional investors shows the most significant ARs at the 1% significance level.

The AVR is not significantly bigger than one on the first expiry day for most categories except existing individual shareholders that bought shares and individual shareholders that sold their shares. The MAVR over the (–20, +20), (–2, +2) and (–7, +7) windows around the first lock-up expiry is significantly greater than one for all categories (Table 5), which is an indication of significant sales by the substantial shareholders.

In contrast to Hypothesis 4, the AARs ratio does not improve significantly on the day before, the day after, or on the expiry day for all categories. The mean average abnormal returns (MAARs) of all categories increases significantly over the (–20, +20), (–2, +2) and (–7, +7) windows (Table 6).

Table 4: Abnormal returns of buy and sell of substantial shareholders (individual and institutional) before and after lock-up expiry

Days	N	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	(-7, +7)	(−2, +2)	(−20, +20)
								AAR_t (%)									CAARs		
Abnormal returns of existing institutional investors that bought new shares	125	0.00	−0.60	0.30	−0.70	−0.20	0.30	0.00	0.20	0.10	−0.00	−0.80	1.07	−0.10	−0.20	0.20	0.00	0.00	0.01
p-value		1.00	0.10	0.40	0.00	0.27	0.20	0.99	0.50	0.70	0.94	0.10	0.14	0.60	0.43	0.50	0.75	0.40	0.73
Abnormal returns of new institutional investors came in	169	−0.40	−0.00	−0.10	−0.10	0.04	−0.00	−0.45	−0.00	−0.30	−0.00	−0.10	−0.70	0.20	−0.08	−0.30	−0.03	−0.00	−0.13
p-value		0.20	0.80	0.60	0.50	0.93	0.70	0.05*	0.90	0.20	0.90	0.70	0.08*	0.50	0.76	0.39	0.02**	0.10	0.00***
Abnormal returns of existing individual bought	153	0.40	−1.00	−0.00	−0.30	0.31	0.40	−0.20	−0.00	−0.00	−0.10	−0.20	−0.70	−0.00	0.39	0.20	−0.01	0.00	−0.04
p-value		0.20	0.10	0.90	0.30	0.50	0.30	0.30	0.70	0.90	0.52	0.60	0.15	0.90	0.20	0.70	0.35	0.80	0.01**
Abnormal returns of new individual investors came in	153	1.00	−0.20	−0.30	0.10	0.34	0.10	0.93	−0.10	0.40	−0.00	−0.20	0.12	0.10	1.06	−0.10	1.05	−0.20	0.03
p-value		0.09*	0.50	0.50	0.70	0.42	0.60	0.15	0.60	0.20	0.70	0.40	0.83	0.70	0.12	0.74	0.03**	0.10	0.24
Abnormal returns of institutional investors that sold	180	−0.20	−0.50	−0.50	−0.50	−0.20	0.00	−0.12	−0.00	−0.60	−0.30	−0.00	−0.50	−0.10	0.35	−0.50	−0.04	−0.00	−0.13
p-value		0.30	0.01***	0.07*	0.07*	0.39	0.90	0.65	0.80	0.03**	0.14	0.80	0.09*	0.50	0.42	0.03**	0.00***	0.02**	0.00***
Abnormal returns of individual investors that sold	197	0.20	0.20	−0.10	−0.20	0.58	0.30	0.28	0.20	−0.20	0.20	0.50	−0.30	−0.10	0.89	−0.10	0.02	0.00	0.03
p-value		0.30	0.20	0.30	0.20	0.01**	0.20	0.32	0.40	0.40	0.30	0.10	0.15	0.50	0.01***	0.48	0.01***	0.30	0.02**

Notes: ***, ** and * indicate significance at the 1, 5 and 10% levels (two-tailed test), respectively.

Table 5: Abnormal volume of buy and sell of substantial shareholders (individual and institutional) before and after lock-up expiry

Days	N	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	(−20, +20)	(−2, +2)	(−7, +7)
Abnormal volume of existing institutional investors that bought new shares	125	14.00	3.20	2.80	2.80	4.80	3.00	3.50	2.20	2.70	3.00	2.20	1.80	12.70	2.60	1.10	3.20	2.80	4.20
Test Value = 1		0.16	0.22	0.10	0.09*	0.10	0.20	0.10	0.10	0.10	0.14	0.14	0.24	0.30	0.20	0.60	0.00***	0.00***	0.01***
Abnormal volume of new institutional investors that came in	169	8.12	8.15	2.00	2.00	2.00	5.00	1.10	2.30	2.30	2.05	15.00	3.53	5.74	12.00	8.60	6.10	2.50	5.40
Test Value = 1		0.25	0.22	0.10	0.20	0.10	0.20	0.50	0.10	0.10	0.17	0.28	0.25	0.28	0.10	0.20	0.00***	0.07**	0.00***
Abnormal volume of existing individual investors that bought	153	15.30	9.91	3.00	3.00	4.00	6.00	2.40	3.30	3.60	4.79	20.20	5.49	13.80	9.50	2.80	6.49	4.10	7.30
Test Value = 1		0.12	0.24	0.03**	0.10	0.05*	0.20	0.10	0.05*	0.07*	0.03**	0.25	0.13	0.11	0.10	0.04**	0.00***	0.01**	0.00***
Abnormal volume of new individual investors that came in	153	11.70	10.00	2.90	3.70	2.80	6.00	1.70	2.70	2.70	4.35	20.00	5.72	8.18	9.10	2.80	6.73	3.50	6.30
Test Value = 1		0.17	0.23	0.10	0.10	0.06*	0.20	0.06*	0.10	0.10	0.05**	0.26	0.11	0.21	0.10	0.04**	0.00***	0.02**	0.00***
Abnormal volume of institutional investors that sold	180	8.50	6.74	2.00	2.54	2.40	4.70	1.70	2.10	2.10	2.79	13.40	3.61	5.17	11.00	7.50	5.52	2.70	5.10
Test Value = 1		0.15	0.23	0.07*	0.10	0.06*	0.10	0.10	0.10	0.10	0.08*	0.24	0.15	0.24	0.10	0.20	0.00***	0.03**	0.00***
Abnormal volume of individual investors that sold	197	3.48	2.47	1.90	1.30	1.60	1.80	1.40	1.80	2.90	2.32	2.64	2.07	1.84	1.60	1.80	2.67	2.00	2.00
Test Value = 1		0.08*	0.02**	0.04**	0.20	0.20	0.10	0.39	0.06*	0.06*	0.11	0.07*	0.06*	0.04**	0.17	0.09*	0.00***	0.01**	0.00***

Notes: ***, ** and * indicate significance at the 1, 5 and 10 percent levels (two-tailed test), respectively.

Table 6: Abnormal bid–ask spread of buy and sell of substantial shareholders (individual and institutional) before and after lock-up expiry

Days	N	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	(−20, +20)	(−2, +2)	(−7, +7)
																	Abnormal spread		
Abnormal spread of existing institutional investors that bought new shares	125	2.15	2.25	1.81	1.84	1.71	1.84	1.79	1.77	1.64	1.53	1.23	1.01	1.11	1.06	0.90	1.31	1.71	1.58
Test Value = 1		0.39	0.38	0.42	0.38	0.43	0.27	0.36	0.38	0.35	0.31	0.43	0.97	0.54	0.71	0.57	0.00***	0.00***	0.00***
Abnormal spread of new institutional investors that came in	169	1.12	1.15	1.14	1.10	1.14	1.15	1.04	1.18	1.16	1.22	1.06	1.13	1.24	1.19	1.17	1.14	1.15	1.15
Test Value = 1		0.41	0.35	0.18	0.46	0.35	0.34	0.75	0.42	0.24	0.26	0.61	0.63	0.13	0.27	0.23	0.00***	0.01***	0.00***
Abnormal spread of existing individual investors that bought new shares	153	0.95	1.16	1.05	1.12	1.15	1.02	1.00	1.00	1.03	1.06	1.15	1.14	1.27	1.17	1.15	1.07	1.02	1.09
Test Value = 1		0.59	0.39	0.81	0.46	0.39	0.86	0.98	0.99	0.87	0.76	0.51	0.51	0.27	0.37	0.41	0.00***	0.15	0.00***
Abnormal spread of new individual investors that came in	153	1.16	1.16	1.06	1.02	1.15	1.18	1.07	1.16	1.15	1.12	1.08	1.12	1.09	1.17	1.07	1.11	1.14	1.12
Test Value = 1		0.15	0.33	0.63	0.91	0.36	0.32	0.64	0.53	0.37	0.46	0.62	0.40	0.53	0.37	0.58	0.00***	0.00***	0.00***
Abnormal spread of institutional investors that sold	180	1.37	1.46	1.37	1.19	1.25	1.23	1.18	1.26	1.29	1.28	1.24	1.18	1.20	1.16	1.05	1.19	1.25	1.25
Test Value = 1		0.27	0.15	0.16	0.38	0.30	0.22	0.39	0.31	0.12	0.15	0.15	0.25	0.27	0.27	0.72	0.00***	0.00***	0.00***
Abnormal spread of individual investors that sold	197	1.35	1.40	1.34	1.33	1.35	1.25	1.20	1.25	1.20	1.26	1.13	1.14	1.26	1.15	1.15	1.22	1.23	1.25
Test Value = 1		0.25	0.21	0.19	0.16	0.16	0.15	0.38	0.27	0.16	0.13	0.25	0.23	0.05*	0.20	0.24	0.00***	0.00***	0.00***

Notes: ***, ** and * indicate significance at the 1, 5 and 10% levels (two-tailed test), respectively.

5. Conclusion

This paper examines the effects of substantial shareholders' trading behaviour on share prices, trading volume and bid–ask spread around the lock-up expiry date for a sample of 379 Malaysian IPOs, during the period January 2001 to December 2011. In line with this objective, we find a number of existing individual and institutional shareholders that traded their shares around lock-up expiry and also a number of new individual and institutional shareholders that came in as substantial shareholders around lock-up expiry. In addition, we intend to find the distribution of companies with one, two, three and more than three substantial individual and institutional shareholders before and after the IPO and interpret their trading pattern.

Our analysis shows that the number of companies with substantial institutional and individual shareholders has increased after the IPO. This indicates that individual and substantial investors are optimistic about the future of the IPO companies and economics in general. A model by Leland and Pyle (1997) declares that the portion of shares kept by insiders at the IPO time can be accepted as a signal of quality.

Our findings show that the number of existing substantial individual and institutional shareholders that sold their shares was greater than the number of existing substantial individual and institutional shareholders that bought shares. That is the reason why we witness an abnormal trading volume and abnormal returns around the lock-up expiry date. The two other categories, 'New individual investors that came in as substantial shareholders' and 'New institutional investors that came in as substantial shareholders' show that some investors are still optimistic about the future of these IPO companies. The number of new individual shareholders that came in as substantial shareholders is less than the number of new institutional shareholders. In conclusion, the reason for a price drop could be increase in trading cost/bid–ask spread by market makers and also a downward sloping demand curve. Our analysis shows an increase in trading volume before the expiry, which is an indicator of illegal insider trading. Market makers, to protect themselves, would increase the spread, which results in a price drop. Significant CAARs show inconsistency about the EMH.

We assert that abnormal trading (extremely heavy or thin) following the expiry of the lock-up duration signals the amount of insider confidence regarding future prosperity. Apparently, trading volume signals the degree of insider confidence as they cannot sell shares prior to the expiry, but can buy unlimited shares. Heavy quantity exactly following the expiry may be understood and explained by investors as insider selling, and hence is a signal of a company of less quality. From another view, thin trading following the expiry date may signal insiders' confidence, and investors may explain this as good news.

The results are vital to provide input into the enforcement of laws and regulations to regulate insider trading and market manipulation. This is to strengthen the legal regimen to prevent the corrupt influences of insider trading and to provide a cure for insider trading. Insider trading and market manipulation are not beneficial and can have adverse effects on Bursa Malaysia.

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