

What is the “True” value of an initial public offering?

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Abstract: From the perspective of the behavioral finance, every investor is considered unique and thus homogeneity in opinion regarding the true value of an Initial Public Offering (IPO) is not possible. Miller (1977) suggests that the difference in opinion regarding the value of an IPO is high due to the lack of prior information on the IPO, and thus, every investor has a tendency to make a different estimate of the value of an IPO. In this study, first-day price spread is used as a proxy for the heterogeneity of opinion among investors regarding the true value of an IPO, using a sample of 93 Malaysian IPOs from January 2009 to December 2013. Using stepwise regression analysis, it is found that initial return, ratio first- day volume over total unit offered, and listing board can explain the level of price spread or heterogeneity of opinion regarding the “true” value of Malaysian IPOs.

Key words: Malaysian IPOs; Divergence of opinion; Hot and cold IPOs

1. Introduction

Research on investor behaviors in the aftermarket of Initial Public Offerings (IPOs) has attracted much attention with the resurgence of the behavioral finance in the late 1990's. From the perspective of behavioral finance, every investor is assumed to be unique and therefore it is not possible to have homogeneity of opinion among all investors regarding the value of an IPO. Investors are more likely to make different estimates of expected return from their investment that can affect their buy and sell decisions. Miller (1977) contends that divergence of opinions about an IPO exists when there is uncertainty about the future return distributions of the IPO due to the lack of information on the track record of the new firm. The divergence of opinion is greatest when the stock is first issued and this heterogeneous opinion narrows over time as more information is gathered about the firm. The divergence of opinion about an IPO is not easily observable but it can be inferred from investors' trading behaviors in the immediate aftermarket.

Some IPO pricing mechanisms, such as book-building and auction offering methods, provide potential investors with the opportunity to reveal a significant part of their private valuations of the new issue. Studies on IPO pricing mechanism show that book-building and auction offering methods provide incentives to investors to put forward bids that disclose their beliefs about the “true” value of an IPO. Examples of these studies are Benveniste and Spindt (1989), Biass et al. (2002), Chahine (2007), and Derrien and Womack (2003). Investors' beliefs are reflected in their offer prices. Chahine (2007) finds

divergence of opinion among investors is lower in a book-building method than in an auction method. However, in the case of a fixed-price IPO, such as that commonly practiced in Malaysia, the offer price is set prior to IPO allocation and as such, investors do not have the opportunity to place bids. Therefore, unlike the book-building and auction IPOs, with the fixed-price method, the offer price carries no information about investors' valuations of the IPO. Therefore it can be argued that fixed-price IPOs have higher divergence of opinions among investors compared to book-built and auction IPOs.

In Malaysia, since the most commonly used pricing mechanism is the fixed-price offering, the level of asymmetric information among IPO investors is perceived to be high. This means that heterogeneity of opinion regarding the prospect and the value of a firm are likely to be high among IPO investors in Malaysia. As proposed by Miller (1977), large divergence of opinion about a new issue will lead to short-run overvaluation. Given the importance of such behavioral implications, this paper seeks to examine factors that could potentially explain investor heterogeneous beliefs in a cross-sectional sample of 93 fixed-price Malaysian IPOs. In this paper, the proxy for investor heterogeneity is tied to variable that reflects investors' behavior in the IPO immediate aftermarket, namely first- day price spread, defined as the difference between the highest and the lowest stock price over the lowest price, in percent. The degree of price spread is a good indication of the extent to which investors disagree about the “true” value of an IPO.

As rightly pointed out in Miller's (1977) model, heterogeneous beliefs arise from the uncertainty regarding the future return distribution of an asset and such dispersion of beliefs can be due to several factors. Some of the possible factors that can have an

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impact on dispersion of beliefs regarding the true value of an IPO are: (1) speculative nature of IPOs (listing board as the proxy, where those IPOs listed on the ACE market of Bursa Malaysia are considered more risky (or more speculative in nature, and thus greater level of uncertainty) than those listed on the main market); (2) popular versus unpopular IPOs (hot versus cold IPOs as the proxy, where we would expect hot IPOs exhibit higher dispersion of beliefs); (3) levels of initial return (highly demanded IPOs is associated with high levels of initial return (see for example Yong and Isa (2003), and as such IPOs with high level of initial return should exhibit higher dispersion of beliefs regarding their true values); (4) trading volume (the higher the trading volume (during the first trading day), the higher is the investors' buying interest and therefore the higher the dispersion of beliefs); and (5) offer price (a low offer price would attract more potential buyers, and thus the lower the offer price, the higher the dispersion of beliefs due to wider spectrum of investors with heterogeneous belief regarding the IPO true value). These factors can also contribute to an investor's buying interest, where an investor will be more interested in speculative IPOs (as reported by Yong (2007), who noted that these IPOs have high over-subscription ratios), hot IPOs, highly underpriced IPOs (or IPOs with high initial returns), IPOs with high trading volumes, and IPOs with low offer prices.

During the period of this study, the Malaysian stock market, namely Bursa Malaysia, has two listing boards, namely Main Market and ACE Market. The characteristics of companies that seek listing on the ACE Market are very much different from those that seek listing on the Main Market. ACE Market was established with the objective of catering to the needs of technology and high-growth companies. IPOs listed on the ACE Market are characterized by companies that are small in size, lack of information on track record and have difficulty securing conventional sources of financing as compared to those companies listed on the Main Market. In general, companies listed on the Main Market are large, mature and stable. Firms listed on the ACE Market are harder to value and thus subject to greater valuation uncertainty compared to those listed on the Main Market. It can be argued that investor beliefs should be more diverse for assets that are difficult to value. This means that, harder to value IPOs will lead to greater divergence of opinions among investors regarding their true values. Based on this line of argument, it can be hypothesized that IPOs listed on the ACE Market will exhibit higher level of price spread compared to those listed on the Main Market.

The remainder of this paper is organized as follows. Following the introduction section, Section 2 reviews some relevant past studies and Section 3 describes the methodology. Section 4 presents the results, whilst Section 5 concludes the paper.

2. Literature review

From the viewpoint of behavioral finance, as pointed out by Goldberg and Nitzsch (2001), asset price and its movement mirror the behavior of market participants which is a reflection of investor's interpretation of information obtained and opinions formed following such interpretation. This means that, in the context of an IPO issue, investor's information or knowledge of an IPO will affect the way investor behaves, and variations in investor's opinions or expectations will therefore affect the performance of the IPO. While investors' opinions on the prospect of firms are usually not easily observable, these opinions can be inferred from investors' behaviors in the IPO aftermarket. Differences in investors' expectations are likely to affect their willingness to buy and sell the IPO. Investors' decisions are reflected in their trading activity (as shown by the first-day trading volume) and in the range of trading prices (as shown by the first-day price spread) that they are willing to pay in the IPO aftermarket. This in turn will affect the performance of the IPO shares in the short-run.

Some past studies suggest that IPOs that are characterized by greater level of uncertainty tend to be more underpriced (Baron, 1982; Beatty and Ritter, 1986; Houge et al., 2001; Lowry and Schwert, 2002; Megginson and Weiss, 1991; Miller, 1977; Miller and Reilly, 1987; Ritter, 1984; Rock, 1986). Furthermore, uncertainty can generate disagreement among investors regarding the "true" value of an IPO; in turn the disagreement can lead to high trading volume. It can be argued that high level of price spread during the first-day of IPO trading is related to high trading volume on that day.

Bayley et al. (2006) suggest that IPO underpricing can generate certain behavioral tendencies that affect the trading decisions of investors in the IPO aftermarket. They find that underpricing plays an important role in influencing the decision of IPO investor to sell their initial allocation of share in the immediate aftermarket, that is, the higher the level of underpricing the higher is the likelihood investors will sell their initial allocation of shares.

Krigman et al. (1999) examine the immediate aftermarket behavior of block traders and find that large IPOs with low level of underpricing are associated with high level of first-day selling of block shares. They also find that the selling of block allocation of shares occurs more often in hot IPOs as compared to cold IPOs, and extra-hot IPOs (defined as those with first-day return greater than 60 percent) have the heaviest trading activity. In addition, Aggarwal (2003) finds that investor's tendency to flip shares varies with the degree of underpricing; hot IPOs are flipped much more than cold IPOs.

The theoretical model of Karpoff (1986) suggests that trading volume is a good proxy for divergence of opinion among investors. Other studies that provide support to the argument that differences in opinions motivate trading activity are, among others, Harris and Raviv (1993), Hong and Stein (2003), and Scheinkman and Xiong (2002). Furthermore,

Chahine (2007) argues that highly underpriced issues tend to attract greater diversity of informed investors and thus generates huge trading volume in the aftermarket. This means that first-day high trading volume reflects investors' revision regarding the IPO value.

Studies cited earlier, in general, suggest that the level of IPO underpricing is an important determinant of investor early aftermarket behavior. It is also a good indication of the extent of heterogeneous beliefs among investors. As pointed out by Lowry and Schwert (2002), the level of underpricing in an IPO can be attributed to some IPO-specific information known prior to the offering as well as some new information that is available in the secondary market when the IPO starts trading. In other words, the variable IPO initial return captures both the ex-ante and ex-post information available to the investors. Since prospective IPO investors have no opportunity to reveal their beliefs in offerings that employ fixed-price mechanism, heterogeneity of opinions among IPO investors can be argued to be higher in fixed-price IPOs compared to book-built or auctioned IPOs. In Malaysia, given that most IPOs are priced using the fixed-price mechanism, heterogeneity of opinions among investors are likely to be high. For the reason that heterogeneity of opinions has important behavioral implications, in this paper, factors that could potentially explain the level of heterogeneous opinions among IPO investors in Malaysia are explored. First-day price spread is used to proxy for investor heterogeneous beliefs and since these opinions are not directly observable, the proxy is specifically tied to variables that reflect investors' behaviors in the IPO immediate aftermarket. Multiple regression analysis is employed in this study, where in the regression model the dependent variable is the price spread, and the independent variables are those factors that might have an impact on the price spread as discussed earlier. As generally known, multiple regression analysis is a statistical technique that can be used to analyze the relationship between a single variable and several independent (or predictor) variables (Hair et al., 2010, page 161). In this study, I employ the "stepwise" regression analysis because with stepwise regression method, we can develop a regression model with the fewest number of statistically significant independent variables and at the same time having a maximum predictive accuracy (Hair et al., 2010, page 219). In a way, a stepwise regression analysis will help a researcher to determine the "most appropriate" model based on the "potential" independent variables available.

3. Methodology

The sample employed in this study comprised of 93 fixed-price IPOs listed on Bursa Malaysia (Malaysia Stock Exchange) from January 2009 through December 2013. The sample period begins in January 2009 in order to avoid including IPOs listed during the global sub-prime financial crisis of

2008. During the period of this study there are two listing boards of Bursa Malaysia, namely the Main Market and the ACE Market. Main Market list stocks of big and stable companies, whereas the ACE Market caters for stocks of small and technology companies. In a fixed-price offer, the price has been set prior to the allocation. If there is excess demand, shares are rationed on a pro rata or lottery basis. In this study IPOs that use book building, which is very popular in the US, are excluded. During the period of this study, the number of book-built IPOs is less than 5.

In general, the information used in this study is compiled from Bursa Malaysia website (<http://www.bursamalaysia.com>), KLSE Info website (<http://www.klse.info/counters/historical-prices/>) and the Star Online website (<http://biz.thestar.com.my/marketwatch/ipo>). Both the Star Online and the KLSE Info websites provide data on opening price, closing price, maximum price, minimum price and volume of trading during the first day of trading.

Initial return refers to the percentage change in price from the offer price to the opening price of the first day's trading. In cases where the offer price for retail investors is different from the offer price for institutional investors, the offer price for retail investor is used because it reflects the public allocation rather than non-public (i.e. institutional) allocation. In this study, price spread refers to the difference between the maximum price and the minimum price of the first day's trading, divided by the minimum, in percent.

I provide descriptive statistics for the full sample and for the two subsamples of IPOs categorized as cold and hot issues, based on initial returns or the level of IPO underpricing. I also present the descriptive statistics for IPOs listed on the Main Market as well as those listed on the ACE Market. This means that, for comparison purposes, I split the full sample of 93 IPOs into two groups, the cold and hot issues, based on the cut-off point of 7.14 percent (median initial return of 7.14% is used as the cut-off point between the two groups), and also based on the listing board, the Main Market and ACE Market.

In the cross-sectional analyses I first model investor heterogeneity as a function of ratio of first-day volume over total unit offered, offer price, hot versus cold IPOs and listing board. Next, I also model investor heterogeneity as a function of ratio of first-day volume over total unit offered, listing board, initial return and natural log of offer price. This is done in order to improve the R^2 of the model formed. Specifically, offer price is transformed into natural log of offer price, and initial return replaces hot and cold IPOs. In addition, I employ stepwise method of regression analysis. Unlike the "enter" regression model (usually referred to in finance literature as the OLS regression model) where all "potential" factors (or independent variables) are "entered" (or included) into the model, and the t -statistic (indicates significance of each factor to the model) is given, regardless of whether or not the factor is

significant, with “stepwise” regression analysis, only significant variables will be retained in the model. Unlike “enter” regression method where a researcher will have to decide on the independent variables to be retained (usually based on the significant contribution of each independent variable to the overall model), the stepwise regression method is designed to develop a regression model with the fewest number of statistically significant independent variables and maximum predictive accuracy (Hair et al., 2010). Furthermore, with stepwise regression method, problems usually encountered in OLS regression method (such as multi-collinearity, and the “adequate” number of significant variables chosen for inclusion in the model) will be eliminated.

Investor heterogeneity refers to the divergence of opinions among IPO investors. I use first-day price spread as the proxy for heterogeneity in investor beliefs. I define first-day price spread as the difference between the highest and lowest stock price on the first day as a fraction of the lowest price, in percent. The two regression models are specified as follows:

$$(1) \text{ FIRST-DAY PRICE-SPREAD} = b_0 + b_1 \text{ RATIO OF FIRST - DAY VOLUME OVER TOTAL UNIT OFFERED} + b_2 \text{ OFFER PRICE} + b_3 \text{ HOT VERSUS COLD IPOs} + b_4 \text{ LISTING BOARD} + e$$

$$(2) \text{ FIRST-DAY PRICE SPREAD} = b_0 + b_1 \text{ RATIO OF FIRST-DAY VOLUME OVER TOTAL UNIT OFFERED} + b_2 \text{ LISTING BOARD} + b_3 \text{ INITIAL RETURN} + b_4 \text{ LN OFFER PRICE} + e$$

where FIRST-DAY PRICE-SPREAD is defined as the difference between the highest price and the lowest price during the first-day of trading divided by the lowest price, in percent; RATIO OF FIRST-DAY VOLUME OVER TOTAL UNIT OFFERED is defined as the total trading volume during the first-day of trading divided by the total number of shares floated by the IPO firm; OFFER PRICE is the price offered to the investors by the firm that issues the IPO; HOT VERSUS COLD IPOs is dummy variable equals 1 for hot IPOs and 0 for cold IPOs; INITIAL RETURN is defined as the change in price from the offer price to the opening price on the first trading day divided by the offer price; LN OFFER PRICE is the natural logarithm of the offer price; LISTING BOARD is dummy variable equals to 1 for IPOs listed on ACE Market and zero for IPOs listed on the Main Market; and e is the residual term. The inclusion of the listing board dummy in the regression model aims to capture the dispersion of investor beliefs that might be related to the distinctive characteristics of the ACE companies.

Based on the argument that IPOs characterized by greater uncertainty tend to be more underpriced and according to Chahine (2007) that, highly underpriced issues tend to attract a larger pool of differentially informed investors, it can be inferred that initial return represents an important variable

in determining the level of divergence in opinions. It can be hypothesized that an IPO characterized by high level of uncertainty and associated with a large diversity of informed investors are likely to generate high level of investor disagreement due to dispersion of beliefs among investors. The IPO offer price aims to capture the differences in investor opinions that may be related to the price of the offering. It can be argued that a lowly priced IPO is more likely to be subject to speculative activity and thus ex-ante uncertainty is expected to be greater for lower priced IPOs compared to higher priced IPOs.

High first-day trading volume may just be a reflection of the buying interest that comes from investors who did not receive the IPO allocation but eager to buy the shares in the aftermarket or of those successful investors who wish to increase their stock holdings. The buying interest can be attributed to many factors, but it can be argued that the resulting high trading volume can have direct influence on the first-day price spread.

In this study, listing board is used as a proxy for firm size, where IPOs that are listed on the ACE Market are considered to be small-sized speculative firms, and those that are listed on the Main Market are large-sized quality firms. It is interesting to find out whether listing board (or size of firms) plays an important role in explaining the level of price spread of Malaysian IPOs. If the relationship exists, it can be used by investors as a guide in their investment endeavor, either to avoid small-sized firms due to their high price spread (i.e. uncertainty) or to keep them for speculative purposes. In order to test the existence of size effect in Malaysian IPOs, I employ the independent t-test on the equality of means (average initial returns), between the two boards of listing.

4. Results

Table 1 presents a summary of the characteristics of the 93 IPOs used in this study, for the period between January 2009 and December 2013. In Panel A, I present the descriptive statistics of initial return, first-day price spread, number of shares issued, offer price and offer size for hot IPOs, and the descriptive statistics for cold IPOs are presented in Panel B. In Panel C and Panel D, I present the descriptive statistics for ACE Market and Main Market, respectively. The descriptive statistics for the overall 93 IPOs are presented in Panel E. Initial return reported refers to percentage change from offer price to opening price during the first day of trading, or usually referred to as initial return (offer-to-open).

For the full sample of 93 fixed-price IPOs, the average number of shares issued is 344 million shares and a median value of 80.40 million shares, with a maximum value of 5.274 billion shares and a minimum value of 15.32 million shares. The average offer price is RM1.04, a median offer price of RM0.75, a maximum offer price of RM5.05 and a minimum offer price of RM0.12. The average offer size is

RM642.41 million, with a median of RM44.35 million, a maximum value of RM12.5 billion and a minimum value of RM8.1 million.

Table 1: Descriptive statistics

	Mean	Median	Std. Dev.	Min.	Max.
Panel A: Hot IPOs (n=46)[@]		18.05	49.47	7.72	288.89
Initial return (%)	35.93				
Price spread (%)	25.83	15.21	30.21	4.20	165.06
Shares issued (mil.)	310.00	79.35	751.50	15.93	4120.16
Offer price (RM)	1.06	0.64	1.16	0.12	5.05
Offer size (RM mil.)	911.37	32.30	2848.10	8.10	12500.00
Panel B: Cold IPOs (n=45)[@]		1.00	12.48	-66.84	5.83
Initial return (%)	-3.42				
Price spread (%)	14.55	10.91	13.74	1.03	83.00
Shares issued (mil.)	374.00	87.90	880.40	15.32	5273.65
Offer price (RM)	0.98	0.85	0.66	0.12	3.50
Offer size (RM mil.)	342.79	60.22	770.49	11.82	4550.00
Panel C: ACE Market (n=23)		20.00	67.40	-24.21	288.89
Initial return (%)	43.23				
Price spread (%)	40.91	28.95	37.71	8.16	165.06
Shares issued (mil.)	68.62	67.65	35.20	15.93	145.00
Offer price (RM)	0.41	0.33	0.24	0.12	1.08
Offer (RM mil.)	22.42	22.54	8.58	8.10	37.44
Panel D: Main Market (n=70)		4.95	2.95	-66.84	121.43
Initial return (%)	7.41				
Price spread (%)	13.21	10.52	10.71	1.03	68.42
Shares issued (mil.)	434.00	95.74	913.60	15.32	5273.65
Offer price (RM)	1.25	0.89	0.97	0.12	5.05
Offer size (RM mil.)	846.12	82.52	2377.70	10.42	12500.00
Panel E: Overall (n=93)		7.14	40.70	-66.84	288.89
Initial return (%)	16.27				
Price spread (%)	20.06	13.73	23.88	1.03	165.06
Shares issued (mil.)	344.00	80.40	807.20	15.32	5273.65
Offer price (RM)	1.04	0.75	0.93	0.12	5.05
Offer size (RM mil.)	642.41	44.35	2089.92	8.10	12500.00

The mean initial return (offer- to- open) for hot IPOs is 35.93 percent as opposed to -3.42 percent for cold IPOs. The mean initial return for IPOs listed on the ACE Market is 43.23 percent as opposed to only 7.41 percent for IPOs listed on the Main Market. For the overall 93 IPOs, the mean initial return is 16.27 percent, with a median of 7.14 percent, and a maximum value of 288.89 percent and a minimum value of -66.84 percent. For comparison, Yong and Isa (2003) report a mean initial return (offer-to-open) of 94.91 percent for 468 Malaysian IPOs for the period 1990-1998, and Yong (2007) reports a mean initial return (offer-to-open) of 38.08 percent for 185 Malaysian IPOs for the period 1999-2003. A more recent study by Low and Yong (2013) report an average initial return (they calculate initial return as the percentage change from offer price to closing price on the first trading day, or initial return (offer-to-close)) of 26.54 percent for 219 Malaysian IPOs from January 2004 to December 2007, with an average initial return of - 6.78 percent and 52.55 percent for cold IPOs and hot IPOs, respectively.

The average first-day price spread for hot IPOs is 25.83 percent as opposed to the average spread of 14.55 percent for the cold IPOs. The average price

spread for IPOs listed on the ACE Market is 40.91 percent, as opposed to the average of only 13.21 percent for the IPOs listed on the Main Market. For comparison, Low and Yong (2013) report an average first-day price spread of 14.82 percent for cold IPOs and 32.30 percent for hot IPOs. They define first-day price spread as the difference between the highest and lowest stock price on the first trading day, divided by the IPO offer price, in percent.

As shown by the *t*-statistic of -5.177 and the corresponding *p*-value of 0.000 presented in Panel A of Table 2, the mean initial return of cold IPOs is significantly lower than that of the hot IPOs. For comparison, Low and Yong (2013) report a *t*-statistic of -11.86 (significant at 1 percent level). Similarly, as shown by the *t*-statistic of -3.94 and the corresponding *p*-value of 0.000 presented in Panel B, the mean initial return of IPOs listed on the Main Market is significantly lower than that of the IPOs listed on the ACE Market. The result shows an indication of the existence of size effect, where small-sized firms (IPOs listed on the ACE Market as the proxy) perform better than big -sized firms (Main Market IPOs as the proxy).

In terms of price spread, as shown by the *t*-statistic of -2.302 and the corresponding *p*-value of 0.025 presented in Panel A of Table 2, the mean spread of cold IPOs is significantly lower than that of the hot IPOs, at the 5 percent level of significance. For comparison, Low and Yong (2013) report a *t*-statistic of -4.72 (significant at 1 percent level). In the case of price spread based on listing board as

shown in Panel B of Table 2, *t*-statistic of - 5.552 and the corresponding *p*-value of 0.000 clearly indicate that the average price spread of Main Market IPOs is significantly lower than the of the IPOs listed on the ACE Market. The results indicate that the level of investor heterogeneity differs across the cold and hot IPOs, and also across listing board.

Table 2: Results of the independent *t*-test

	n	Mean (%) of	
		Initial return	Price spread
<i>Panel A: Cold versus Hot IPOs</i>			
Cold IPOs	45	-3.43	14.55
Hot IPOs	46	35.93	25.50
		<i>t</i> -stat. = -2.302 (<i>p</i> -value = 0.025)	<i>t</i> -stat. = -5.552 (<i>p</i> -value = 0.000)
<i>Panel B: Main Market versus ACE Market</i>			
Main Market	70	7.41	13.21
ACE Market	23	43.23	40.91
Result of the <i>t</i> -test		<i>t</i> -stat. = -3.94 (<i>p</i> -value = 0.000)	<i>t</i> -stat. = -5.552 (<i>p</i> -value = 0.000)

Table 3 reports the results of cross-sectional regressions for the entire sample of 93 IPOs. The dependent variable is the first-day price spread, and the independent variables are ratio of first-day volume over total unit offered, offer price, hot versus cold IPOs and listing board. Of those four independent variables, only two variables, namely listing board (*t*-statistic of 4.820, with the corresponding *p*-value of 0.000) and ratio of first-day volume over total unit offered (*t*-statistic of 3.862, with the corresponding *p*-value of 0.000) are

significant in explaining the first-day price spread. The adjusted R² is 0.345, and a Durbin-Watson statistic of 2.173. The value of the Durbin-Watson statistic indicates that there is no auto-correlation in the residuals. The model formed is as follows:

$$\text{FIRST -DAY PRICE-SPREAD} = 5.519 + 23.310 \text{ LISTING BOARD} + 13.371 \text{ RATIO OF FIRST-DAY VOLUME OVER TOTAL UNIT OFFERED.}$$

Table 3: Cross-sectional regression (stepwise method) results

	p-value	t-statistic	Coefficient	Variable
	0.079	1.780***	5.519	Constant
	0.000	*	23.310	Listing board
		4.820		
	0.000	***		Ratio of first-day volume over
		3.862	13.371	total unit offered
	@	(<i>p</i> -value=0.000);	F-value=24.732 ₂	
Adjusted R = 0.345 ; Durbin-Watson D= 2.173				
First-day spread is the dependent variable, and it is calculated as [(maximum price – minimum price)/(minimum price)] x 100%, which is the percentage change from minimum to maximum price.				
The value of the Durbin-Watson statistic indicates that there is no auto-correlation in the residuals				
Significant at the 10 percent level				
Significant at the 5 percent level				

In Table 4, I report the results of the regression analysis (stepwise methods) with price spread as the dependent variables, and substituting offer price with natural log of offer price, and replacing hot versus cold IPOs with initial return. The substitution has improved from the earlier adjusted R² of 0.345 as shown in Table 3, to the much improved adjusted R² of 0.634. The independent variable initial return has contributed significantly to the new model, as shown by the *t*-statistic of 8.492 and the corresponding *p*-value of 0.000. The newly model formed consists of initial return (*t*-statistic of 8.492 and the corresponding *p*-value of 0.000), ratio of first-day

volume over total unit offered (*t*-statistic of 4.168 and the corresponding *p*-value of 0.000), and listing board as the independent variables (*t*-statistic of 3.195 and the corresponding *p*-value of 0.002), with an adjusted R² of 0.634 and a Durbin-Watson statistic of 2.014. The Durbin-Watson statistic indicates that there is no auto-correlation in the residuals. The new model formed is as follows:

$$\text{FIRST -DAY PRICE SPREAD} = 4.460 + 0.342 \text{ INITIAL RETURN} + 10.505 \text{ RATIO OF FIRST-DAY VOLUME OVER TOTAL UNIT OFFERED} + 12.164 \text{ LISTING BOARD.}$$

Table 4: the model formed is done in order to see whether can be improved in terms of its R: Results of cross-sectional regression (stepwise method) with natural log of offer price replacing offer price, and initial return replacing hot versus cold IPOs

p-value	t-statistic	Coefficient	Variable
0.053	*	4.460	Constant
	1.957***		
0.000	8.492	0.342	Initial return
	***		Ratio of first-day volume over
0.000	4.168***	10.505	total unit offered
0.002	3.195	12.164	Listing board
@	(p-value=0.000);	F-value=54.17 8 ₂	
Adjusted R =0.634; Durbin-Watson D= 2.014			
<i>Notes:</i>			
First-day spread is the dependent variable, and it is calculated as [(maximum price – minimum price)/ (minimum price)] x 100%, which is the percentage change from minimum to maximum price.			
The value of the Durbin-Watson statistic indicates that there is no auto-correlation in the residuals			
Significant at the 10 percent level			
Significant at the 5 percent level			
Significant at the 1 percent level			
the Model With the new independent variables			

For comparison, Low and Yong (2013) report a model of price spread (defined as the difference between highest and lowest price on first trading day, divided by offer price, in percent) as the dependent variable, and independent variables consisting of initial return, natural log of offer size, over-subscription ratio, and listing board, with an adjusted R² of only 0.483. In Low and Yong (2013), the sample is from January 2004 to December 2007, i.e. the period before the 2008 sub-prime crisis. They define initial return as the percentage change from offer price to closing price or usually known as initial return (offer- to- close). During their study period from 2004 to 2007, listing board of Bursa Malaysia consists of Main Board, Second Board and MESDAQ; however, they somehow combine the Main Board and the Second Board as a group and consider MESDAQ as another group. They use over-subscription ratio as one of the independent variables, but in the current study I employ only initial return and exclude over- subscription ratio due to very significant correlation between these two independent variables (i.e. multi-collinearity problem), as indicated by Yong and Isa (2003), Yong (2007), and also by Low and Yong (2013) themselves. In a way, the newly formed model is an improvement from the earlier model proposed by Low and Yong (2013), at least in terms of the adjusted R², from 0.483 in the old model to 0.634 in the newly proposed model.

The coefficients of initial return and listing board are positive and highly significant. That is, highly underpriced IPOs and issues listed on the ACE Market have larger first-day price spread. The

results suggest that IPOs with high level of underpricing and listed on the ACE Market are associated with greater dispersion of investor beliefs as reflected by the wide price spread on the first trading day. Ratio of first- day volume over total unit offered is also a significant independent variable that can explain the level of price spread. The positive coefficient value of this variable indicates that trading volume is positively related to the level of price spread. As pointed out by Harris and Raviv (1993), heterogeneous beliefs among investors can create significant aftermarket trading volume. Although investors' opinions are not observable, it can be inferred from their trading activity during the first- day of trading which later being reflected in the level of price spread on that day; the higher level of trading volume is indicative of higher level of heterogeneous beliefs among investors regarding the true value of an IPO.

5. Conclusion

This paper examines the heterogeneity of opinion among investors regarding the "true" value of an IPO, measured as the first-day price spread of Malaysian IPOs. The sample used in this study comprises of 93 fixed-price IPOs listed on the Main Market and the ACE Market of Bursa Malaysia. The study period is from January 2009 to December 2013, a period after the 2008 global sub-prime crisis. In general, the average initial return of IPOs listed on the ACE market (proxy for small-sized firms) is significantly higher than the average of those IPOs listed on the Main Market (proxy for big- sized firms), an indication that "size effect" plays an important role in explaining the under- pricing phenomenon in Malaysian IPOs. Similarly, the average price spread of IPOs listed on the ACE Market is significantly higher than those IPOs listed on the Main Market. The average price spread of hot IPOs is also significantly higher than that of the cold IPOs, even-though not as highly significant as in the case of listing board. This study also examines factors that could potentially explain investor heterogeneous belief in a fixed- price method of the IPO pricing mechanism. Unlike book- building and auction-like methods, in fixed-price offering, investors have little opportunity to disclose their opinions, and as such the only way for investors to reveal their beliefs is when the IPOs start trading. Investor beliefs are not observable but these beliefs can be inferred from investor trading activity during the first day of IPO trading. I employ first-day price spread as the proxy for investor heterogeneity. In the model formed, the independent variables consist of initial return, ratio of first-day volume over total unit offered, and listing board. The findings of this study have some policy implications to the regulatory bodies of Bursa Malaysia where special attention should be given to the IPOs that have high initial return and high first-day trading volume, and IPOs that are listed on the ACE Market. The IPOs with these characteristics are subject to speculation due to their speculative nature

and the very high divergence of opinion regarding their true values among the investors.

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