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IPO INITIAL RETURNS AND VOLATILITY: A STUDY IN AN EMERGING MARKET

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ABSTRACT

This study examines the impact of firm characteristics, signaling variables and financial variables on IPO initial returns and the volatility of initial returns. Hierarchical regression is first performed on all the three blocks of variables, after which a stepwise regression is executed to further test on the significance of the relationship amongst the respective individual variables. The results designate differences in the relationship between firm characteristics, signaling variables and financial variables on IPO initial returns and the volatility of initial returns. It is conjectured that oversubscription of IPOs have a positive impact on the initial returns, whilst prospective dividend yield has a negative impact on the volatility of IPOs' initial returns.

JEL: G1, G12, G14, G120

KEYWORDS: IPO, Initial Returns, Volatility of Initial Returns

INTRODUCTION

G oing public is an important breakthrough in the maturation of a company and a good indulgent of IPOs by all participants may well offer a momentous support to the progress of the equity funding. Early studies on IPOs have mainly concentrated on the empirical evidence in the initial returns of new issues (Reilly and Hatfield, 1969; Stoll and Curley, 1970; McDonald and Fisher, 1972; Logue, 1973; Reilly, 1973; Nueberger, 2005; Hammond, 1974; Ibbotson, 1975; Ibbotson and Jaffe, 1975; Reilly, 1977 and Derrien, 2005) but later studies looked into the causes of initial returns etc. There is still a great absence in examining the volatility of IPOs' initial returns, except for some work undertaken by Lowry et al. (2010). This warrants further in depth research on the presence and causes to these fluctuations in the IPOs' initial returns and this study intends to bridge the gap.

Ambiguity surrounding the IPO atmosphere has constantly generated great interest among academicians over the eras due to the high initial returns. Initial return in this context is defined as the difference between the IPO's offer price and the closing market price on the first day of trading in the secondary market (Ibbotson, Sindelar, & Ritter, 1988; Ritter, 1998). A positive initial return is known as underpricing, whilst a negative initial return is known as overpricing. In the Malaysian front, Prasad, Vozikis and Ariff (2006) showed that the average market-adjusted initial returns on the first day of listing were 57% during the pre-policy period, in contrast with 118% during the post-policy period. Similarly, for the first week of listing was 59% in the pre-policy period, and 111% in the post-policy period, and finally, on the first month of trading were 60% in the pre-policy period against 109% in the post-policy period. Ariff, Prasad & Vozikis (2007) examined the degree of underpricing of initial public offerings (IPOs) of government linked companies (GLCs) and found the average market-adjusted initial returns in Malaysia for the first day of trading was 133.5%, whilst the first month's initial returns was 112%. As in Singapore, the first day's initial return was 41.71% on the first day but the first month's initial return was only 38.4%. These statistics clearly indicate that initial returns of IPOs differ among countries and over different periods.

This study will attempt to examine the impact of firm characteristics (firm size, firm age and industry), signaling variables (ownership retention, auditors' reputation, underwriters' reputation and over-subscription rate) and financial variables (prospective earnings per share and prospective dividend yield) on both the initial returns and the volatility of IPOs' initial returns.

The rest of the article proceeds as follows: The next section reviews the extant literature on initial public offerings and development of the hypotheses. This is followed by a description of the methodology used in this study. Lastly, a discussion on the analysis and the conclusion will be presented.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

At the root of an IPO's initial return is the asymmetric information theory (Leland and Pyle's, 1977; Baron, 1982; Rock, 1986; Beatty & Ritter, 1986; Loughran and Ritter, 2002; Ritter & Welch, 2002). Studies on asymmetric information and its impact on initial returns are imperative because when a company goes public, uncertainty arrives due to asymmetric information between all stakeholders, i.e., the issuers, investors and the investment banks (underwriters).

One of the strands of asymmetric information is signaling hypothesis, which advocates that certain characteristics in a company is able to send signals to potential investors on the credibility of the company. In that context, research documents that retained equity by the owners signal to investors on the credibility and the expected future prospects of the company. This gives a further boost to the investors, with higher levels of retained equity signaling greater confidence in the firm's future prospects and this may help in mitigating the asymmetric information problems between the issuers and the potential investors. Subsequently, this could also assist underwriters' in pricing the IPOs more accurately. The signaling theory predicts a negative relationship between the two variables because higher ownership retention reduces asymmetric information between issuers and investors, thus enabling underwriters to place a value close to the intrinsic value of the firm, ceteris paribus.

Leland and Pyle's (1977) pioneered the study on ownership retention and its impact on firm value. They found a positive relationship between the two variables. Downes and Heinkel (1982) undertook an empirical examination of the role of signaling in the valuation of initial public offerings of common stock and also found that the signaling hypothesis holds i.e., ownership retention sends a signal to investors on the value of the firm, thus reducing information asymmetry between issuers and investors. Ritter (1984) researched further on the above two studies and found that ownership retention does send a signal to investors on the value of the firm going public. Grinblatt and Hwang (1989) added to this body of literature by saying that the issuers signal higher quality in IPOs by underpricing as well as retaining some of the firms' shares in their personal portfolio.

Auditors' reputation has also been documented to signal firm quality, which will ease uncertainty surrounding IPOs and bridge the asymmetric information gap. DeAngelo (1981) and Shapiro (1983) demonstrated that larger and more prestigious auditors are more reliable in providing quality service. In line to that, Titman and Trueman's (1986) and Simunic and Stein's (1987) model implied that reputable auditors reduce the riskiness of new issues. Beatty (1989a) obtained similar results and found a negative association between auditors' reputation and underpricing. Feltham, Hughes, & Simunic, (1991) found that auditors affect the quality of information provided, thus reducing uncertainty amongst investors and this was further supported by Michaely and Shaw's (1995), whose results found that auditors' prestige and underpricing are inversely related. Empirical evidence by Wang and Wilkins (2007) showed that IPOs audited by the big-6 firms (then) experienced significantly less underpricing than IPOs audited by the non-big 6. Similarly, Albring, Elder and Zhou (2007) suggested that the selection of auditors' is essential as the

reputation of the auditors' may have an effect on the offered share prices. This is also concurred by Wang and Wilkins (2007), whose research revealed that IPOs that are audited by the Big-6 audit firms faced less underpricing compared to IPOs that are audited by the non-big-6. Interestingly, research conducted by Chang (2008) in Australia on 361 companies from the year 1996 to 2003 revealed no empirical proof that the quality of audit mitigated the ex-ante uncertainty and in turn lower underpricing.

Similar to the reputational effects of auditors' reputation, underwriters (investment banks) also have a signaling effect on firm quality. Many researches document a negative relationship between underwriters' reputation and underpricing. Logue (1973) and Beatty and Ritter (1986) are amongst the first to develop a measure of underwriter reputation, followed by Carter and Manaster (1990), Johnson and Miller (1988), Megginson and Weiss (1991) and Johnson and Weiss (1991). The authors found a negative association between reputable underwriters and short-run underpricing. Gordon and Jin (1993) asserted that underwriters reduce information asymmetry, hence govern a mutually beneficial offering price to both the parties. Thus, prestigious underwriters reduce uncertainty in an IPO environment, consequently enhancing the IPO firm's performance (Carter, Dark, & Singh, 1998; Carter & Manaster, 1990; Megginson & Weiss, 1991). Carter and Manaster (1990) found prestigious underwriters to be associated with low risk firms and their IPOs have low initial returns. Rock (1986) followed by Beatty and Ritter (1986) argued that IPO underpricing compensates uninformed investors for the risk of trading against superior information. Similarly, Michaely and Shaw (1994) found that IPOs managed by prestigious investment bankers tend to have smaller initial returns. Kenourgios et al. (2007) claimed that underwriters with a high reputation lower the possibility of under-pricing and long-term under-performance in their study of IPOs at the Stock Exchange of Athens. Contrasting to the above findings, Yip et al., (2009) documented that short-term excess returns and the following long-term under-performance are highly anticipated when companies are underwritten by reputable underwriters. Quite surprisingly, it was discovered by Goergen et al., (2007) that in U.K, there was no association between investment banks' reputation and the performance of IPOs. Chaturvedi et al. (2005) attempted to identify the relationship between market index, number of shares, deal size, growth rate, number of lead managers, retention and over-subscription against initial returns for Indian IPOs. His study conjectured that under-pricing is affected significantly by the over-subscription of IPOs.

In addition to auditors'/underwriters' reputation, firm characteristics also have an impact on the IPOs' initial returns and its volatility. Extant literature has documented firm size as having an impact on IPOs' initial returns and its volatility as investors perceive larger firms as companies with lower level of uncertainties. Larger firms generally have easier access to fundamental resources such as financial and human capital, which are vital in ensuring the future performance of these firms, (Finkle, 1998). Consistent with this, several studies have found a negative association between firm size and IPO underpricing (e.g., Carter, Dark, & Singh, 1998; Ibbotson, Sindelar, & Ritter, 1988; Ibbotson, Sindelar, & Ritter, 1994; Megginson & Weiss, 1991) Another factor affecting the correlation between firm size and IPO firm performance is the fact that larger firms tend to attract more prestigious underwriters (Carter, Dark, & Singh, 1998). Reputable underwriters may perceive smaller firms as more risky and thus minimize association with such firms. In conclusion, firm size has an inverse relationship with an IPO's initial returns and its volatility.

Similarly, the age of a firm has served as a proxy for risk in previous IPO pricing research, i.e., more established firms are less risky (Carter, Dark, & Singh, 1998; Ritter, 1984, 1991). Firms that are younger will have fewer years of published financial data and are less likely to have been assessed by financial analysts (Rasheed, Datta, & Chinta, 1997). As argued by Ritter (1984), a positive relationship exists between the levels of underpricing and the ex-ante uncertainty on the firm value. Older firms are more established and have more information made available to the public, thus older firms generate less ex-ante uncertainty and the expected underpricing on the first day is lower. These conjectures are empirically supported by Su and Fleisher (1999), Loughran and Ritter (2004) and Chanine (2008), i.e., a negative

relationship exist between firm age and underpricing. Likewise, Engelen (2010) has also documented that age has a negatively significant relationship with an IPO's initial returns. Similar results were documented by Megginson and Weiss (1991), Mikkelson, Partch, and Shah (1997) and Ritter (1998). The possible causes might be that, the older non high-tech companies have stable and persistent income, thus there isn't a need to underprice their stocks to attract the investors. This may not be the case for the younger high-tech companies; they may neither have past revenue records nor earn any profits, and their stocks are not attractive to the large institutional investors, so underpricing the stocks seems to be their only option, (Karlis, 2000). In a recent study in Bangladesh, Islam, (2010) examined the underpricing levels in IPOs and the determining factors at the stock exchange in Dhaka (DSE). The main trends in the underpricing levels and overpricing were carried out on an annual basis and according to the various industries. The regression analysis revealed that firm age did not have a prominent effect on the underpricing levels of IPOs in DSE.

Minimal research had been undertaken in terms of financial variables and its impact on the initial returns and its volatility. Chan et al. (2004) suggested that the IPO shares are significantly undervalued compared to the entire market based on price-earnings ratios and book to market ratios. The author added that the initial returns on the first trading day are a reflection of pricing discrepancy and they suggests that investors are not overconfident in bidding up the stock prices on the first day of trading. They also argued that their results are inconsistent with the asymmetric information models of IPO pricing and provide support for behavioral theories based on investor overconfidence. Beatty et al., (2000) examined the relationship between IPO stock values and information available from financial statements. They found that accounting book value, earnings and revenue and several other firm and market characteristics seem to explain a large portion of IPOs' offer prices. Drawing from the above literature, the following framework is conceptualized.

Conceptual Framework

Figure 1: Impact of Signaling Variables, Firm Characteristics and Financial Indicators on IPOs' Initial Returns and Its Volatility
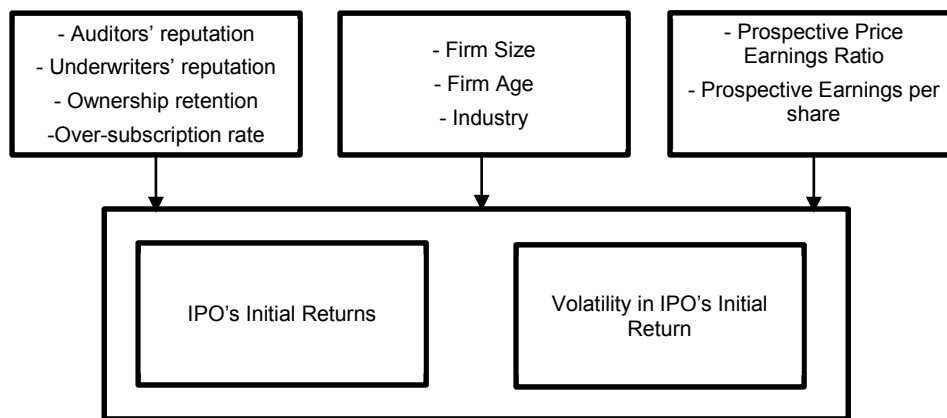
METHODOLOGY

Data for this study was collected from various sources, which includes Bloomberg, Datastream, ThomsonOne.com, EMIS and CEIC. The following variables were identified and collected for the period 2008 – 2012; offer price, first day closing price, auditor, and underwriter, date of incorporation, date of floating, market capitalization (size), industry, price - earnings ratio and earnings per share.

Hierarchical regression was performed on all the three blocks of variables. Subsequently, a step-wise regression was undertaken to further test on the significance of the relationship amongst the abovementioned variables. Both the hierarchical and step-wise regression was performed on the initial returns and volatility of initial returns of IPOs. The calculation of the IPO's initial return volatility is based on Lowry's (2010) model, whereby the variance on the error of the first regression is assumed to be related the same independent variables from regression (1) as shown below. The advantage of using this approach is that it allows detailed analysis on the influence of each characteristic on the variability in initial returns.

$$R_{it} = \beta_0 + \beta_1 \text{Retn}_{it} + \beta_2 \text{AudR}_{it} + \beta_3 \text{UWriterR}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Age}_{it} + \beta_6 \text{Industry}_{it} + \beta_7 \text{EPS}_{it} + \beta_8 \text{DY}_{it} + \varepsilon_i \qquad (1)$$

$$\text{Log}\left(\sigma^2(\varepsilon_i)\right) = \beta_0 + \beta_1 \text{Retn}_{it} + \beta_2 \text{AudR}_{it} + \beta_3 \text{UWriterR}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Age}_{it} + \beta_6 \text{Industry}_{it} + B_7 \text{EPS}_{it} + \beta_8 \text{DY}_{it} + \varepsilon_i \qquad (2)$$

Whereby:

IR_{it} = initial returns of company i at year t
$Retn_{it}$ = ownership retention of company i at year t
$AudR_{it}$ = auditors' reputation of company i at year t
$Size_{it}$ = size of company i at year t
Age_{it} = age of company i at year t
$Industry_{it}$ = industry of company i at year t
EPS_{it} = earnings per share of company i at year t
DY_{it} = dividend yield of company i at year t

Along with Ibbotson and Jaffe (1975) and Ibbotson, Sindelar and Ritter (1988, 1994), the measurement for initial return (IR) is:

$$IR_i = (PC_i - PO) \div PO_i$$

PCi and POi are respectively the average closing price of trading on the first day and the offer price of firmi.

Ownership retention refers to the original owners retained in the company during the IPO process against the total number of shares issued to the public. It is calculated as below;

Total number of shares issued – total number of shares retained by owners) / Total number of shares issued x 100%.

As for Auditor's reputation, it is identified based on the Big-4 and non-Big-4. If the auditors employed by the companies are one of the Big-4 audit firms, a dummy variable of 1 will be used and 0 otherwise. Underwriter's reputation will be identified based the market capitalization of the companies underwritten by the investment bank for any particular year. Age of the company refers to the difference between the date of incorporation of the company as a private limited company and the date it was listed as a public company. The size of the company will be calculated based on the number of shares issued by the company multiplied by the final offer price of the company; Size = Offer price x number of shares issued.

Both the financial information on the prospective earnings per share (EPS) & prospective Dividend Yield is extracted directly from the company prospectus.

ANALYSIS AND DISCUSSION

Prior to undertaking the hierarchical and stepwise regression, a descriptive analysis is performed and the results are discussed below.

Descriptive Statistics

Table 1 is the summary of the descriptive statistics for the signaling variables, firm characteristics and the financial variables. It reveals the outcomes for the mean, standard deviation, minimum, maximum, and kurtosis from year 2008 to 2012 for the listed IPOs on the Bursa Malaysia.

Table1: Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
LNIR	-1.227	1.290	0.0753	0.322
UwR	0.1	51.8	9.906	13.552
AUD	0	1	0.46	0.5
ORetn	-0.304	0.3179	0.048	0.100
OSubs	0.00	1.49	0.33	0.465
EPS	6.07	19.02	11.65	4.75
DY	0.13	0.35	0.21	0.082
FS	20.57M	41.6B	1.05B	4.72B
FA	3	43	10.81	6.709
Observations	228	228	228	228

LN_IR – Initial returns, AuD – Reputation of Auditors, UwR – Reputation of Underwriters, OSubs – Over-subscription Rate
EPS – Earnings per Share, DY – Dividend Yield, FA – Firm Age, FS – Firm Size.

Hierarchical Regression on the Initial Returns of IPOs

Table 2 shows the adjusted R^2 for Models 1 - 3. The signaling variables comprises of ownership retention, auditors' reputation, underwriters' reputation and over-subscription rate. Prospective earnings per share and dividend yield represent the financial variables, whilst the firm characteristic is represented by firm size, firm age and industry. The dependent variable used is in this study is IPOs' initial returns. The results designate a $p<0.05$ for Model 1, indicating that the signaling variables in general has a significant relationship with the dependent variable, i.e., the initial return of IPOs. As for model 2 and 3, it shows no significance ($p>0.05$). The next step in the analysis is to determine which of the variables representing the signaling variables, firm characteristics and the financial variables are significant.

Table 2: Hierarchical Regression Results for IPOs' Initial Returns

Model	Adjusted R^2	Significance
1	22.2%	0.000***
2	21.8%	0.505
3	21.3%	0.510

*Table 2 shows the adjusted R² for all models. Model 1 refers to the signaling variables, whilst Models 2 and 3 comprises of financial variables and firm characteristic respectively. *** indicates significance at the 1% level.   The dependent variable used is IPOs' initial returns.*

Stepwise Regression on the Relationship between the Signaling Variables, Firm Characteristics and the Financial Variables and the Initial Returns of IPOs

The following section analyses the results of the stepwise regression to further test on the significance of the relationship between initial returns and the respective signaling variables, i.e., ownership retention, auditors' reputation, underwriters' reputation and over-subscription rate. Table 3 demonstrates the findings of the stepwise regression. It is noted that only over-subscription rate (appearing in Model 1 of the

hierarchical regression) has a statistically significant relationship with IPOs' initial returns. The rest of the variables indicate no significance when regressed against the initial returns of IPOs. Over-subscription rate refers to a company's share being over-subscribed, i.e., the application for these shares are greater than the number of shares issued for sale by the company going public. Over-subscription signals to potential investors in the secondary market on the credibility of the company that is going public. A company's IPO is over-subscribed when potential investors feel that the company has future prospects in maximizing shareholders' wealth in terms of an increase in the share price in the secondary market or potential future dividends. These are the conceivable reasons for the positive relationship between over-subscription and initial returns of IPOs.

Table 3: Results of the Stepwise Regression for IPOs' Initial Returns

Variables	Coefficient	t-stats	Significance
(Constant)		-0.132	0.895
Ownership Retention	-0.098	-1.124	0.263
Auditors Reputation	0.061	0.675	0.501
Underwriters Reputation	-0.052	-0.598	0.551
Over-subscription rate	*0.485*	*5.451*	*0.000****
Prospective EPS	0.078	0.850	0.397
Prospective dividend yield	-0.024	-0.273	0.786
Firm Size	0.025	0.255	0.800
Firm Age	0.099	1.105	0.272

Table 3 shows the coefficient and the significance on the relationship between the signaling variables, financial variables and firm characteristics. *** indicates significance at the 1% level. The dependent variable used is IPOs' initial returns.

The following section looks into the relationship between signaling variables, financial variables and firm characteristics on the volatility of IPOs' initial returns.

<u>Hierarchical Regression on the Volatility of Initial Returns of IPOs</u>

Table 4 illustrates the results for the R2 for the financial indicators, encompassing prospective earnings per share and dividend yield. The results show a p-value < 0.05, indicating that model 2 has a significant relationship with the dependent variable, i.e., the volatility of IPOs' initial return. This is an interesting finding as the results differ from the earlier section when the hierarchical regression was performed against the initial returns. Model 1 which refers to the signaling variables comprising of ownership retention, auditors' reputation and underwriters' reputation and over-subscription rate and model 3 which refers to the firm characteristics (firm size, firm age and industry) shows no significance. Both the models designate a p-value > 0.05. To examine further on the relationship of the respective variables against the volatility of IPOs' initial returns, a stepwise regression is performed and the results are shown in the next section.

Table 4: Hierarchical Regression Results for the Volatility IPOs' Initial Returns

Model	Adjusted R^2	Significance
1	2.0%	0.443
2	*4.2%*	*0.034***
3	2.6%	0.865

Table 4 shows the adjusted R^2 for all models. Model 1 refers to the signaling variables, whilst Models 2 and 3 comprises of financial variables and firm characteristic respectively. ** indicates significance at the 5% level. The dependent variable used is volatility of IPOs' initial returns.

<u>Stepwise Regression on the Relationship between the Signaling Variables, Firm Characteristics and the Financial Variables on the Volatility of IPOS' Initial Returns</u>

Model 2 comprises of prospective earnings per share and dividend yield. Prospective dividend yield refers to the dividend forecast by the company that is going public and it is the yield investors are expected to earn on their investment in the IPOs. The result of this study shows a negative relationship between the prospective dividend yield and the volatility of IPOs' initial returns. The negative relationship indicates that the higher the dividend yield, the lower the volatility in initial returns. Prospective dividend seems to play a role in creating investors' confidence in a company, thus minimizing any major fluctuation in the demand for the IPOs when it enters into the secondary market. This ultimately reduces the fluctuation or volatility in the IPOs' initial returns. As for the rest of the variables, no significance is documented.

Table 5: Results of the Stepwise Regression for Volatility of IPOs

Variables	Std Coefficient	t-stats	Significance
(Constant)		0.713	0.478
Ownership Retention	0.125	1.292	0.199
Auditors Reputation	0.076	0.780	0.437
Underwriters Reputation	0.008	0.078	0.938
Over-subscription rate	-0.132	-1.337	0.184
Prospective EPS	0.059	0.583	0.561
Prospective dividend yield	*-0.242*	*-2.449*	*-0.016***
Firm Size	-0.010	-0.088	0.930
Firm Age	0.054	0.538	0.592

*Table 5 shows the coefficient and the significance on the relationship between the signaling variables, financial variables and firm characteristics. *** indicates significance at the 1% level. The dependent variable used is volatility of IPOs' initial returns.*

CONCLUSION

The purpose of this study is identify the significance of signaling variables (auditors/underwriters' reputation, ownership retention & over-subscription rate), firm characteristics (firm size, age & industry) and financial indicators (price-earnings ratio & earnings per share) on IPOs' initial return and volatility of initial returns. Two main test were performed; hierarchical analysis and stepwise regressions. A total of one hundred and forty eight companies that went public from 2008 – 2012 is used in this study. Hierarchical and stepwise regression is adopted as the variables were classified into three main categories, i.e., signaling variables, financial variables and firm characteristics.

The above-mentioned variables were regressed against two independent variables; IPOs' initial returns and IPOs' volatility of initial returns. When the independent variables were regressed against the initial return of IPOs, it is noted that the over-subscription rate has a significant impact on the initial returns. It is conjectured that over-subscription sends a signal to potential investors on the future prospects of the company. This excites investors and increases their confidence level on the IPOs (part of behavioral aspect of finance), resulting in an increased demand for the IPOs on the first day of trading in the secondary market. This increased demand causes the first day's closing price to increase, subsequently a high initial return ensues.

Interestingly, the results differ when regressed against the volatility of IPOs' initial returns, whereby the financial variable, i.e., prospective dividend yield stated in the prospectus seems to have a significant negative relationship with the volatility of initial returns. It is conjectured that high prospective dividend yield minimizes the fluctuation in IPOs' initial returns. This would be a contribution to the Malaysian literature since no study has been undertaken on the volatility of IPOs and it is interesting to note that prospective dividend yield has an impact on it. In conclusion, the empirical results dictate that IPOs' initial returns and volatility of initial returns in Malaysia do not seem to be affected largely by endogenous factors (except for the results on the prospective dividend yield).

Limitation of this study includes data availability as some of the company's prospectuses are not available and certain information had to be hand-collected which is extremely time-consuming. Nevertheless, IPOs warrant future research, predominantly examining the roles of exogenous factors such as political connection, regulatory changes and other macro variables' impact on the IPOs' initial returns and the volatility of initial returns in Malaysia. It is also envisioned that a bigger dataset could be used, which may take into account governance factors such as roles of board of directors on IPO's initial return and its volatility. Cross-country analysis would also be a major contribution to the literature as differences in governance and regulatory framework may impact the IPOs' initial returns and volatility.

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