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Abstract

Purpose – The purpose of this paper is to examine the direct and indirect impact of firm-specific characteristics on the level of underpricing among Malaysian initial public offerings (IPOs).

Design/methodology/approach – Content analysis of IPO prospectuses was used for 331 firms underwent listing between 2002 and 2008. The extent of disclosure was computed by applying the disclosure index of Bukh *et al.* (2005).

Findings – Of the five firm characteristics examined, there is a direct relationship between the firm's financial performance and the level of foreign activity, and the level of underpricing, instead of being mediated through disclosure. However, some firm characteristics have direct influence on the extent of disclosure but do not have any influence on underpricing.

Research limitations/implications – This empirical study concentrates on the Malaysian IPOs on a single disclosure mechanism. Other disclosure items can be examined together with the intellectual capital disclosure items.

Practical implications – As the findings reveal that the extent of disclosure is relatively low in influencing the level of underpricing. Had the disclosure been higher, it may have some influence on underpricing. The accounting governance board need to regulate the disclosures of the intangible resources so that the level of underpricing can be minimized.

Originality/value – This study provides new insight for the examination of direct and indirect (through disclosure) association between firm-specific characteristics and underpricing. The findings shed some lights to the IPO issuers to enhance disclosure so that the cost of capital can be reduced.

Keywords IPO, Disclosure, Malaysia, Intellectual capital, Mediator, Underpricing

Paper type Research paper

1. Introduction

Over recent decades, the industrial economy, during which material resources were mainly employed, has moved toward a knowledge-based economy where components of business resources are intangible in nature and intellectual capital (IC) forms a significant portion of the intangible resources.

However, there is yet any accounting standard that could fully account for intellectual resources due to problems with recognition, measurement and valuation. In Malaysia, the Malaysian Accounting Standard Board has adopted Malaysian Financial Reporting Standard (MFRS) 138 ("Intangible Assets") to account for the intangible resources but it fails to account fully for intangible resources, partly because their characteristics do not always meet the stipulated recognition criteria.

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For instance, many intangible resources, such as staff skills, training, management, technical talent, market share, customer relationships and loyalty, fail to meet the definition of intangible assets because an enterprise has insufficient control over the expected future economic benefits arising from such items (Chow *et al.*, 2010), so they are not treated as assets, but are expensed instead. Consequently, it is conceivable that a company's intangible assets may be higher than the book value, possibly by a margin of three to four times (Edvinsson and Malone, 1997).

Any firm that has significant investment in IC but does not provide appropriate disclosures, may be at a substantial competitive disadvantage and its financial reports may understate the firm's true value (Arcelus *et al.*, 2005; Edvinsson, 1997; Firer and Williams, 2003; Pulic, 1998; Stewart, 1997; Sveiby and Barchan, 2000). This may create uncertainty over the firms' future earnings (Burgman and Roos, 2007; Williams, 2001) and create agency problems. Any information held by the firm's managers but not by its owners (i.e. information asymmetry) may create agency problems and may lead to a variety of issues including insider trading, inaccurate evaluation of the firm's growth potential and increase its cost of capital.

It may be possible to close the information gap by providing additional disclosure of IC elements in annual reports, initial public offering (IPO) prospectuses, web sites and, etc. This study considers IPO prospectuses as an avenue to disclose information on IC (hereinafter referred as "disclosure"). Prior research that does provide any disclosures has focussed mainly on annual reports. Disclosure in the IPO prospectuses have received minimal attention (Bukh *et al.*, 2005; Singh and Van der Zahn, 2007), especially in Malaysia where the research has focussed almost exclusively on annual reports (Foong *et al.*, 2009; Goh and Lim, 2004; Ousama *et al.*, 2011) and only more recently on IPO prospectuses (Azwan *et al.*, 2012; Too and Somasundaram, 2010, 2011). Moreover, IPO firms have a limited information environment because they have minimal public historical information, no secondary market and a comparatively short operating history, which creates high valuation uncertainty for investors (Strom, 2006). Consequently, greater prospectus disclosures may be an important step in minimizing the investment risk attached to IPOs, and by extension, help to minimize the level of underpricing.

This study focusses on disclosure in the Malaysian IPO prospectuses. Since the year 2000, Malaysia has been committed to a decision strategy to transform its production-based economy to a knowledge-based economy so that the country can achieve a developed nation by year 2020. As a result, it can be expected that there will be an increasing investment of intangible resources in the business entities. For instance, as contended by Norhana *et al.* (2010), the intangible assets had increased in the Malaysian market which representing about 44 percent of the corporate market value in the year 2006. With the influx of the intangible resources and when there is an incomplete disclosure by the business entities, it will widen the information gap between the informed and uninformed decision makers, especially investors (Singh and Van der Zahn, 2007). As a result, a higher cost of going public, which is normally known as "underpricing," may be experienced by the IPO firms, when the information asymmetry gap is getting larger. Underpricing is considered as the compensation to the uninformed users for undertaking risk of investment in a firm with greater uncertainties of future growth, which also reflects the cost of capital for the IPO firms. In view of the importance of additional disclosure to reduce the level of underpricing of the IPO issues, this study offers the possibility that disclosure could be used as a contingent in reducing the information asymmetry gap among the users, thus resulting in the reduction of the level of underpricing of the IPO firms.

Relevant underlying theories and reviews of the literature on underpricing reveal that IPO firm-specific characteristics also have certain impact on the level of underpricing. In addition, firm-specific characteristics are also associated with the extent of disclosure. While most studies focus on the impact of firm-specific characteristics on the level of underpricing and the extent of disclosure, there is limited study that specifically considers the indirect impact of firm-specific characteristics on the level of underpricing via disclosure. As such, this study fills in the gap by examining the direct or indirect effect (via disclosure) between the characteristics of the IPO firms and the level of underpricing. In other words, this study offers a possibility that disclosure could play a mediator role for the impact on the level of underpricing in the IPO issues in which the empirical support for the mediator role of disclosure has yet to be carried out.

In essence, this study aims to narrow the gap in the IC disclosure literature by focussing on the IC disclosure of the Malaysian IPO prospectuses. More importantly, this study contributes to the body of knowledge by examining the mediation role of the IC disclosure on the level of underpricing. The remainder of this paper is organized in the following manner. Section 2 provides a review of literature together with the hypotheses development, while the methodology is explained in Section 3. Results of the study and the discussions are presented in Section 4. The implications of current study, together with the limitations and recommendations for future research are offered in Sections 5 and 6, respectively. Finally, our concluding remarks are presented in Section 7.

2. Literature review and hypotheses development

Disclosure of additional relevant information could reduce the uncertainty over the valuation of firm and reduce its cost of capital, resulting from the reduction in the level of information asymmetry between the management and the decision makers (Verrecchia, 2001). Furthermore, additional disclosure may allow potential investors to evaluate the effectiveness, performance and full discharge of the management's responsibilities toward the stakeholders. It is important for the organization to satisfy a broader group of interested stakeholders, whose interests are more than just financial in nature. This has raised the importance of the disclosure of additional information for useful decision making, particularly the IC elements. Insufficient disclosure of a firm's affairs may result in higher cost of capital being attached to the firm's valuation, i.e. higher level of underpricing, being experienced by the IPO firm.

2.1 IPO underpricing and disclosure

One phenomenon with IPO is that it tends to be underpriced (Dimovski and Brooks, 2004; Kooli and Suret, 2004; Ritter, 1998). An underpriced IPO refers to a situation when the offer price is lower than the closing price on the first day of trading (Strom, 2006) and is normally regarded as the cost of going public (Ritter, 1987, as cited by Derrien and Kecskes, 2007). This higher initial return is associated with greater valuation uncertainty for a particular IPO issue. In short, IPO underpricing is known as a positive gain of a new issue immediately after flotation and it is a recurring phenomenon in many markets (Brealey and Myers, 2002; Yong and Isa, 2003).

Underpricing phenomenon has been tested and existed in various developed markets such as in the USA (Ibbotson *et al.*, 1988), London (Levis, 1990) and Sweden (Strom, 2006), to cite a few. In addition, it has been reported that the average underpricing in the Pakistanis IPOs from year 2000 through 2006 was 36 percent (Muhammad Khalid and Abdul, 2009). By comparison of IPO underpricing between developed and developing nation, Loughran *et al.* (1994) contended that the IPO underpricing is higher in the developing markets than in the developed markets when tested for 25 countries.

In Malaysia, various researches have been conducted to investigate the level of underpricing. As cited by Yong and Isa (2003), Dawson (1987) reported a positive average initial return of 166.7 percent for 21 new issues from 1978 to 1983. Loughran *et al.* (1994) reported an average initial return of 80.3 percent for 132 IPOs from 1980-1991. Yong (1997) documented an average initial return of 75 percent for 224 IPOs listed from January 1990 to December 1994. In addition, How *et al.* (2007) demonstrated an average underpricing of 102 percent for 322 companies listed in the Second Board of Bursa Malaysia between years 1989 to 2000. Furthermore, Murugesu and Santhapparaj (2009) recorded a 37 percent average underpricing for IPO firms that underwent listing between the years 1999-2004. Hence, based on the literature reviews of underpricing in Malaysia, most of the empirical evidences support the underpricing scenario.

In a nutshell, the underpricing issue is prevalent in various countries, encompassing both developing and developed nations. There are various reasons for underpricing. First, higher underpricing has been considered as a compensation for the risk undertaken by the investors especially for firms with higher uncertainties for growth. Second, underpricing is provided to prevent from lawsuits from unhappy investors (Yong and Isa, 2003). Third, in accordance with the information asymmetry hypotheses, if managers have better information than potential investors, a higher degree of underpricing is necessary in order to attract investment from the investors. This argument is further supported by Rock (1986) that uninformed investors will, on average, be provided with a higher level of underpricing as compensation for lack of information obtained. Therefore, the availability of information affects investors' behavior and also the capital raising strategy of a firm. Furthermore, as argued by Chan (1983) that the level of capital the issuing firm wishes to raise depends on investors' behavior, which in turn, is influenced by the availability of information. In essence, the availability of information for decision-making associates with the level of underpricing determined by the IPO issuers, and thus, the following hypothesis is formed:

H1. Disclosure reduces the level of underpricing.

2.2 Firm-specific characteristics, disclosure and IPO underpricing

Disclosure is regarded as supply of additional information to aid in the decision-making strategy of the investors. It is regarded as essential in reducing the information asymmetry gap between the informed and uninformed users. As such, it is used as an essential element in reducing the share valuation problem which would reduce the risk of share investment. As the information pertaining to IC is supplementary, the extent of disclosure can be influenced by various factors such as firm-specific characteristics.

Firm-specific characteristics may also have an influence on the level of underpricing. One of the well documented theories that relates to the IPO underpricing is the signaling theory (Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989). The signaling theory asserts that there are mainly two reasons that a better quality IPO firm tends to have higher underpricing than the lower quality counterparts. First, higher underpricing by the better quality IPO firms enable the firms to distinguish themselves from the lower quality counterparts. Second, better quality IPO firms can afford to underprice the initial offerings and they found it more worthwhile to do so as they could sell subsequent seasoned equity offerings at a more attractive price.

In short, firm-specific characteristics play an important role in influencing the level of disclosure and the level of underpricing. The strength of the relationship among the variables can be extended through the examination of the direct and indirect effect (via disclosure) between the attributes of IPO firm with the level of underpricing. Therefore, subsequent sections provide discussion on whether firm-specific characteristics have direct relationship with the level of underpricing, or if they rely on the disclosure as a mediator for the impact on the level of underpricing in the IPO issues. Firm-specific characteristics that are being examined in this study are operating history, size, performance, level of foreign activity and the type of industry sector to which the firm belongs to.

2.2.1 Firm operating history. A younger firm tends to have higher risk of sustainability in the capital market. In order to enhance the investment decision and to reduce the uncertainty of future potential of the firm, the younger corporation needs to provide more information to reduce the agency costs between the management and its potential shareholders. However, not all studies support this notion as there are contradictory evidences in prior studies. Li *et al.* (2008) found significant negative association between the companies' length of listing with the extent of disclosure in the annual reports for companies listed in the London Stock Exchange. In the Malaysian IPO environment, Azwan *et al.* (2012) has also demonstrated a negative association between both variables. On the other hand, Singh and Van der Zahn (2008) and White *et al.* (2007) found positive association between these two variables, while Bukh *et al.* (2005), Cordazzo (2007) and Sihotang and Winata (2008) found no significant association between these two variables. In short, the empirical evidence on the relationship between the firm's operating history and disclosure is mixed.

Since the younger firm is bearing a higher risk, the investors may be more worried about the future performance of the recently established firms than the well-established ones. In other words, since a younger firm is more risky for investment purpose, a higher underpricing is expected. For example, as indicated in the study by Carter *et al.* (1998) and Engelen and Van Essen (2010), higher level of underpricing has been observed in lesser established firms. However, the results from Singh and Van der Zahn (2007) did not indicate any significant relationship between the operating history of the Singapore IPO firms with the level of underpricing. Based on the discussion, the following hypotheses are relevant on the tripartite relationship among the firm operating history, disclosure and the level of underpricing:

H2a. There is a significant relationship between the firm operating history and the extent of disclosure.

H2b. There is a significant relationship between the firm operating history and the level of underpricing.

H2c. Disclosure mediates the relationship between the firm operating history and the level of underpricing.

2.2.2 Firm size. Firm size influences the amount of investment in the IC elements due to the availability of resources and higher disclosure is encouraged from the larger size of firm due to the political cost. In accordance to the Institutional Theory, the process of accumulating and reporting information adds to cost, and it usually can be afforded by a larger firm than a smaller one. In addition, a larger firm is relatively exposed to the scrutiny by government agencies and public (Flostrand and Strom, 2006). Most of the prior literature supported size as a factor influencing the extent of disclosure where larger firms have shown to be disclosing more IC information than the smaller ones (Bozzolan *et al.*, 2003; Cordazzo, 2007; Guthrie *et al.*, 2007; Li *et al.*, 2008; Oliveira *et al.*, 2006; Saenz and Gomez, 2008; Sihotang and Winata, 2008; Striukova *et al.*, 2008; White *et al.*, 2007), as opposed to the study by Azwan *et al.* (2012) and Bukh *et al.* (2005) who demonstrated an insignificant association between both variables.

IPO firm size may attract stakeholder's scrutiny. Therefore the political cost may be higher than a smaller firm. The additional political cost that is incurred by the IPO firms may lead to lower underpricing. Other rationale for a lower underpricing which is associated with a larger IPO firm is that lower risk is anticipated for a larger and more established firm, thus lower underpricing is expected. Lower underpricing as experienced by larger firms has been supported by prior studies. For example, Carter *et al.* (1998) demonstrated a negative association between the firm size and the level of underpricing for 2,292 IPO firms underwent listing in the US primary market from 1979 to 1991. In addition, lesser underpricing has been experienced by a larger firm is also supported by Muhammad Khalid and Abdul (2009) for 50 IPO firms in Pakistan, and Singapore IPO firms (Singh and Van der Zahn, 2007). In essence, firm size influences both the disclosure and underpricing, and disclosure may have an influence on the level of underpricing. As such, it is essential to examine if disclosure could mediate the relationship between the firm size and the level of underpricing, of which they are hypothesized as follows:

H3a. There is a significant relationship between the firm size and the extent of disclosure.

H3b. There is a significant relationship between the firm size and the level of underpricing.

H3c. Disclosure mediates the relationship between the firm size and the level of underpricing.

2.2.3 Firm performance. Highly profitable firms are expected to be more likely to disclose information to avoid undervaluation of their shares. In addition, profitable firms are likely to be scrutinized by the government agencies and public. As such, it is expected that a more profitable firm will disclose more IC information in order to remain legitimate. As the provision of additional information required is costly, more profitable firms are willing to absorb the costs of providing additional information. Review of prior literature indicated that the study of the influence of the firm's profitability on the extent of disclosure is limited and the results are not conclusive (Chang *et al.*, 2009; Li *et al.*, 2008; Oliveira *et al.*, 2006).

On the other hand, highly profitable firms provide the signal that they are better quality firms as compared to their lesser profitable counterparts. As such, the highly profitable firms are perceived to be better quality which may indicate lower risk firms and thus, lower level of underpricing is expected by the investment community. There is limited study on the influence of firm performance on the level of underpricing in the literature. As such, whether the impact on the level of underpricing is more significant, either from the direct influence of firm performance or indirect influence via disclosure is being examined and thus, it is hypothesized that:

H4a. There is a significant relationship between the firm performance and the extent of disclosure.

H4b. There is a significant relationship between the firm performance and the level of underpricing.

H4c. Disclosure mediates the relationship between the firm performance and the level of underpricing.

2.2.4 Industry sector. Political costs vary across industry sectors. Companies belonging to the same industry sector have similar political costs. Different industries have different characteristics in relation to the types of competition, their business impacts to the society and hence, the type of information provided to the relevant users also differs. In other words, it is notable that firms belonging to a particular industry sector have different disclosure incentives compared to firms in another industry sector. As such, the nature of the industry is argued to affect the levels of additional disclosure in order to reduce the political vulnerability of the firm. Empirical studies indicate that there are mixed results on the association between the type of industry sector and the extent of disclosure. Various studies (e.g. USA, Italy and Portugal) found significant association between the industry sectors with the extent of disclosure, whereby highly intangibles intensive companies disclosed more than the lower intangibles intensive companies. Various methods of classification of industry sectors are being used and the results are significantly related to the extent of disclosure (Abdolmohammadi, 2005; Bozzolan *et al.*, 2003; Bukh *et al.*, 2005; Oliveira *et al.*, 2006). However, Cordazzo (2007) did not find any association, while Azwan *et al.* (2012), Saenz and Gomez (2008) and Striukova *et al.* (2008) found negative association between these two variables.

The types of industry reflect the variance of risk level. As the level of underpricing is a reflection of the risk undertaken for the investor in the IPO investment, the level of underpricing may vary among industry sectors. Singh and Van der Zahn (2007) found that the impact of disclosure on the level of underpricing is stronger for the IPO firms which are IC intensive as compared to the "old economy" firms in Singapore. Similarly, extent of underpricing in the IPO of high-tech firms is significantly higher than IPO of other firms for 21 countries as examined by Engelen and Van Essen (2010). On the other hand, there has been no difference in the level of underpricing between the financial and non-financial sectors for a sample of 50 IPOs tested in the Pakistani IPO market between year 2000 and 2006 (Muhammad Khalid and Abdul, 2009). The tripartite relationship between the nature of industry, disclosure and the level of underpricing can be hypothesized:

H5a. There is a significant relationship between the type of industry sector and the extent of disclosure.

H5b. There is a significant relationship between the type of industry sector and the level of underpricing.

H5c. Disclosure mediates the relationship between type of industry sector and the level of underpricing.

2.2.5 Foreign activity. Firms are prone to disclose higher information if their activities have extended to overseas, as they may need to show their international presence to stakeholders. Stakeholder Theory pronounces the existence of a social contract between the corporation and its stakeholders (Roberts, 1992). It recognizes that there is a direct effect that the stakeholders may have on the management decisions about a corporation's activities and reporting. The organizations will opt to provide for additional disclosure on their intellectual, social and environmental performance so that the expectations of the stakeholders could be met. In other words, the more critical a particular stakeholder is regarded for continued viability and success of the firm, the more it needs to meet the expectation of that stakeholder. In essence, the identification of different types of information that are being disclosed in the reporting documents signifies the type of stakeholders' expectation that the companies are attempting to fulfill (Guthrie *et al.*, 2007). In addition, as highlighted by Abhayawansa and Abeysekera (2009) the requirement of IC information for investment decision by the buy-side analysts and retail investors are influenced by the extent of globalization of the targeted firms.

Empirical studies on the influence of foreign activity with the extent of additional non-financial disclosure are limited. It has been demonstrated that the extent of foreign activity has some influence on the increased voluntary disclosure (Depoers, 2000; Raffournier, 1995). However, Oliveira *et al.* (2006) found no significant difference on the extent of disclosure for companies with higher or lower level of foreign activity level. As such, foreign activity as a motivator for increased disclosure is limited in the literature and coupled with some mixed empirical results. Due to the limited study on the influence of this variable on the extent of IC disclosure in particular, this variable requires further examination in order to enhance the body of literature.

In addition, the level of foreign activity of a firm signifies that it is a better quality firm due to its diversification prospect. A better quality firm is perceived as a lower risk investment, and thus, the level of underpricing is expected to be lesser as well. Empirical study on the level of foreign activity is limited, and thus, worth exploring. The hypotheses for the tripartite relationship between the level of foreign activity, disclosure and the level of underpricing are as follows:

H6a. There is a significant relationship between the level of foreign activity and the extent of disclosure.

H6b. There is a significant relationship between the level of foreign activity and the level of underpricing.

H6c. Disclosure mediates the relationship between the level of foreign activity and the level of underpricing.

In essence, the study on the influence of firm-specific characteristics with the extent of disclosure has been performed in the literature but inconsistent results obtained may warrant further examination in order to provide more justification on the contribution to the theoretical foundation, especially on the Malaysian primary market perspective. As the firm-specific characteristics have some influence on the level of underpricing, it is also essential to examine if the relationship is direct or through a mediator, i.e. disclosure.

3. Methodology

3.1 Measurement of variables

3.1.1 Extent of disclosure. The extent of disclosure for this study is obtained via the content analysis of the IPO prospectuses, by reference to the IC disclosure framework used by Bukh *et al.* (2005). The IC disclosure checklist adopted from Bukh *et al.* (2005), has been used for a study performed on the Danish IPO prospectuses, which contains 78 items, classified in six dimensions of three major categories (i.e. employee competence, external structure and internal structure). The IC checklists of Bukh *et al.* (2005) is chosen as it incorporates various input from research projects on IC statements, namely, Danish Agency for Trade Industry (DATI) research project and Danish Ministry of Science, Technology and Innovation (DMSTI) research project. As contended by Lonnqvist *et al.* (2009) that the use of Danish IC checklist can increase the managerial understanding of IC and allow the management to link it with the measuring and development of change process which relate to IC in the firms. In addition, this checklist seems to be for generic use and not country specific, which can be adopted in the Malaysian context as well.

In an attempt to measure the extent of intangibles disclosure provided in IPO prospectuses, a Disclosure Score Index (DSI) is computed. This index relates the number of indicators that an IPO prospectus contains to the total number of indicators given by the framework for collection of intangibles information. This method of collection of additional disclosure items have been commonly used in prior literature (Azwan *et al.*, 2012; Bukh *et al.*, 2005; Chau and Gray, 2002; Chow and Wong-Boren, 1987; Cordazzo, 2007; Ho and Wong, 2001; Meek *et al.*, 1995; Ousama and Fatima, 2010; Rimmel *et al.*, 2009). The formula to compute DSI is as follows:

$$DSI_j = \sum_{i=1}^{m_j} \frac{d_{ij}}{N}$$

This index measures the level of disclosure on intangibles for a company j, where $N = 78$ is the total number of indicators in the framework; d_{ij} is equal to 1 if indicator i is disclosed, and 0 otherwise; and m_j is the number of indicators disclosed by company j.

This research that applies the method of content analysis acknowledges two assumptions, and is consistent with prior literature of voluntary disclosure of corporate social responsibility. Two assumptions that are generally used in the corporate social reporting literature, which utilized content analysis as the basis of measuring the corporate social responsibility manner of a corporation (Unerman, 2000) are: first, it is assumed that higher number of IC disclosure signifies the importance of the items being disclosed. Second, corporations that are aware of IC elements are those that will discuss them as well as act on them. In short, it is assumed that the higher number of IC reporting signifies the importance of IC to the firm.

3.1.2 Firm-specific characteristics and level of underpricing. Five firm characteristics that are being examined in the present study include operating history, size, performance, industry sector and level of foreign activity. The measurements of these five variables and the level of underpricing are summarized in Table I.

Title	Description
Firm operating history	Number of days from the date of incorporation until the date of IPO prospectus
Firm size	Average sales
Firm performance	Net profit margin = average net profit/net sales.
Industry sector	Classification sector in the Bursa Malaysia Dummy variable of "1" is assigned for the IPO firms listed in the "technology" sector. Value of "0" is assigned for the other sectors
Foreign activity	Average of export sales/total sales
Level of underpricing	Initial return less the equivalent percentage change in the Bursa Composite Index (i.e. FBMKLCI), the formula as below: where, P_1 and MI_1 refers to closing share price and market index on the first day of trading, respectively, and P_0 and MI_0 refers to offer price and market index on the IPO date respectively: $\frac{P_1-P_0}{P_0}-\frac{MI_1-MI_0}{MI_0}$

Table I.
Measurement of variables

3.2 Sample selection: IPO firms

There were altogether 331 firms that underwent listing in the Malaysian Securities Exchange and offered their shares to the public between the period of 2002-2008. The breakdown of the firms into the respective year of listing is referred to Table II.

There were 86 firms belonging to the "technology" sector (approximately 26 percent) that underwent listing during 2002-2008. For the firms that were non-technology, amounted to approximately 74 percent of IPO firms, which were classified in the various industry sectors, namely, "consumer products," "industrial products," "construction," "trading/services," "infrastructure," "finance," "properties" and "plantation."

3.3 Data analysis method

The data collected are analyzed by using the path analysis via AMOS Version 18.0 software. It is a technique that can be used to estimate a series of separate, but interdependent, multiple regression equations simultaneously. In the current study, path analysis is used to examine for the relationship between disclosure and the firm-specific characteristics, e.g. operating history, size, performance, industry sector and the level of foreign activity. In addition, path analysis is also used to examine for the impact of disclosure on the level of underpricing and the mediation role of disclosure.

Year of listing	Number of firms
2002	48
2003	59
2004	71
2005	74
2006	36
2007	22
2008	21
Total	331

Table II.
IPO firms by year of listing

4. Results and discussion

4.1 Extent of disclosure

Over the seven-years period (2002-2008), the average extent of disclosure practiced by the firms that underwent listing was approximately 19 percent. This indicates that, on the average, firms disclosed about 14 out of a total of 78 IC items. Table III displays the analysis of the category of disclosure.

Among the three categories of IC, external structure has been the highest reporting item with the mean disclosure of 0.29. The second highest IC category was employee competence with the mean disclosure of 0.18, while internal structure being the least disclosure category with the mean disclosure value of 0.16.

External structure items refer to the information that the corporation discloses on its sales activities and the relationship with the customers. Customers have been placed as the most important stakeholders by the corporations that warrant for more disclosure in the IPO prospectus. This is attributable to the usefulness of this information to attract and retain both new and existing customers as they are considered as major contingent for the firms' future success. The results of this study agree with the study by Amrizah and Rashidah (2009). In their study, it has been demonstrated that the level of the categories of IC perceived by the management of Malaysian listed companies, is ranked by the following sequence, external structure~employee competence~internal structure.

Among the 14 elements in the external structure category, the highest reporting element as disclosed by more than 50 percent of IPO firms, in this category is the information on "description of customer relations." Among the 27 elements in the employee competence category, the elements that are mostly disclosed comprised the information on the "statement of the dependence on key personnel" and followed by the "statement of policy on competence development." As for the total of 37 elements in the internal structure category, the top disclosure element is the information on the "statement of corporate quality performance." In summary, more than half of the IPO firms are aware of the importance of and thus, providing disclosure on the customer relationship, dependence on key personnel, staff competency development and corporate quality performance in the IPO prospectuses for investors' decision making.

4.2 Level of underpricing

On the average, the initial offer of shares by the IPO firms had been experiencing a net underpricing of 23 percent. This indicates that the initial share price has been higher than the offer price for the IPO issue. The level of underpricing is consistent with other IPO studies in the Malaysian context (Loughran *et al.*, 1994; Murugesu and Santhapparaj, 2009; Yong and Isa, 2003).

4.3 Path analysis model fit

The path analysis results are depicted in Table IV.

Category of IC disclosure	Disclosure
External structure	0.29
Employee competence	0.18
Internal structure	0.16

Table III. Extent of IC disclosure by category

χ^2 goodness-of-fit test, i.e. the χ^2 statistic value of 1.37 with three degrees of freedom and a probability of more than 0.05 ($p = 0.71$), suggests that the hypothesized model adequately represents the sample data. In reviewing the other fit indices (Table V), the hypothesized model is relatively well fitting as indicated by the adjusted goodness-of-fit index (AGFI), comparative fit index (CFI) and goodness-of-fit index (GFI), which is around 0.99 respectively. In addition, the root mean square error of approximation (RMSEA) value is below 0.001, which is also below the recommended value of 0.08. In essence, results from the χ^2 statistic and the model fit indices indicate that the hypothesized model fits the observed data well, i.e., it is adequate and well fitted.

4.4 Path analysis results

4.4.1 Impact of IC disclosure on the level of underpricing. The following discussion is based on Table VI (unstandardized regression weights) and Table VII (standardized regression weights).

The unstandardized regression weight between the extent of disclosure and the level of underpricing is not significant by the critical ratio test ($0.655 < 1.96$, $p > 0.05$). Therefore, it can be concluded that the extent of disclosure does not have any impact on the level of underpricing for the Malaysian IPO issue. This result is consistent with the study of Schrand and Verrecchia (2004) who did not find any significant association

Table IV. χ^2 goodness-of-fit results

Model	NPAR	CMIN	df	p	CMIN/df
Default model	25	1.37	3	0.71	0.45
Saturated model	28	0.00	0		
Independence model	7	376.29	21	0.00	17.91

Table V. Model fit Indices

Fit indices	Results
AGFI	0.99
CFI	> 0.99
GFI	0.99
RMSEA	< 0.001

Table VI. Unstandardized regression weights

	Estimate	S.E.	C.R.	P
Disclosure←industry sector	−0.011	0.006	−1.705	0.088
Disclosure←operating history	−0.000	0.000	−1.105	0.268
Disclosure←size	−0.008	0.002	−3.604	< 0.001
Disclosure←performance	−0.092	0.020	−4.560	< 0.001
Disclosure←foreign activity	0.035	0.006	5.4905	< 0.001
Underpricing←disclosure	0.255	0.390	0.655	0.512
Underpricing←foreign activity	−0.096	0.046	−2.099	0.035
Underpricing←performance	−0.331	0.124	−2.663	0.007

when examining the level of underpricing with voluntary disclosure for certain industry sectors. The insignificant relationship in the current study may be due to relatively low level of disclosure in the Malaysian IPO prospectuses that is unable to reduce the information asymmetry gap.

4.4.2 Relationship among firm operating history, IC disclosure and level of underpricing. There are five firm-specific characteristics that are being examined in the current study to determine if they have any direct or indirect influence on the level of underpricing. The results are summarized in Tables VIII and IX.

The firm operating history is not seen to be an explanatory variable (critical ratio $= -1.105 < -1.96$; $p > 0.05$) for the extent of disclosure, which is consistent with the results from Bukh *et al.* (2005), Cordazzo (2007) and Sihotang and Winata (2008). The current findings suggest that the firm operating history is not pertinent to the extent of disclosure. As argued by Bukh *et al.* (2005) and Cordazzo (2007), the reason for such insignificant results could be that the cost of disclosure may have higher influence on the disclosure than the operating history.

Furthermore, the firm operating history is not effective in reducing the level of underpricing. The results of this study indicate that firm operating history is not helpful in influencing the extent of disclosure or level of underpricing in the IPO issue. In addition, the significant value for bootstrapping confidence interval for mediation at

	Estimate
Disclosure←industry sector	−0.112
Disclosure←operating history	−0.070
Disclosure←size	−0.273
Disclosure←performance	−0.275
Disclosure←foreign activity	0.293
Underpricing←disclosure	0.039
Underpricing←foreign activity	−0.125
Underpricing←performance	−0.154

Table VII. Standardized regression weights

Firm-specific characteristics	Effect of firm-specific characteristics on Disclosure	Underpricing
Firm operating history	No effect	No effect
Firm level of foreign activity	Positive effect	Negative effect
Firm size	Negative effect	No effect
Firm performance	Negative effect	Negative effect
Industry sector	Negative effect	No effect

Table VIII. Relationship between firm-specific characteristics with the level of disclosure and level of underpricing

	Operating history	Foreign activity	Size	Performance	Industry sector
Underpricing	0.526	0.201	0.143	0.162	0.129

Table IX. Bootstrapping confidence interval of indirect effects significance test

0.526 (> 0.05) suggests that there is no mediation effect for firm operating history and underpricing through disclosure.

In essence, the firm operating history is neither an explanatory variable for the disclosure nor effective in reducing the level of underpricing. In other words, the risk associated with an IPO is not affected by the years in operation of the firm, but it is affected by the activities engaged by the firm and the financial performance, which will be discussed hereafter.

4.4.3 Relationship among firm size, disclosure and level of underpricing. The standardized regression weight results indicate that the firm size is significantly and negatively associated to the extent of disclosure ($\beta = -0.273$, $p < 0.001$). This result is consistent with previous empirical study of Singh and Van der Zahn (2008). It indicates that the smaller firm seems to have invested more in the IC elements and thereupon provided more disclosure than the larger firm. Results from this study signify that the larger firm may be exposed to the political risk. As contended by Flostrand and Strom (2006), that a larger firm is relatively exposed to the scrutiny by government agencies and public, thus it is expected to bear higher political cost.

However, no significant relationship could be observed for the impact of firm size on the level of underpricing, indicating that firm size is not relevant in reducing the level of underpricing. In addition, the significant value for bootstrapping confidence interval for mediation is 0.143 (> 0.05) suggesting that there is no mediation effect for firm size and underpricing, through disclosure.

4.4.4 Relationship among firm performance, disclosure and level of underpricing. The firm performance is seen to significantly influence the degree of disclosure, with the standardized regression weight, $\beta = -0.275$ ($p < 0.001$). This result demonstrates that better performing firms disclose lesser IC information than the weaker firms. Earlier studies have shown that there are mixed results pertaining to the association between firm performance with disclosure, i.e. positive association (Li *et al.*, 2008), no association (Oliveira *et al.*, 2006) and negative association (Chang *et al.*, 2009). The result of the current study is consistent with the result of Chang *et al.* (2009) and the reason for the negative association may be attributable to the fact that the weaker firms are trying to boost their image by disclosing more IC information in their IPO prospectuses. This disclosure strategy may permit the firm to promote for better future performance as it has been contended by Saenz and Gomez (2008) and Sveiby and Barchan (2000) that the higher the extent of disclosure, the better is the reputation gained by the corporation.

The standardized regression weight results for the association between firm performance and the level of underpricing indicates a significant negative results ($\beta = -0.154$, $p < 0.01$). The results indicate that better performing firm could reduce the IPO's cost of capital of the issuer. As the firm performance is better, it presents a better image and reduces the uncertainties of the future of IPO firm, and thus, reducing the risk associated with the IPO shares.

In essence, firm performance has a direct impact on both the IC disclosure and the level of underpricing. However, IC disclosure does not mediate the relationship between firm performance and the level of underpricing as the significant value for bootstrapping confidence interval for mediation is 0.162 which is higher than 0.05.

4.4.5 Relationship among industry sector, disclosure and level of underpricing. The standardized regression weight results for the impact of the technology sector with the extent of disclosure indicate a moderately significant negative results ($\beta = -0.112$, $p < 0.10$). This result is consistent with the studies of Azwan *et al.* (2012), Saenz and

Gomez (2008) and Striukova *et al.* (2008), who found negative association between the intangible intensive sectors and the extent of disclosure, for companies in Malaysia, Spain and UK, respectively. The researchers argued that the retail sector may need to disclose more information in both categories, namely, internal structure (e.g. distribution channels) and external structure (e.g. customers' relationship) as the firms in these sectors have to initiate an effective distribution channel to cultivate and serve customers in order to be at a competitive advantage. This argument is further substantiated by Foong *et al.* (2009) who also demonstrated that the top industry sector that provided higher disclosure of IC information in the 2003 annual reports of the Malaysian public listed companies was companies under the "trading and service" sector. In other words, the current study agrees with some studies in Malaysia and overseas for the influence of the nature of industry and the extent of disclosure.

However, no significant relationship could be observed for the impact of technology sector on the level of underpricing, indicates that technology sector is not relevant in reducing the level of underpricing. In addition, the significant value for bootstrapping confidence interval for mediation is 0.129 ($>$ 0.05) suggests that there is no mediation effect for industry sector and underpricing, through disclosure.

4.4.6 Relationship among firm's level of foreign activity, disclosure and level of underpricing. The level of foreign activity is found to be significant in driving for higher disclosure of IC information, with the standardized regression weight, $\beta = 0.293$ ($p < 0.001$). Firms that are involved in the international dealings have the incentive to disclose more information, due to the complexity of their operations and to meet the stakeholders' needs both domestically and internationally.

The standardized regression weight results for the association between the firm's level of foreign activity and the level of underpricing indicates a significant negative results ($\beta = -0.125$, $p < 0.05$). The results indicate that firms with higher level of foreign activity could reduce the IPO's cost of capital of the issuers. As the firm diversifies the risk through its foreign activities, it sends signals about its globalization status and could reduce the uncertainties of the future of the firms, and thus, reducing the risk associated with the IPO shares.

In essence, the firm's level of foreign activity has direct impact on both the disclosure and the level of underpricing. However, disclosure does not mediate the relationship between the firm's level of foreign activity and the level of underpricing as the significant value for bootstrapping confidence interval for mediation is 0.201 which is higher than 0.05.

5. Implications

This study provides significant implications in a number of ways. First, since current study demonstrates that the extent of disclosure is lower for firms that are classified under the technology sector, potential investors may require a higher discount on the share price for firms that are with higher technological innovative efforts. As contended by Lev and Zarowin (1999) that a report with IC information has been considered as having more value relevance in the firm with development in progress for innovative products. Therefore, it may be more costly for firms that are classified under the technology sector to seek listing than the companies under the other industry sectors. As such, the policy makers need to promote for higher IC disclosure in the corporate reports, specifically for the firms that are classified under the technology sector.

Second, the results of this study imply that the firm (i.e. performance and foreign activity) characteristics have some signaling effect toward the level of underpricing. Firms with better performance results or with higher overseas dealings send signal of better quality firms which associate with lower level of underpricing. In essence, a diversified and better performing firm could leave lesser money on the table, i.e., could bring the IPO firms to public at a lower cost.

As the main objective of the Economic Transformation Program of Malaysia is to turn the country into a high-income economy by year 2020, both public and private sectors play important roles in realizing this objective. Contribution of the private sectors is extremely important as private investment can spearhead the growth of the country's gross national income. Therefore, the government may need to promote for higher private investment, specifically on IC elements, for the economic growth. In the present study, it has been observed that smaller or weaker firms seem to invest and provide more disclosure. Since IC investment and disclosure involve costs, and the resources of smaller or weaker firms are limited, the Malaysian government could support these firms, perhaps by providing more tax incentives for them.

6. Limitation and future research

The present study concerns the disclosure of IC information and its impact on the level of underpricing. It has been contended that higher disclosure on the firms' undertakings will reduce the uncertainties in the share valuation, and thus reducing the level of underpricing for the IPO issues. There are other types of disclosures in the IPO prospectuses that may be important in reducing the information asymmetry gap of the potential investors.

As such, future study can examine IC disclosure together with other disclosure items in the IPO prospectuses that could influence the level of underpricing. In other words, future study can determine if IC disclosure is complementary to other types of disclosure in reducing the information asymmetry gap of potential investors in the primary market.

In addition, a study of disclosure on IC elements in another medium of reporting for other decision purposes, such as corporate bond issuance, in which the target users are the potential bondholder (i.e. creditor) of the company, could provide a new path for research activity. The argument for the difference of IC disclosure strategy in different medium of reporting that is attributable to different investment purpose is based on the notion that requirement of IC information by different users may be different for relevant decision-making purpose.

7. Concluding remarks

This study which examines the disclosure strategy of IC information in the IPO prospectuses contributes to the current limited literature on IPO issue as argued that most studies focus on such disclosure in the annual reports (Azwan *et al.*, 2012; Bukh *et al.*, 2005; Chang *et al.*, 2009; Cordazzo, 2007; Guo *et al.*, 2004; Singh and Van der Zahn, 2007; Whiting and Miller, 2008). In particularly, this study provides further literature on the disclosure of IC information in the IPO prospectus when most of the IC disclosure studies in Malaysia relate to the disclosures in the annual report (e.g. Abdifatah and Nazli Anum, 2012; Foong *et al.*, 2009; Goh and Lim, 2004; Ousama *et al.*, 2011; Siti Mariana and Mariana, 2011). In essence, this study which focusses on the IC disclosure in the IPO prospectuses provides some insights into the IC investment and disclosure strategy for IPO firms, of which is limited in the Malaysian context.

Apart from the above literature contribution, our study differs from the prior literature in a number of ways. First, most of the studies examining IC disclosure in the IPO prospectus focussed on the determinants of disclosure (e.g. Azwan *et al.*, 2012; Bukh *et al.*, 2005; Cordazzo, 2007; Rimmel *et al.*, 2009; Singh and Van der Zahn, 2008). Present study includes both determinants and value relevance of IC disclosure in the Malaysian IPO issues which extends from study of Azwan *et al.* in the Malaysian IPO context. So far, the value relevant property of IC disclosure in influencing the level of underpricing was performed in the Singaporean IPO issues (Singh and Van der Zahn, 2007). However, the findings from a developed nation (i.e. Singapore) cannot be generalized to an emerging nation such as Malaysia. Second, this study considered issues beyond those that the existing IC disclosure literature studies have examined. While there has been literature on the determinants of IC disclosure in the Malaysian context, the present study extends its investigation on the direct and mediating impact of such disclosure on the cost of going public for IPO firms. Current findings add to a growing body of literature on whether the IC disclosure could play a role as a mediator for the impact on the level of underpricing and this result is significant to strategy decision making of the IPO firms as well as the accounting standard regulators in the Malaysian environment.

This study provides a comprehensive investigation of the direct and indirect influence of IC disclosure on the level of underpricing of the Malaysian IPO issues. Our examination is based on data collected from 331 Malaysian IPOs from 2002 to 2008. The results of this study show that IC disclosure is not significant enough to reduce the information gap between the firms and its potential investors, and thus does not affect the underpricing gap. In other words, IC information is not able to reduce the cost of capital of going public. A possible reason for such insignificant result could be that the extent of IC disclosure is too low to have any significant impact in reducing the underpricing gap. Since the IC investment and disclosure assumes additional costs, the investment and subsequent disclosure is considered minimal. In addition, the extent of IC disclosure does not mediate the relationship between some firms' characteristics and the level of underpricing. In fact, underpricing is directly affected by firm's performance and firm's level of foreign activity. Since the extent of IC disclosure is low and insufficient in reducing the level of underpricing, the Malaysian policy maker may need to promote for higher disclosure to enhance the valuation efficiency of IPO shares in the capital market.

In addition, the results on the impact of the firm's size, firm's performance and the firm's level of foreign activity on the extent of IC disclosures provide support for the Legitimacy Theory which stipulates that the reason for the driving force of disclosure is to gain better reputation for IPO firms so that their shares are not undervalued.

In essence, disclosure of relevant information, especially on IC, is pertinent for decision making. This study provides a new insight for the examination of the mediator role of IC disclosure on the impact of the level of underpricing. In addition, recommendations on practical issues are provided for the benefit of the managers, investors and policy makers.

Prior researches mainly focussed on the extent and usefulness of IC disclosure in the secondary market, in which annual reports were mostly being analyzed. As opposed to the prior researches, current research provides another dimension of reviewing the extent and value relevance of IC information in the primary market, in which IPO prospectuses are being analyzed for the IC disclosure strategy. The comparison of current vs prior research findings has shown that the category of disclosure concentration is different on different mediums of reporting. Therefore, this study, to a certain extent, provides a new path for future continuous study on IC in the IPO prospectuses.

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