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THE EFFECT OF UNDERINVESTMENT ON THE RELATIONSHIP BETWEEN EARNINGS MANAGEMENT AND INFORMATION ASYMMETRY

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ABSTRACT

Earnings management is often investigated from the opportunistic perspective and rarely from the informational perspective. This study investigates earnings management from the informational perspective by incorporating underinvestment as a moderating variable in the relationship between earnings management and information asymmetry. A panel data regression analysis on firms listed on the Main Board of Bursa Malaysia reveals that earnings management reduces information asymmetry. We also provide evidence that underinvestment moderates the relationship between earnings management and information asymmetry. This finding suggests that earnings management among underinvesting firms reduces information asymmetry. Therefore, underinvestment motivates managers to convey informational earnings management.

Keywords: informational earnings management, opportunistic earnings management, information asymmetry, underinvestment, Malaysia

INTRODUCTION

Accounting research has focused on earnings management, which has been classified into two perspectives: opportunistic and informational (Jiraporn, Miller, Yoon, & Kim, 2008). The opportunistic perspective explains earnings management as a harmful financial manipulation that benefits managers (Desai, Rajgopal, & Venkatachalam, 2004). On the other hand, the informational perspective defines earnings management as a means for disclosing and enhancing the quality of accounting information, thereby leading to a better view of firm performance (Arya, Glover, & Sunder, 2003). In the end, earnings management benefits users in decision making.

Earnings management has been largely investigated from the

opportunistic perspective. Previous studies have examined the conditions motivating managers to apply this perspective, such as (a) increasing their bonuses (Guidry, Leone, & Rock, 1999), (b) increasing stock prices during initial public offerings (Rangan, 1998; Teoh, Wong, & Rao, 1998), and (c) decreasing earnings during the threat of investigation for monopolistic practices (Cahan, 1992).

In contrast, limited studies (Gul, Leung, & Srinidhi, 2003; Jiraporn et al., 2008) investigated earnings management from the informational perspective. This research gap leads to the perpetual perception of earnings management related to financial manipulation, which is harmful to users of accounting information. In comparison, generally accepted accounting principles provide managers flexibility in selecting accounting methods, allowing them the discretion over earnings to communicate private information to the public. As such, earnings management may not always be harmful to users (Fields, Lys, & Vincent, 2001; Jiraporn et al., 2008).

Our study contributes to the limited research on earnings management from the informational perspective and incorporates the underinvestment motivating factor (the incentive). We believe that underinvestment is a condition that motivates managers to convey informational earnings management (Fields et al., 2001) and hence reduces information asymmetry.

Firms experience underinvestment when they cannot finance profitable projects due to liquidity constraints (Harford, 1999). Despite high-growth opportunities, firms cannot generate financial support from external sources due to information asymmetry (Driffield & Pal, 2001; Stein, 2003). These views are consistent with Myers and Majluf (1984), Sheu and Lee (2012), Flor and Hirth (2013) and Poulsen (2013). Therefore, to reduce information asymmetry, underinvestment firms must provide high-quality accounting information (Diamond & Verrecchia, 1991; Kim & Verrecchia, 1994). One way to accomplish this is by conveying informational earnings management.

In the present study, we provide evidence of the above scenario. Similarly, we contribute to the accounting (earnings management) and finance (underinvestment) literature by providing additional conditions for informational earnings management to occur within the Malaysian context. Generally, we provide a theoretical link from finance to accounting. This study is motivated by the fact that Malaysian firms have the characteristics of firms facing underinvestment (Abdul Rahim, Yaacob, Alias, & Mat Nor, 2010). The firms are, in general, financially constrained (Driffield & Pal, 2001; Ismail, Ibrahim, Yusoff, & Zainal, 2010) and tend to rely on external financing (Driffield & Pal, 2001). Thus, consistent with prior research, we predict that these firms are

motivated to reduce information asymmetry by conveying informational earnings management to obtain financial support with favorable terms from external sources (Diamond & Verrecchia, 1991; Kim & Verrecchia, 1994).

Furthermore, Malaysian data provide a good setting for investigating information asymmetry issues where the legal system and the capital market is well developed (Mohamad, Hassan, & Ariff, 2007) but where the information environment is poor (Ball, Robin, & Wu, 2003). In an environment in which information is rich, such as in developed countries, we can expect that information asymmetry between management and investors would be minimised. In such an environment, public disclosure (either using the formal channel of annual reports or other channels) plays its role as a medium through which management signals private information to stakeholders, including investors. Thus, the signaling of information through earnings management by firms may not greatly impact investors' decisions because they can depend on other information provided in the annual report or on other formal or informal information channels in the market. Thus, we may not see clearly how underinvestment affects the relationship between earnings management and information asymmetry. In other words, when there is an underinvestment problem, management may signal the market using earnings management practices to reduce information asymmetry. As argued earlier, this effect can be seen more clearly when the information environment is not rich, such as in Malaysia. In addition, Bhattacharya, Daouk and Welker (2003) find that earnings aggressiveness is high in Malaysia. This finding could be due to both opportunistic earnings management aiming to influence market actors to behave in certain ways and/or it could be the result of informational earnings management that is not harmful to the market. We believe, based on theory and the prior literature, that the latter incentive would dominate in an underinvestment setting. Therefore, we believe that our study will provide evidence from a new perspective on the effect of underinvestment on the relationship between earnings management and information asymmetry within this unique setting.

Our results indicate that earnings management is negatively related to information asymmetry, indicating that earnings management reduces information asymmetry. The negative relationship between earnings management and information asymmetry is also stronger for underinvestment firms than it is for non-underinvestment firms. This finding indicates that underinvestment is a condition that motivates managers to convey informational earnings management.

The rest of this paper is organised as follows. The next section reviews related literature and sets up the hypotheses. Followed by another section that describes

the current research methodology. The next section presents the empirical findings. The last section summarises and concludes the paper.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Earnings Management and Signaling Theory

The signaling theory proposed by Akerlof (1970) discusses information asymmetry issues among the parties involved in a business transaction that lead to adverse selection.[1] As a means of prevention, a firm can signal its positive aspect of information (Akerlof, 1970). This concept is supported by Spence (1973), who defines signaling as an activity in which individuals attempt to change beliefs or provide information to others. Thus, the signal is expected to reduce information asymmetry.

A signal must possess two characteristics to become influential (Kirmani & Rao, 2000). First, the signal should reduce information asymmetry among those involved in the contract. Second, the signal should describe the information. Erdem and Swait (1998) argue that the signal must be (a) transparent to both provider and users and (b) credible in the sense that a wrong or incorrect signal adversely affects the provider. Furthermore, Spence (1973, 1976) suggests that to be a good signal, the information should possess three characteristics: (1) the firm has an incentive to convey the signal; (2) the signal can be manipulated by (within the control of) the firm, and (3) the signal cost is negatively related to the signal for high-quality firms compared to low-quality firms.

Earnings management can be considered a signal because it has the three features suggested by Spence (1973, 1976). First, firms possess the incentive to use earnings management to convey internal firm information to users (Arya et al., 2003). Thus, informational earnings management influences the confidence level of investors regarding firm performance. For instance, Subramanyam (1996) finds a positive relationship between discretionary accruals (*DACC*) and stock returns, indicating that *DACC* (proxy for earnings management) is one of the ways to gain confidence among investors and produce stock price increases. These increases can serve as incentives for a manager to apply earnings management because it can increase his or her bonus (Guidry et al., 1999). In addition, informational earnings management reduces information asymmetry (Bartov & Bodnar, 1996) and capital costs (Francis, LaFond, Olsson, & Schipper, 2005).

Second, managers may apply earnings management to manipulate accounting numbers and therefore report better profit. In accounting, total

accruals (*TACC*) comprises both nondiscretionary and discretionary accruals, with the latter (as a proxy for earnings management) mostly involving a manager's valuation of the future performance of the firm. For example, managers may use their discretion to determine (a) the useful life of assets for depreciation purposes, (b) the depreciation method, and (c) the percentage of contingency debts. Therefore, earnings management can be manipulated by (within the control of) managers using their discretion.

The third characteristic is that signals and their costs are negatively correlated for high-quality firms compared to low-quality firms. This feature can hinder low-quality firms from imitating high-quality firms. In this context, earnings management is the signal to which the investor's reaction is the signal cost. A high-quality firm may convey its private information to market participants to indicate its good performance, possibly through informational earnings management (Arya et al., 2003). Thus, the market will react positively, which is reflected by stock price increases. In contrast, earnings management by low-quality firms may be perceived as an opportunistic behavior to mislead users, causing a negative reaction and a decrease in the stock price (Gul et al., 2003). Thus, low-quality firms suffer high costs in using earnings management as a signal. This negative correlation between the signal and its cost in high-quality firms compared with low-quality firms shows that the relationship between earnings management and stock price is positive for high-quality firms but negative for low-quality firms.

Earnings management therefore possesses all of the characteristics of a signal and can be used to convince investors about firm quality. In this case, managers from high-quality firms apply informational earnings management to differentiate themselves from low-quality firms (Morris, 1987). In such a situation, signaling theory predicts that earnings management will add to the content and quality of accounting information.

Earnings Management and Information Asymmetry

Information asymmetry is important in accounting because it allows for the investigation of decision usefulness in accounting information. Diamond and Verrecchia (1991) and Kim and Verrecchia (1994) indicate that the disclosure of high-quality accounting information can reduce information asymmetry between firms and stakeholders. Earnings management has been reported to reduce the quality of accounting information (Beneish & Vargus, 2002; Chan, Chan, Jegadeesh, & Lakonishok, 2006; Francis et al., 2005, 2007), thus increasing information asymmetry. Wasan (2006) supports this concept by finding a positive correlation between earnings management and information asymmetry.

In contrast, the informational perspective on earnings management is believed to be useful to accounting information users (Arya et al., 2003). Chaney, Jeter and Lewis (1998) and Hunt (1985) indicate that one form of earnings management – income smoothing – can increase the predictability of firm performance by reducing variability and increasing earnings persistence. Similarly, Subramanyam (1996) finds that income smoothing allows managers to convey private information about real firm performance in the future, implying that earnings management can reduce information asymmetry. Recent research by Jiraporn et al. (2008) indicates that earnings management is useful for firms because it has a negative correlation with agency cost and a positive correlation with firm value.

Signaling and agency theories can explain the relationship between earnings management and information asymmetry. However, the predictions of these theories differ. Signaling theory posits that a firm should convey quality information as a signal of its prominence (Spence, 1973). This quality information will decrease asymmetry (Lang & Lundholm, 1996; Welker, 1995) and capital costs (Francis et al., 2005) and increase liquidity (Frankel, McNichols, & Wilson, 1995). In other words, *DACC* (proxy of earnings management) can signal private firm information (Arya et al., 2003; Jiraporn et al., 2008). Earnings management can add to accounting information and provide a better description of firm performance (Arya et al., 2003). Thus, signaling theory predicts that earnings management will reduce information asymmetry (Bartov & Bodnar, 1996).

However, agency theory predicts that opportunistic behaviour causes earnings management that, in turn, increases information asymmetry. The objectives of a manager are not always in line with those of an investor. Knowing more about the possible future performance of the firm, the manager has the opportunity to manage earnings opportunistically for his or her benefit. A few examples of such manipulation are the maximisation of bonuses (Abarbanell & Lehavy, 2003), meeting analyst demands (Abarbanell & Lehavy, 2003; Burgstahler & Eames, 2003), and avoiding debt covenant violations (Jaggi & Lee, 2002; Mohd-Saleh & Ahmed, 2005). Previous studies report that opportunistic earnings management will reduce the quality of earnings (Beneish & Vargus, 2002; Chan et al., 2006), causing greater information asymmetry (Easley & O'Hara, 2004). Therefore, based on the agency theory, earnings management will increase information asymmetry.

The above discussion shows the difficulty of firmly predicting the direction of the relationship between earnings management and information asymmetry. However, in Asian countries, including Malaysia, prior studies found that earnings management tends to be accepted as a mechanism for saving the

economic condition of firms (Ahmad-Zaluki, Campbell, & Goodacre, 2011; Ahmed, Godfrey, & Mohd-Saleh, 2008; Leuz, Nanda, & Wysocki, 2003; Mohd-Saleh & Ahmed, 2005; Choi, Kim, & Lee, 2011). Similar results were reported in an Indonesian study by Siregar and Utama (2008). The study shows that earnings management (which was proxied by discretionary accrual) is informative because it is positively related to future profitability. Hence, it is expected that there will be a tendency of earnings management to reduce information asymmetry. Based on the theories and research discussed above, we hypothesise the following:

H1: Earnings management has a negative effect on information asymmetry.

Underinvestment and Informational Earnings Management

In a perfect stock market, managers can easily obtain external funding to finance investment projects with positive net present value due to the availability of complete information (Modigliani & Miller, 1958), which allows the firm to incur an appropriate capital cost. However, such perfection is not always possible because of information asymmetry between the firm and the investor (Stein, 2003), as well as the agency problem (Ismail et al., 2010). Unable to predict the true risks of investing in firms, external investors may impose a higher capital cost (Myers & Majluf, 1984), which is known as liquidity constraint (Harford, 1999). Therefore, the firm's only other option is to use internal financing (cash flow) for its investments. However, firms with cash flow difficulties will be forced to forgo profitable investment projects. This underinvestment condition (Harford, 1999) shows the increased sensitivity between cash flow and investment of the liquidity-constrained firm (Hubbard, 1998).

Fazzari, Hubbard and Petersen (1988) investigate the relationship between internal cash flow and investment, stating that information asymmetry will cause potential investors to request higher capital costs. Firm dependency on internal cash flow increases its sensitivity to the investment. Fazzari et al. (1988) divide their sample into three groups based on the dividend payment ratio (as a proxy of the liquidity constraint). A reduced dividend payment ratio increases the liquidity constraint, which, in turn, strengthens the positive relationship between internal cash flow and investment. Thus, sensitivity between internal cash flow and investment is caused by the liquidity constraint in which a firm experiences a higher capital cost on external funding compared with that of internal funding. This positive relationship was supported by subsequent studies, such as those by Gilchrist and Himmelberg (1995) and Hadlock (1998).

While the above studies focused on developed countries, few studies on Malaysian firms have been conducted. A recent study by Ismail et al. (2010) indicates that financial constraint is present in the Malaysian market. The

researchers' findings are consistent with those of Driffield and Pal (2001), which indicate that 67% of Malaysian firms are financially constrained. The constraint may affect investment activities among Malaysian firms due to what was reported in the U.S. (Hsiao & Tahmiscioglu, 1997) and Canada (Schaller, 1993) if they fail to secure financial assistance. However, Driffield and Pal (2001) indicate that the majority of Malaysian firms finance their investment externally, although doing so is more expensive for small firms (43%). Information asymmetry may cause small firms to underinvest (Abdul Rahim et al., 2010).

Underinvestment results in inefficient investment. Biddle and Hilary (2006) examine the influence of quality accounting information on investment efficiency. Such quality is measured through earning aggressiveness, loss avoidance, earning smoothing, and timeliness. Investment efficiency is measured by the sensitivity between internal cash flow and investment. Higher sensitivity causes higher inefficiency in company investment activities because the sensitivity shows the liquidity constraint (Fazzari et al., 1988; Kaplan & Zingales, 1997). Biddle and Hilary (2006) find that higher accounting information quality may lower the sensitivity of internal cash flow, thus contributing to investment efficiency and reducing information asymmetry. Furthermore, Biddle, Hilary and Verdi (2009) investigate whether accounting information quality positively affects investment efficiency due to a decrease in underinvestment. High accounting information quality is shown to increase investment efficiency for underinvesting firms.

Previous studies likewise prove that underinvestment firms have high growth opportunities. Morgado and Pindado (2003) report the quadratic relationship between company value and investment, concluding that underinvesting firms have more room for growth due to the many profitable investment opportunities available before their optimum level is achieved. Because underinvesting firms suffer from liquidity constraints but have high growth opportunities, we predict that they will be motivated to disclose high-quality accounting information. Higher-quality accounting information increases information availability in the market (Lang & Lundholm, 1996), reduces information asymmetry (Biddle & Hilary, 2006), reduces the cost of capital (Francis et al., 2005; Embong, Mohd-Saleh, & Hassan, 2012), and increases liquidity (Diamond & Verrecchia, 1991). Therefore, we predict that underinvesting firms are motivated to apply informational earnings management to reduce information asymmetry, freeing themselves from underinvestment.[2] The second hypothesis is thus stated as follows:

> H2: The negative effect of earnings management on information asymmetry is stronger for underinvesting than non-underinvesting firms.

RESEARCH METHOD

Sample

The sample for this study includes firms listed on the Main Board of Bursa Malaysia between 2001 and 2007. Table 1 presents the total observations with complete data for 2163 firm-years. However, data that was obtained from the mining, hotel, and finance industries for 131 firm-years was excluded. Firms in the finance industry are excluded because they are subject to different and additional regulations (Embong et al., 2012) and because they are high cash flow firms but low investment firms (Agung, 2000; Ismail et al., 2010). We excluded firms in the mining and hotel industries because their numbers were small and likely would not have affected our analysis. In addition, the hotel and finance industries show different *DACC* behaviors compared to the majority of firms in other industries (Peasnell, Pope, & Young, 2000). We also exclude 112 firm-years with incomplete and extreme data from the analysis. Thus, excluding these firms may prevent our sample being affected by influential outliers (Ismail et al., 2010). Therefore, the final sample consists of 1920 firm-years.

Table 1
Sample of the study

Year	2001	2002	2003	2004	2005	2006	2007	Total
Firms which have complete data	290	318	305	308	311	311	320	2,163
Less:								
Firms in finance, hotel and mining industries	17	22	13	15	19	24	21	131
Firms which have outlier data	13	14	18	18	14	15	20	112
Total	260	282	274	275	278	272	279	1,920

Measurement

Earnings management

Earnings management reflects the ability of management to influence financial statements. As a proxy for earnings management, we use *DACC*s using a procedure suggested by Kothari, Leone and Wasley (2005) and determined through several steps. First, *TACC* is calculated using a cash flow approach, as shown in Equation 1.

$$TACC_{it} = EBX_{it} - OCF_{it} \quad (1)$$

where

$TACC_{it}$ = Total accruals for firm *i* at the end of year *t*.
EBX_{it} = Earnings before extra-ordinary items for firm *i* at the end of year *t*.
OCF_{it} = Operating cash flow for firm *i* at the end of year *t*.

Non-*DACC* (*NDACC*) is then determined by initially estimating α_1, α_2, α_3, and α_4 using the following regression equation (Equation 2):

$$TACC_{it}/TA_{it-1} = \alpha_1(1/TA_{it-1}) + \alpha_2((\Delta REV_{it} - \Delta REC_{it})/TA_{it-1}) + \alpha_3(PPE_{it}/TA_{it-1}) + \alpha_4 ROA_{it-1} + \varepsilon_{i,t} \quad (2)$$

where

$TACC_{it}$ = Total accruals for firm *i* at the end of year *t*.
$TA_{it\text{-}1}$ = Total assets for firm *i* at the end of year *t* –1.
ΔREV_{it} = The change in revenue for firm *i* between years *t* and *t* – 1.
ΔREC_{it} = The change in receivables for firm *i* between years *t* and *t* – 1.
PPE_{it} = Gross property, plant and equipment for firm *i* at the end of year *t*.
$ROA_{it\text{-}1}$ = Return on assets for firm *i* at the end of year *t* – 1.

NDACC is calculated based on Equation 3, in which we incorporate α_1, α_2, α_3, and α_4 from regression equation (Equation 2).

$$NDACC_{it} = \hat{\alpha}_1(1/TA_{it-1}) + \hat{\alpha}_2((\Delta REV_{it} - \Delta REC_{it})/TA_{it-1}) + \hat{\alpha}_3(PPE_{it}/TA_{it-1}) + \hat{\alpha}_4 ROA_{it-1} \quad (3)$$

where

$NDACC_{it}$ = Nondiscretionary accruals for firm *i* at the end of year *t*.
$TA_{it\text{-}1}$ = Total assets for firm *i* at the end of year *t* – 1.
ΔREV_{it} = The change in revenue for firm *i* between years *t* and *t* – 1.
ΔREC_{it} = The change in receivables for firm *i* between years *t* and *t* – 1.
PPE_{it} = Gross property, plant and equipment for firm *i* at the end of year *t*.
$ROA_{it\text{-}1}$ = Return on assets for firm *i* at the end of year *t* – 1.

Finally, we determine the *DACC* using Equation 4.

$$DACC_{it} = TACC_{it} - NDACC_{it} \quad (4)$$

where

$DACC_{it}$ = Discretionary accruals for firm *i* at the end of year *t*.
$TACC_{it}$ = Total accruals for firm *i* at the end of year *t*.
$NDACC_{it}$ = Nondiscretionary accruals for firm *i* at the end of year *t*.

The above measurement as a proxy for earnings management has been widely used for other studies on earnings management in Malaysia (Mohd-Saleh & Ahmed, 2005; Ahmed et al., 2008; Ahmad-Zaluki et al., 2011) and other Asian countries (Leuz et al., 2003; Choi et al., 2011).

Underinvestment

We use the dummy variable 1 to represent underinvesting firms and 0 otherwise. An underinvesting firm should possess two characteristics: (1) sensitivity to internal cash flow–investment (reflects the liquidity constraint) and (2) high growth opportunity. Prior to allocating the variables, two steps were taken. First, the cash flow–investment sensitivity for each firm was identified to separate firms with cash flow–investment sensitivity from firms without such sensitivity. This separation was based on Equation 5, which was developed by Hovakimian and Hovakimian (2009) and used by Biddle and Hilary (2006).

$$CFIS = \sum_{t=1}^{n} \left(\frac{I_{it} \times CF_{it}}{\sum_{t=1}^{n} CF_{it}} \right) - \frac{1}{n} \sum_{t=1}^{n} I_{it} \quad (5)$$

where *CFIS* is cash flow–investment sensitivity, *n* is the total observation year for firm *i*, *t* is the observation period, *CF* is cash flow and *I* is investment. The *CFIS* value should be higher for firms that tend to invest more in years with relatively high cash flows and less in years with relatively low cash flows (Biddle & Hilary, 2006). Firms with an *CFIS* that is higher (lower) than the average *CFIS* in the sample are classified as having (does not have) *CFIS*.

Second, we determine growth opportunity, which is measured based on the market-to-book value ratio. A higher ratio predicts high growth opportunities for firms (Holthausen & Larcker, 1992; Skinner, 1993). Finally, we determine the

firms that can be included in the underinvestment category. These firms should have both high *CFIS* and growth opportunity. In other words, firms will be categorised as underinvesting if their values of *CFIS* (in the first-step calculation) and market-to-book value ratio (in the second step calculation) are higher than the sample mean.

Information asymmetry

Information asymmetry is measured based on the *bid–ask spread*, which is the difference between the stock price demanded by the buyer (*bid price*) and the stock price offered by the seller (*ask price*) (Leuz & Verrecchia, 2000). Bid and ask prices are determined by the stock dealer as market maker and vary from one firm to another depending on the level of information asymmetry between informed and uninformed investors (Callahan, Lee, & Yohn, 1997).

The bid–ask spread comprises three components: order processing cost, inventory-holding cost, and adverse selection cost (Callahan et al., 1997). Order processing cost is the cost spent by the dealer to settle clearing transactions. Inventory-holding cost is the cost spent by the dealer to hold a number of shares to fulfill investor demand. Adverse selection cost (also known as information asymmetry cost) is the cost requested by dealers because they bear the risk when involved in transactions with informed investors. In other words, adverse selection cost appears due to the presence of information risk (Callahan et al., 1997).

The bid–ask spread is used as a proxy for information asymmetry because dealers interact with two types of investors: those who need liquidity (liquidity traders) and those with information (informed traders). Dealers predict profit gain from transactions with investors who need liquidity but predict financial loss due to transactions with informed investors who only transact if they can gain profit. As such, dealers create spreads between bid and ask prices to maximise the difference between profit (from transactions with liquidity traders) and loss (from transactions with informed investors). When dealers feel that the risk of information asymmetry is high (transactions with informed investors are increasing), they will widen the adverse selection cost, thus increasing the bid–ask spread (Callahan et al., 1997).

Consistent with previous studies, the bid–ask spread is measured based on the difference between the closing bid and the ask price divided by the average of the closing bid and the ask price. The bid–ask spread is calculated as follows:

$$BidAskSpread_{it} = \frac{AskPrice - BidPrice}{[(AskPrice + BidPrice)/2]} \quad (6)$$

The calculation of the bid–ask spread is performed with a period that begins from the seventh day after the date of financial statements end of year *t* to seven days before 30 March of year *t +1*. This period is selected because our sample consists of firms having year-end only at 31 December.

We use the bid–ask spread to measure information asymmetry for several reasons.[3] First, the bid-ask spread is the difference between the highest price of a stock the buyer is willing to pay (bid price) and the lowest price acceptable to the seller (ask price). This difference provides compensation to the market maker who takes the risk of trading in the market and ensuring market liquidity. In general, the more liquid a stock is, the smaller the differential bid and ask prices. This price differential is used as a proxy of information asymmetry because the non-equality in the information possessed by buyers and sellers causes the bid and the ask prices to differ.

Second, the bid–ask spread reflects an information problem that results from transactions between informed investors with dealers and uninformed investors. In other words, the bid–ask spread contains a risk of information asymmetry, which is faced by dealers and uninformed investors when they transact with informed investors. Leuz and Verrecchia (2000) argue that the bid–ask spread will increase as the perceived risk by dealers and investors increases. Third, the bid–ask spread has been used in previous studies (Kim & Verrecchia, 1994; Leuz & Verrecchia, 2000; Richardson, 2000), particularly those using Asian markets data, including Japanese data (Guo, Zhou, & Cai, 2008) and China (Zhou, 2007).

Model

Hypothesis 1 (H1) examines whether earnings management has a relationship to information asymmetry. We examine H1 based on the following regression:

$$IA_{it} = c_0 + c_1 EM_{it} + \varepsilon_{it} \quad (7)$$

where

IA_{it} = Information asymmetry for firm *i* at year *t*.
EM_{it} = Earnings management, proxied by discretionary accruals for firm *i* at the end of year *t*.
ε_{it} = Error term.

The coefficient of c_1 indicates the relationship between earnings management and information asymmetry. H1 is supported if c_1 is significant.

Hypothesis 2 (H2) examines whether earnings management has a stronger negative relationship to information asymmetry for underinvesting than for non-underinvesting firms. This examination explains the role of underinvestment in the relationship between earnings management and information asymmetry. H2 is examined using Equation 8.

$$IA_{it} = h_0 + h_1 EM_{it} + h_2 UI_{it} + h_3 EM_{it} X\, UI_{it} + \varepsilon_{it} \quad (8)$$

where

IA_{it} = Information asymmetry for firm i at year t.
EM_{it} = Earnings management, proxied by discretionary accruals for firm i at the end of year t.
UI_{it} = Underinvestment for firm i at year t (1= Underinvestment; 0 = Non Underinvestment).
$EM_{it}xUI_{it}$ = Interaction between earnings management and underinvestment.
ε_{it} = Error term.

The coefficient of h_1 shows the relationship between earnings management and information asymmetry for non-underinvesting firms. The coefficient of h_3 shows the relationship between earnings management and information asymmetry for underinvesting firms. H2 is supported if h_3 is negatively significant when $h_3 < h_1$.

RESULTS

Descriptive Results

Table 2 presents a sample of the underinvestment and non-underinvestment firms. There are 143 firms categorised as underinvesting and 1777 firms categorised as non-underinvesting. Out of 143 underinvesting firms, 19 firms are reported as having underinvested in 2001, 29 firms in 2002, 18 firms in 2003, 23 firms in 2004, 21 firms in 2005, 12 firms in 2006 and 21 firms in 2007. Table 2 reports that 241 firms are categorised as non-underinvesting in 2001, 253 firms in 2002, 256 firms in 2003, 252 firms in 2004, 257 firms in 2005, 260 firms in 2006, and 258 firms in 2007. These figures indicate that the sample is not balanced between both forms of companies, as underinvesting firms represent only 7% of the sample.

Table 2
Sample of underinvestment and non-underinvestment firms

	Year							Total
	2001	2002	2003	2004	2005	2006	2007	
Underinvestment firms	19	29	18	23	21	12	21	143
Non-Underinvestment firms	241	253	256	252	257	260	258	1,777
Total	260	282	274	275	278	272	279	1,920

Descriptive Statistics

Table 3 provides descriptive statistics for the total sample of 1920 firms. Panel A of Table 3 indicates that the mean for information asymmetry is 0.024 with a standard deviation of 0.017. The minimum and maximum value of information asymmetry is 0.002 and 0.061, respectively. The mean of earnings management is positive (0.031), indicating that, as a whole, sample firms tend to increase earnings through earnings management. Standard deviation for earnings management is 0.266, while the minimum and maximum values are 0.820 and 0.853, respectively.

Panels B and C of Table 3 present the descriptive statistics for the sample based on underinvesting and non-underinvesting firms, respectively. The mean of information asymmetry for underinvesting firms (0.033) is higher than for non-underinvesting firms (0.023), indicating that underinvesting firms face higher information asymmetry than non-underinvesting firms. Earnings management for underinvesting firms has a mean of 0.010, which is lower than the mean for non-underinvesting firms (0.033). The comparison of panels B and C reveals that underinvesting firms tend to have lower earnings management but experience higher information asymmetry. However, non-underinvesting firms tend to have higher earnings management but lower information asymmetry. The tendency of underinvesting (non-underinvesting) firms to have lower (higher) earnings management but higher (lower) information asymmetry shows that earnings management has information content. The higher the *DACC*s is, the lower information asymmetry will be.

Table 4 presents the results of the multicollinearity test measured by the value of tolerance and variance inflation factor (VIF). According to Kutner, Nachtsheim, Neter and Li (2005), a tolerance value lower than 0.1 and a VIF higher than 10 indicate multicollinearity. Table 4 indicates no multicollinearity within the independent variables.

Table 3
Descriptive statistics

Panel A: All sample (n = 1,920)				
	Mean	Standard Deviation	Minimum	Maximum
IA	0.024	0.017	0.002	0.061
EM	0.031	0.266	–0.820	0.853
UI			0	1
Panel B: Underinvestment firms (n =143)				
IA	0.033	0.022	0.003	0.061
EM	0.010	0.286	–0.789	0.772
Panel C: Non underinvestment firms (n =1,777)				
IA	0.023	0.017	0.002	0.061
EM	0.033	0.265	–0.820	0.853

Notes: *IA* = Information asymmetry; *EM* = Earnings management, *UI* = Underinvestment

Table 4
Multicollinearity test

(n = 1,920)	Tolerance	VIF
EM	0.937	1.067
UI	0.936	1.066
EM X UI	0.930	1.076

Notes: *EM* = Earnings management; *UI* = Underinvestment (1 = underinvestment; 0 = non-underinvestment); *EM X UI* = Interactions between *EM* and *UI*.

Results of Regression Analyses

Does earnings management affect information asymmetry? (H1)

This study employs panel data analysis techniques for all hypotheses.[4] H1 tests the relationship between earnings management and information asymmetry. Table 5 presents the results of the regression analysis for H1. We examine H1 based on the random effect approach because the p value of the Hausman test is not significant (chi squared = 0.915, p = 0.339) (Gujarati, 2003).[5] The focus of this test is the coefficient of c_1, which shows the relationship between earnings management and information asymmetry. The coefficient of earnings management (column 3) is negative and significant (c_1 = –0.005; p < 0.01), indicating that earnings management has a negative relationship with information asymmetry. The higher the earnings management is, the lower information asymmetry will be. Therefore, H1 (i.e., earnings management is associated with information asymmetry) is supported. This result indicates that firms use earnings

management to convey quality information (Spence, 1973) and signal private information (Arya et al., 2003; Jiraporn et al., 2008).

Table 5
The regression result for H1

$IA_{it} = c_0 + c_1 EM_{it} + \varepsilon_{it}$

Coefficient	Fixed effect *(n = 1,920)*	Random effect *(n =1,920)*
c_1	–0.004	–0.005
	(–2.917) ***	(*–3.290*)***
Adj. R^2	0.213	0.005
F statistics	2.890	9.934
p-value	*0.000*	*0.002*
Hausman test		
Chi square	0.915	
p-value	*0.339*	

Notes:*** Significant at $p < 0.01$ (two-tailed); *IA* = Information asymmetry; *EM* = Earnings management.

The role of underinvestment in the relationship between earnings management and information asymmetry (H2)

The purpose of H2 is to investigate the role of underinvestment in the relationship between earnings management and information asymmetry. Underinvesting firms are said to face asymmetric information, which causes a constraint in liquidity. At the same time, *DACC*s (proxy for earnings management) can be used to convey private information about firm performance. We predict that underinvesting firms are motivated to convey informational earnings management to decrease information asymmetry.

Table 6 presents regression results for H2. The Hausman test indicates that the chi squared value of 2.516 is not significant ($p = 0.472$). The random effect is, therefore, more appropriate than the fixed effect (Gujarati, 2003). The focus of the test is h_3 because it represents the coefficient of interaction between earnings management and underinvestment. The coefficient of h_3 shows the relationship between earnings management and information asymmetry only for underinvesting firms. Meanwhile, the coefficient of h_1 reflects the relationship between earnings management and information asymmetry only for non-underinvesting firms while h_2 shows the relationship between underinvestment and information asymmetry.

Column 3 in Table 6 indicates that the coefficient of earnings management is negative and significant ($h_1 = -0.003$, $p < 0.05$). This result shows that earnings

management has a negative relationship with information asymmetry. In other words, earnings management reduces information asymmetry. Table 6 also indicates that the coefficient of underinvestment is positive and significantly (h_2 = 0.009, p < 0.01) related with information asymmetry, indicating that underinvesting firms face the information asymmetry problem. The more firms experience underinvestment, the more they face information asymmetry. Table 6 presents the coefficient of interaction between earnings management and underinvestment. This result indicates that, for underinvesting firms, earnings management decreases information asymmetry (Brown, Stephen, & Lo, 2004; Welker, 1995). The negative impact of earnings management on information asymmetry is stronger for underinvesting firms than for non-underinvesting ones ($h_3 < h_1$). Thus, H2 is supported. This result indicates that underinvesting firms are motivated to provide high-quality information to free themselves from liquidity constraints and to reduce capital costs (Embong et al., 2012).

Table 6
Regression result for H2

$IA_{it} = h_0 + h_1EM_{it} + h_2UI_{it} + h_3EM_{it}xUI_{it} + \varepsilon_{it}$

Coefficient	Fixed effect *(n = 1,920)*	Random effect *(n = 1,920)*
h_1	–0.003	–0.003
	(*–1.832*)*	(*–2.132*)**
h_2	0.008	0.009
	(*4.427*)***	(*5.732*)***
h_3	–0.019	–0.018
	(*–4.439*)***	(*–4.429*)***
Adj. R^2	0.230	0.029
F-statistics	3.070	20.016
p-value	*0.000*	*0.000*
Hausman test		
Chi-square	2.516	
p-value	*0.472*	

Notes: *** Significant at p < 0.01 (two-tailed); ** Significant at p < 0.05 (two-tailed); *Significant at p < 0.10 (two-tailed). *IA* = Information asymmetry; *EM* = Earnings management; *UI* = Underinvestment (1 = underinvestment; 0 = non underinvestment); *EM* × *UI* = Interactions between *EM* and *UI*.

Endogeneity problem

Richardson (2000) indicates that high levels of information asymmetry may indicate insufficient resources and information among shareholders for monitor managers' actions, which may lead to earnings management practices. Therefore,

information asymmetry may provide firms with the incentive to manage earnings. Hence, we replace earnings management with lagged earnings management in Equations 7 and 8. The results show that the coefficient of lagged earnings management is negative (–0.041) and significant at $p < 0.10$. Furthermore, the coefficient of interaction between earnings management and underinvestment is also negative (–0.102) and significant at $p < 0.01$. Thus, the endogeneity problem is rejected, and we can conclude that earnings management is a determinant of information asymmetry.

Sensitivity Analysis

We believe size and leverage may affect the above analyses. Therefore, we include these variables to determine whether our results are sensitive to them. We include size because it shows future firm growth. Furthermore, size has a role in the choice between internal and external financing (Driffield & Pal, 2001). Size is also negatively related to information asymmetry because the track record of small and young firms is too short for stakeholders to judge (Guariglia, 2008). We measure size based on the natural logarithm of total assets at the end of the financial year.

We include leverage because it increases firm risk. Leverage increases the uncertainty of firm performance and information asymmetry (Boot & Thakor, 1993). Previous studies indicate that highly leveraged firms in some Asian countries must pay greater premiums on external financing (Agung, 2000; Driffield & Pal, 2001). This reduces funds for investment, which in turn reduces the ability of firms to secure external financing (Agung, 2000). This indicates the existence of financial constraint within these firms. Leverage is measured by the debt-to-equity ratio at the end of the financial year.

The results of the sensitivity analysis for H1 are presented in Table 7. Our analysis indicates that the Hausman test is not significant. Therefore, the random effect is more appropriate than the fixed effect (Gujarati, 2003). Column 3 in Table 7 indicates that the coefficient of *Log Size* is negative and significant ($c_2 = –0.005$, $p < 0.01$), whereas the coefficient of leverage is not significant. These findings indicate that information asymmetry decreases as firm size increases. Meanwhile, the coefficient of earnings management is negative and significant ($c_1 = –0.004$, $p < 0.01$), which is consistent with the result of H1 showing that earnings management reduces information asymmetry. Therefore, including control variables does not have any effect on the relationship between earnings management and information asymmetry.

A similar analysis is performed on H2. Table 8 presents the results of the sensitivity analysis for H2. In the table, the Hausman test shows that the p value

is not significant. Hence, the random effect is more suitable than the fixed effect (Gujarati, 2003). Column 3 in Table 8 indicates that the coefficient of Log Size is negative and significant (h4 = –0.006, p < 0.01), whereas the leverage is not significant, indicating that information asymmetry decreases for large firms. The interaction coefficient of earnings management and underinvestment is negative and significant (h3 = –0.017, p < 0.01). The results indicate that earnings management reduces information asymmetry for underinvesting firms. Column 3 in Table 8 indicates that the negative relationship between earnings management and information asymmetry is stronger for underinvesting firms than for non-underinvesting firms (h3 < h1). However, the relationship between earnings management and information asymmetry for non-underinvesting firms (h1) is not significant. This result is consistent with H2, which indicates that the negative relationship between earnings management and information asymmetry is stronger for underinvesting firms than for non-underinvesting firms. Consequently, the result of H2 is stable because control variables are included in the model.

Table 7
Sensitivity analysis to H1
$IA_{it} = c_0 + c_1EM_{it} + c_2LogSize_{it} + c_3LEV_{it} + \varepsilon_{it}$

Coefficient	Fixed effect *(n = 1,920)*	Random effect *(n = 1,920)*
c_1	–0.004 –*(*2.645)***	–0.004 (–2.902)***
c_2	–0.005 (–11.813)***	–0.005 (–15.739)***
c_3	–0.001 (–0.625)	–0.001 (–0.603)
Adj. R^2	0.274	0.118
F-statistics	3.613	86.971
p-value	*0.000*	*0.000*
Hausman test		
Chi-square	2.898	
p-value	0.408	

Notes: ***Significant at $p < 0.01$ (two-tailed). *IA* = Information asymmetry; *EM* = Earnings management; *LogSize* = Natural logarithm of total assets; *LEV* = Leverage, total debt divided by total equity.

To ensure our findings are credible, we examine the relationship between earnings management and the market value of firms' common equity. We use Ohlson's (1995) model to measure the value relevance of earnings management. We separate earnings into managed earnings (proxies by *DACC*) and unmanaged earnings (which consist of cash flow from operating and *non-DACC*). Our results

indicate that the coefficient of unmanaged earnings is positive (0.663) and significant at $p < 0.01$.[6] Furthermore, the coefficient of earnings management is also positive (0.526) at $p < 0.01$. Finally, our results indicate that the coefficient of book value is significant (0.218) at $p < 0.01$. The adjusted R^2 for the model is 0.595. These findings suggest that unmanaged earnings, managed earnings (i.e., earnings management) and book value are value-relevant. Therefore, we believe earnings management in Malaysia is informative. This is consistent with Siregar and Utama (2008), who found that earnings management is efficient among firms listed in the Jakarta Stock Exchange.

Table 8
Results of sensitivity analysis for H2

$IA_{it} = h_0 + h_1EM_{it} + h_2UI_{it} + h_3EM_{it}\,X\,UI_{it} + h_4LogSize_{it} + h_5LEV_{it} + \varepsilon_{it}$

Coefficient	Fixed effect *(n=1,920)*	Random effect *(n=1,920)*
h_1	–0.002 (*–1.520*)	–0.002 (*–1.642*)
h_2	0.014 (*8.322*) ***	0.016 (*10.744*)***
h_3	–0.018 (*–4.424*) ***	–0.017 (*–4.318*)***
h_4	–0.006 (*–13.832*) ***	–0.006 (*–18.434*)***
h_5	–0.001 (*–0.649*)	–0.001 (*–1.169*)
Adj. R^2	0.310	0.176
F-statistics	4.088	83.093
p-value	*0.000*	*0.000*
Hausman test		
Chi-square	3.300	
p-value	*0.654*	

Notes:*** Significant at $p < 0.01$ (two-tailed). *IA* = Information asymmetry; *EM* = Earnings management; *UI* = Underinvestment (1 = underinvestment; 0 = non underinvestment); *EM X UI* = Interactions between *EM* and *UI*; *LogSize* = Natural logarithm of total assets; *LEV* = Leverage, total debt divided by total equity.

CONCLUSION

The purpose of this study is to test the relationship between earnings management and information asymmetry. The study also investigates whether the relationship between earnings management and information asymmetry is moderated by an underinvestment problem. Earnings management has become an important topic in accounting research. However, the controversy over earnings management has

created two perspectives: opportunistic and informational. This research uses information asymmetry to justify whether earnings management is opportunistic or informational. Earnings management is opportunistic if its relationship with information asymmetry is positive, whereas it is informational when its relationship with information asymmetry is negative.

Our result indicates that earnings management is negatively related to information asymmetry. Our results support the informational perspective that earnings management contributes to the quality of information and hence reduces information asymmetry. This finding supports the results of Botosan (1997) and Verrecchia (2001) showing that the quality of information reduces information asymmetry. Furthermore, our results indicate that underinvestment moderates the relationship between earnings management and information asymmetry. The negative impact of earnings management on information asymmetry is greater for underinvesting firms than for non-underinvesting firms, which supports the hypothesis that earnings management reduces information asymmetry more for underinvesting firms. Thus, underinvestment can motivate managers to convey informational earnings management.

The findings support the signaling theory that predicts earnings management as information signaling firm performance (Morris, 1987). A signal (earnings management) sent by underinvesting firms is valued by an investor as credible and decreases asymmetric information. Therefore, our results show that accounting standards should have the flexibility to allow firms to use *DACC* (earnings management) to benefit users.

We acknowledge that this study is subject to several limitations. Firms in the finance, hotel, and mining industries and firms whose financial year does not end on 31 December are excluded from the sample. These firms may influence our results and raise questions about internal validity. In addition, Malaysia's sophisticated capital market efficiency differs from that of other countries. The generalisation of our findings to other countries should be performed with caution due to the diversity in accounting standards and regulations. This is also true in circumstances in which different ownership structures prevail because Malaysian firms have a high ownership concentration, which could influence decision making in investment and financing (Mohd-Saleh & Ahmed, 2005; Wang & Zhang, 2009). At the same time, these decisions could be affected by the control of a complex pyramidal ownership structure common among Malaysian firms (Wei & Zhang, 2008).

Even though underinvesting firms tend to reduce information asymmetry through *DACC*, their objective for decreasing capital costs is still unknown.

Therefore, future research may investigate whether earnings management by underinvesting firms reduces capital costs.

NOTES

1. Adverse selection refers to situations in which sellers possess information that buyers do not (or vice versa) about certain aspects of product quality. In a capital market, investors do not have complete information about firm quality or the future prospects of their investments.
2. By providing high-quality accounting information (Guay, Kothari, & Watts, 1996; Subramanyam, 1996).
3. Due to some disadvantages of the bid-ask spread as a proxy for information asymmetry (Morse & Ushman, 1983), some studies suggest using trade volume and the difference or stock price volatility (Krishnamurti, Šević, & Šević, 2005; Botosan, 2006). Both alternative measures are also subjected to criticism in measuring information asymmetry, particularly for thinly traded firms, which is common in emerging markets such as Malaysia. We must note, however, that the bid-ask spread is the most commonly used measure of information asymmetry and we acknowledge that the results should be interpreted with caution due to this limitation (Lim, Yeo, & Liu, 2003; Chen, Chen, & Wei, 2009).
4. Panel data offer several advantages (Hsiao, 2004, p. 3) over conventional cross-sectional or time-series datasets. Additionally, panel data can enrich the empirical analysis, which is not possible with cross-sectional and time-series data (Gujarati & Porter, 2009). According to Hsiao (2004), panel data improves the efficiency of econometric estimates because it provides a large number of data points, increases the degree of freedom and reduces the collinearity among independent variables.
5. The random effect transforms the OLS estimator into a GLS estimator. Therefore, serial correlation and heteroscedasticity should not be serious concerns.
6. We do not report the overall findings because doing so would require us to run several tests on the panel data. The results generally support the conclusion that earnings management is informative. (Please refer to Hassan, Mohd-Saleh, Rahman, & Abdul Shukor (2012) for further information).

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REFERENCES

Abarbanell, J., & Lehavy, R. (2003). Can stock recommendations predict earnings management and analysts' earnings forecast errors? *Journal of Accounting Research, 41*(1), 1–31.

Abdul Rahim, R., Yaacob, M. H., Alias, N., & Mat Nor, F. (2010). Investment, board governance and firm value: A panel data analysis. *International Review of Business Research Papers, 6*(5), 293–302.

Agung, J. (2000). Financial constraint, firms' investments and the channels of monetary policy in Indonesia. *Applied Economics*, *32*(13), 1637–1646.

Ahmad-Zaluki, N. A., Campbell, K., & Goodacre, A. (2011). Earnings management in Malaysian IPOs: The East Asian crisis, ownership control, and post-IPO performance. *The International Journal of Accounting, 46*(2), 111–137.

Ahmed, K., Godfrey, J. M., & Mohd-Saleh, N. (2008). Market perceptions of discretionary accruals by debt renegotiating firms during economic downturn. *The International Journal of Accounting, 43*(2), 114–138.

Akerlof, G. (1970). The market of 'lemons': Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics, 84*(3), 488–500.

Arya, A., Glover, J., & Sunder, S. (2003). Are unmanaged earnings always better for shareholders? *Accounting Horizons, 17*(1), 111–116.

Bartov, E., & Bodnar, G. M. (1996). Alternative accounting methods, information asymmetry and liquidity: Theory and evidence. *The Accounting Review, 71*(3), 397–418.

Ball, R., Robin, A., & Wu, J. S. (2003). Incentives versus standards: properties of accounting income in four East Asian countries. *Journal of Accounting and Economics, 36*(1–3), 235–270.

Beneish, M. D., & Vargus, M. E. (2002). Insider trading, earnings quality and accrual mispricing. *The Accounting Review, 77*(4), 755–791.

Bhattacharya, U., Daouk, H., & Welker, M. (2003). The world price of earnings opacity. *The Accounting Review, 78*(3), 641–678.

Biddle, G. C., & Hilary, G. (2006). Accounting quality and firm-level capital investment. *The Accounting Review, 81*(5), 963–982.

Biddle, G. C., Hilary, G., & Verdi, R. S. (2009). How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics, 48,* 112–131.

Boot, A. W. A., & Thakor, A. V. (1993). Security design. *Journal of Finance, 48*(4), 1349–1378.

Botosan, C. (1997). Disclosure level and the cost of equity capital. *The Accounting Review, 72*(3), 323–349.

Botosan, C. (2006). Disclosure and the cost of capital: What do we know? *Accounting and Business Research, 36,* 31–40.

Brown, S., Stephen, A. H., & Lo, K. (2004). Conference calls and information asymmetry. *Journal of Accounting and Economics, 37*(3), 343–366.

Burgstahler, D. C., & Eames, M. J. (2003). Earnings management to avoid losses and earnings decreases: Are analysts fooled? *Contemporary Accounting Research, 20*(2), 253–294.

Cahan, S. (1992). The effect of antitrust investigation on discretionary accruals: A refined test of the political cost hypothesis. *The Accounting Review, 67*(1), 77–95.

Callahan, C. M., Lee, C. M. C., & Yohn, T. L. (1997). Accounting information and bid-ask spreads. *Accounting Horizons, 11*(4)*,* 50–60.

Chan, K., Chan, L. K. C., Jegadeesh, N., & Lakonishok, J. (2006). Earnings quality and stock returns. *Journal of Business, 79*(3), 1041–1082.

Chaney, P., Jeter, D., & Lewis, C. (1998). The use of accruals in income smoothing: A permanent earnings hypothesis. *Advances in Quantitative Analysis of Finance and Accounting, 6,* 103–135.

Chen, K. C. W., Chen, Z., & Wei, K. C. J. (2009). Legal protection of investors, corporate governance, and the cost of equity capital. *Journal of Corporate Finance, 15,* 273–289.

Choi, J. H., Kim, J. B., & Lee, J. J. (2011). Value relevance of discretionary accruals in the Asian financial crisis of 1997–1998. *Journal of Accounting and Public Policy, 30,* 166–187.

Desai, H., Rajgopal, S., & Venkatachalam, M. (2004). Value-glamour and accruals mispricing: One anomaly or two? *The Accounting Review, 79*(2), 355–386.

Diamond, D. W., & Verrecchia, R. E. (1991). Disclosure, liquidity, and the cost of capital. *Journal of Finance, 46*(4), 1325–1359.

Driffield, N., & Pal, S. (2001). The East Asian crisis and financing corporate investment: Is there a cause for concern? *Journal of Asian Economics, 12,* 507–527.

Easley, D., & O'Hara, M. (2004). Information and the cost of capital. *Journal of Finance, 59*(4), 1553–1583.

Embong, Z., Mohd-Saleh, N., & Hassan, M.S. (2012). Firm size, disclosure and cost of equity capital. *Asian Review of Accounting*, *20*(2),119–139.

Erdem, T., & Swait, J. (1998). Brand equity as a signaling phenomenon. *Journal of Consumer Psychology, 7*(2), 131–157.

Fazzari, S. R., Hubbard, G., & Petersen, B. (1988). Financing constraints and corporate investment. *Brooking Papers on Economic Activity, 1,* 141–195.

Fields, T. D., Lys, T. Z., & Vincent, L. (2001). Empirical research on accounting choice. *Journal of Accounting and Economics, 31*(1–3), 255–307.

Flor, C. R., & Hirth, S. (2013). Asset liquidity, corporate investment and endogenous financing costs. *Journal of Banking and Finance, 37,* 474–489.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2005). The market pricing of accruals quality. *Journal of Accounting and Economics, 39,* 295–327.

Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2007). Information uncertainty and post-earnings-announcement-drift. *Journal of Business Finance & Accounting, 34*(3&4), 403–433.

Frankel, R., McNichols, M., & Wilson, G. P. (1995). Discretionary disclosure and external financing. *The Accounting Review, 70*(1), 135–150.

Gilchrist, S., & Himmelberg, C. P. (1995). Evidence on the role of cash flow in reduced-form investment equations. *Journal of Monetary Economics, 36*(3), 541–572.

Guariglia, A. (2008). Internal financial constraints, external financial constraints, and investment choice: Evidence from a panel of UK firms. *Journal of Banking and Finance, 32,*1795–1809.

Guay, W. A., Kothari, S. P., & Watts, R. L. (1996). A market-based evaluation of discretionary-accrual models. *Journal of Accounting Research, 34*(3), 83–105.

Guidry, F., Leone, A. J., & Rock, S. (1999). Earnings-based bonus plans and earnings management by business-unit managers. *Journal of Accounting and Economics, 26*(1–3), 113–142.

Gul, F. A., Leung, S., & Srinidhi, B. (2003). *Informative and opportunistic earnings management and the value relevance of earnings: Some evidence on the role of IOS* (Working paper). City University of Hong Kong.

Guo, F., Zhou, K., & Cai, J. (2008). Stock splits, liquidity, and information asymmetry—An empirical study on Tokyo Stock Exchange. *Journal of The Japanese and International Economies, 22,* 417–438.

Gujarati, D. N. (2003). *Basic econometrics* (International Edition, 4th Ed.). New York: McGraw-Hill/Irwin.

Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (International Edition, 5th Ed.). New York: McGraw-Hill/Irwin.

Hadlock, C. J. (1998). Ownership, liquidity, and investment. *Rand Journal of Economics, 29*(3), 487–508.

Harford, J. (1999). Corporate cash reserves and acquisitions. *Journal of Finance, 54*(6), 1969–1997.

Hassan, M. S., Mohd-Saleh, N., Rahman, A. F., & Abdul Shukor, Z. (2012). *Earnings management, underinvestment and value relevance of accounting numbers.* Proceedings the 13th Malaysia Indonesia Conference on Economics, Management and Accounting (MIICEMA) 2012, Palembang, Indonesia, pp. 205–230.

Holthausen, R. W., & Larcker, D. F. (1992). The prediction of stock returns using financial statement information. *Journal of Accounting and Economics, 15*(2–3), 373–411.

Hovakimian, A., & Hovakimian, G. (2009). Cash flow sensitivity of investment. *European Financial Management, 15,* 47–65.

Hsiao, C. (2004). *Analysis of panel data*. Cambridge, UK: Cambridge University Press.

Hsiao, C., & Tahmiscioglu, A. K. (1997) A panel analysis of liquidity constraints and firm investment. *Journal of the American Statistical Association, 92*, 455–465.

Hubbard, R. G. (1998). Capital market imperfections and investment. *Journal of Economic Literature, 36*(1), 193–227.

Hunt, H. G. (1985). Potential determinants of corporate inventory accounting decisions. *Journal of Accounting Research, 23*(2), 448–467.

Ismail, M. A., Ibrahim, M. H., Yusoff, M., & Zainal, M. P. (2010). Financial constraints and firm investment in Malaysia: An investigation of investment-cash flow relationship. *International Journal of Economics and Management, 4*(1), 29–44.

Jaggi, B., & Lee, P. (2002). Earnings management response to debt covenant violations and debt restructuring. *Journal of Accounting, Auditing and Finance, 17*(4), 295–324.

Jiraporn, P., Miller, G. A., Yoon, S. S., & Kim, Y. S. (2008). Is earnings management opportunistic or beneficial? An agency theory perspective. *International Review of Financial Analysis, 17*(3), 622–634.

Kaplan, S. N., & Zingales, L. (1997). Do financing constraints explain why investment is correlated with cash flow? *Quarterly Journal of Economics, 112*(1), 169–215.

Kim, O., & Verrecchia, R. (1994). Market liquidity and volume around earnings announcements. *Journal of Accounting and Economics, 17*(1–2), 41–67.

Kirmani, A., & Rao, A. R. (2000). No pain, no gain: A critical review of the literature on signaling unobservable product quality. *Journal of Marketing*, *64*(2), 66–79.

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accruals measures, *Journal of Accounting and Economics, 39*(1), 163–197.

Krishnamurti, C., Šević, A., & Šević, Ž. (2005). Voluntary disclosure, transparency, and market quality: Evidence from emerging market ADRs. *Journal of Multinational Financial Management, 15,* 435–454.

Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2005). *Applied linear statistical models* (5th Ed.). Boston: McGraw-Hill/Irwin.

Lang, M., & Lundholm, R. (1996). Corporate disclosure policy and analyst behavior. *The Accounting Review, 71*(4), 467–492.

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics, 69,* 505–527.

Leuz, C., & Verrecchia, R. E. (2000). The economic consequences of increased disclosure. *Journal of Accounting Research, 38*(3), 91–124.

Lim, C. Y., Yeo, G. H. H., & Liu, C. S. (2003). Information asymmetry and accounting disclosures for joint ventures. *The International Journal of Accounting, 38,* 23–39.

Modigliani, F., & Miller, M. (1958). The cost of capital, corporation finance, and the theory of investment. *American Economic Review, 48*(3), 261–297.

Mohamad, S., Hassan, T., & Ariff, M. (2007). Research in an emerging Malaysian capital market: A guide to future direction. *International Journal of Economics and Management*, *1*(2), 173–202.

Mohd-Saleh, N., & Ahmed, K. (2005). Earnings management of distressed firms during debt renegotiation. *Accounting and Business Research, 35*(1), 69–86.

Morgado, A., & Pindado, J. (2003). The underinvestment and overinvestment hypotheses: An analysis using panel data. *European Financial Management, 9*(2), 163–177.

Morris, R. D. (1987). Signalling, agency theory and accounting policy choice. *Accounting and Business Research, 18*(69), 47–56.

Morse, D., & Ushman, N. (1983). Effect of information announcements on the market microstructure. *The Accounting Review*, *58,* 247–258.

Myers, S., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, 13*(2), 187–221.

Ohlson, J. A. (1995). Earnings, book values and dividends in security valuation. *Contemporary Accounting Research*, *11*(2), 161–182.

Peasnell, K. V., Pope, P. F., & Young, S. (2000). Accrual management to meet earnings targets: UK evidence pre and post Cadbury. *The British Accounting Review, 32*(4), 415–445.

Poulsen, T. (2013). Corporate control and underinvestment. *Journal Management and Governance, 17,* 131–155.

Rangan, S. (1998). Earnings management and the performance of seasoned equity offerings. *Journal of Financial Economics, 50*(1), 101–122.

Richardson, V. J. (2000). Information asymmetry and earnings management: Some evidence. *Review of Quantitative Finance and Accounting, 15*(4), 325–347.

Schaller, H. (1993). Asymmetric information, liquidity constraints, and Canadian investment. *Canadian Journal of Economics, 26*(3), 552–574.

Sheu, H. J., & Lee, S. Y. (2012). Excess cash holdings and investment: the moderating roles of financial constraints and managerial entrenchment. *Accounting and Finance, 52*(Suppl.), 287–310.

Siregar, S. V., & Utama, S. (2008). Type of earnings management and the effect of ownership structure, firm size and corporate-governance practices: Evidence from Indonesia. *The International Journal of Accounting*, *4*, 1–27.

Skinner, D. J. (1993). The investment opportunity set and accounting procedure choice: preliminary evidence. *Journal of Accounting and Economics, 16*(4), 407–445.

Spence, A. M. (1973). Job market signaling. *Quarterly Journal of Economics, 87*(3), 355–374.

Spence, A. M. (1976). Informational aspects of market structure: An introduction. *Quarterly Journal of Economics, 90*(4), 591–597.

Stein, J. C. (2003). Agency, information and corporate investment. In G. M. Constantinides, M. Harris, & R. Stulz (Eds.). *Handbook of the Economics of Finance* (Vol. 1A, Chapter 2, pp. 111–163). Amsterdam: Elsevier Science B.V.

Subramanyam, K. R. (1996). The pricing of discretionary accruals. *Journal of Accounting and Economics, 22*(1–3), 249–281.

Teoh, H., Wong, T. J., & Rao, G. (1998). Are accruals during initial public offerings opportunistic? *Review of Accounting Studies, 3*(1–2)*,* 175–208.

Wang, A. W., & Zhang, G. (2009). Institutional ownership and credit spreads: An information asymmetry perspective. *Journal of Empirical Finance, 16,* 597–612.

Wasan, S. (2006). *Do accruals exacerbate information asymmetry in the market?* Unpublished doctoral dissertation, Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College.

Wei, J. K. C., & Zhang, Y. (2008). Ownership structure, cash flow, and capital investment: Evidence from East Asian economies before the financial crisis. *Journal of Corporate Finance, 14,* 118–132.

Welker, M. (1995). Disclosure policy, information asymmetry, and liquidity in equity markets. *Contemporary Accounting Research, 11*(2), 801–827.

Verrecchia, R. (2001). Essays on disclosure. *Journal of Accounting and Economics, 32*(1–3), 97–180.

Zhou, H. (2007). Auditing standards, increased accounting disclosure, and information asymmetry: Evidence from an emerging market. *Journal of Accounting and Public Policy, 26,* 584–620.