Information Asymmetry and Earnings Management: Causes of Inefficient Investment in Malaysia

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Abstract: Using data from 1998 to 2004 from180 manufacturing firms, the paper provides evidence that insiders, with controlling interest of more than 36.78 per cent, increase earnings management (discretionary accruals) by 10.6 per cent. However, they appear to be risk-adverse and avoid inefficient investment after the financial crisis. On the other hand, firms in high concentrated industries accelerate information asymmetry, but do not engage in earnings management. Our findings show that investment in Malaysia is dominated by inefficient investment. Through earnings management which inflates stock prices, firms increase investment at the expense of external shareholders as stock returns diminish before external shareholders realise the actual value of the firm's performance. A firm with negative stock returns is associated with a 37.6 per cent increase in discretionary accruals, which in turn leads to an additional 3.6 per cent in inefficient investment.

Keywords: Corporate governance, corporate investmentearnings management, information asymmetry

1. Introduction

Issues of corporate governance stem from the problem of information asymmetry, that is, when managers or insiders have the information that other external shareholders do not have. As such the managers or controlling shareholders can apply earnings management to escalate the problem of information asymmetry to protect their private interest (Richardson 2000). Chung *et al.* (2010) find that information asymmetry affects corporate governance while Guadalupe and Perez-Gonzalez (2006) show that improved information asymmetry can reduce agency costs and produce a more accurate performance evaluation.

Earnings management is the process where managers use their discretionary decision on accounting standards with the intent to manipulate reported results (Richardson 2000). It can be divided into managerial discretionary accruals which is opportunistic and value irrelevant as compared to non discretionary accruals which is an obligatory expense but yet to be realised in firms (Subramanyam 1996). Fan and Wong (2002) show that controlling owners manage income opportunities and create distortions in the reported earnings in East Asian economies. On the other hand, Bushee (2001) provides information on firms

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pursuing a strategy of meeting earnings target to maintain short term earnings growth but sacrifice long term investment in that process

In a recent study, Park *et al.* (2009) reported that Malaysia suffered a precipitous decline in investment rate from 45.6 per cent in 1999 to 22.1 per cent in 2004.[1] They found that firms in East Asian countries had over-invested in the pre-crisis period, and that the declining investment rates are actually at appropriate levels in the post-crisis period. This observation raises the issues of whether investments of firms are due to the 'catering channel', that is, firms manage earnings to maintain or increase the stock price of their firms. This means that firms over-invest when their share price is overvalued, and under-invest when their share price is undervalued (Rajgopal *et al.* 2007). Claessens *et al.* (2003) attribute misallocation of capital investment before the financial crisis to large shareholders of Malaysian firms. Polk and Sapienza (2009) also argue that the propensity of misallocation of investment is higher when the expected duration of mispricing is relatively long and shareholders have relatively short investment horizons.

The problem of information asymmetry becomes severe when there are chances for extracting private interest in the firm (Glosten and Milgrom 1985). Bebchuk and Roe (1999) argue that a prevailing environment of rent seeking provides private benefits and additional income than the minimum that a manager could have earned. A low level of industrial competition (highly concentrated industry) increases the propensity for the insiders (shareholders who are also board members) to extract private interest. In order to protect their interest, insiders tend to escalate information asymmetry so that they can effectively control the firm's decisions. Therefore, information asymmetry is severe in low competition industries which drive the cost of financing upwards and impede firms' value. In contrast, in a highly competitive industry, market competition forces firms to operate efficiently and competitively, and reduces information asymmetry between insiders and external minority shareholders.

Using data from 1998 to 2004 from 180 manufacturing firms, this study adds to our knowledge of earnings management and information asymmetry. We establish that insiders and firms with a high concentration ratio experience information asymmetric advantages which affect discretionary accruals. We also examine the issue of 'catering channel' and inefficient investment, where discretionary accruals lead to stock being over-priced and firms over investing; when stock are underpriced, firms over invest. The findings are important to our understanding of the link between corporate governance in earnings management to corporate investment in Malaysia.

The rest of this paper is organised as follows. Section 2 reviews related literature while Section 3 describes the methodology. Section 4 presents the empirical results and Section 5 concludes the paper.

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[1] Declining post-crisis investment is not exclusive to Malaysia. Thailand recorded a drop in investment rate from 42 per cent in 1996 to 33 per cent in 2004. Indonesia's investment rate was reduced from 30.4 per cent to 21.7 per cent in 1999, but has steadily recovered. In South Korea, after dropping from 37.6 per cent in 1996 to 30.8 per cent in 1998, the investment rate has remained more or less stable around 30 per cent since then (Park *et.al.* 2009).

2. Literature Review

2.1 Information Asymmetry and Its Causes

Bid-ask spread is widely used as a proxy to measure information asymmetry (e.g. Attig *et al.* 2006). Because of the informational disadvantages, external shareholders will post a wider bid-ask spread in stock prices to reduce their potential losses. A wider bid-ask spread benefits controlling shareholders who realise abnormal profits before the market adjusts its share prices to their real value, while external returns of shareholders diminish and lead to losses if they adopt a buy-and-hold strategy (Demsetz 1986). Empirically, Demsetz and Lehn (1985) concur that the level of information asymmetry is an increasing function of insider ownership, which in turn leads to a wider bid-ask spread in share prices.

The findings of the above view are inconsistent across different periods. For instance, Chiang and Venkatesh (1988) demonstrate that insider holdings are closely associated with information asymmetry for a sample of 56 NYSE stocks in the year 1973. Glosten and Harris (1988) show that the relationship is insignificant for a sample of 250 NYSE stocks over the 1981 to 1983 period. Sarin *et al.* (2000) provide evidence that higher insider ownership is associated with a wider bid-ask spread in a sample of 786 stocks on NYSE in the year 1984.

Choi *et al.* (2006) illustrate a positive relationship between information asymmetry and ownership structure in China. Moreover, the degree of information asymmetry is different between insider ownership and other institutional ownership. Maug (1998) suggests that information asymmetry reduces external shareholders' incentive to monitor firms, as insiders are able to exit from and enter into the stock market to gain abnormal returns. This makes it inexpensive for insiders to purchase additional shares. On the same note, Attig *et al.* (2006) show that in the presence of large shareholders, information asymmetry and costs of acquiring capital increases and consequently reduces the liquidity of the Canadian firms.

The differences between competitive and monopolistic industries are due to the availability of industry information (Guadalupe and Perez-Gonzalez, 2006). Firms in monopolistic industries avoid leakage of specific knowledge to competitors. Harris (1998) shows that firms in monopolistic industries provide fewer voluntary disclosures. Therefore, shareholders in such industries incur higher adverse information risks and they reflect it in a wider bid-ask spread. Chen *et al.* (2006) show that companies with poor information transparency and disclosure practices have a greater spread of bid-ask, implying that cost of equity is also higher.

If the market is efficient, a higher return is expected to compensate for the higher cost of trading due to a wider bid-ask spread. Amihud and Mendelson (1986) show that expected return is an increasing concave function of the bid-ask spread over the period 1961 to 1980 for NYSE stocks. Gaspar and Massa (2006) show that a less competitive industry implies lower market information asymmetry for investors and therefore lower return volatility if the market is efficient. In contrast, Li and Tang (2008) show that low information asymmetry does not lead to higher excess returns in China. This is because the inefficient market causes the uninformed investors to face an adverse selection problem. Other things being equal, investors who adopt a buy-and-hold strategy on a longer term will incur the cost of illiquidity losses.

2.2 Earnings Management and Its Causes

Information asymmetry is a precondition to the practice of earnings management (Trueman and Titman 1988). In addition, the magnitude of information asymmetry systematically explains the extent of income increasing accruals (Richardson 2000). Various studies also show that managers engage in opportunistic earnings management to improve earnings and stock prices so as to increase managerial compensation (e.g. Bergstresser and Philippon 2006). Warfield *et al.* (1995) prove that an inverse relationship exists between managerial ownership and earnings management while Leuz *et al.* (2003) prove that earnings management is profound in economies with a high concentrated ownership and weak investor protection. Fan and Wong (2002) argue that large controlling owners in East Asian economies protect their private interest via incredible reporting of accounting information. In addition, Teshima and Shuto (2008) conclude of the existence of a significant non monotonic relationship between managerial ownership and discretionary accruals for a sample of Japanese firms.

Existing theories that directly correlate industrial competition to earnings management are limited (Ronen and Yaari 2008). Guadalupe and Perez-Gonzalez (2006) provide evidence that market competition reduces managerial private benefits of control and show less frequent earnings management by virtue of competition improving the flow of firm-specific information. Marciukaityte and Park (2009) prove that industrial competition reduces agency problems by curtailing misleading earnings management. Firms in such industries are also associated with lower earnings forecast error. Nevertheless, Tinaikar and Xue (2009) provide evidence that firms in competitive industries apply earnings management to protect their private interest in control of the firm.

Empirical findings suggest that earnings increase that correspond to high accruals are low quality earnings and associated with poor future returns (Chan *et al.* 2006). Sloan (1996) concludes that stock prices of firms with high accruals underperform stock with low accruals. The negative stock returns in firms with high accruals are due to investor 'fixate' in earnings and failure to distinguish fully between the different properties of the accrual and cash flow components of earnings. Hence, stock returns may reflect naïve expectation on manipulated earnings. Rajgopal *et al* (2007) show that firms use earnings management through abnormal accruals to increase stock prices so that it caters to investors' appetite for positive surprises. Lastly, earnings management maximises the short run value of the firm, but leads to lower long-run values as prices correct accordingly (Baker *et al.* 2006).

2.3 Investment and Its Causes

Investment is one of the strategies to insulate firms from external monitoring. For instance, intra-firm investments can improve self-financing among divisions and reduce their dependence on external debtors. Lack of monitoring from external debtors increases controlling shareholders' opportunities to pursue over-investment strategies to enhance their position. Demsetz and Lehn (1985) corroborate that investment allows controlling shareholders to derive superior insider information which in turn allows them to realise pecuniary and non pecuniary returns as compensation for bearing a greater form of specific risk. Aggrawal and Samwick (2003) further confirm that insiders pursue investment in response to changes in private benefits rather than to reduce their exposure to business risks.

In Anglo-Saxon economies, Monks and Minow (1995) argue that large shareholders allow for monitoring and disciplining managers, ensuring that managers choose investment levels to maximise long-run value rather than to meet short-term earnings goals. However, Fan and Wong (2002) provide evidence that the number of diversified investments accelerates less informative earnings and lower cumulative market returns when there is an agency cost between large controlling shareholders and other minority shareholders. Li and Tang (2008) argue that firms with large positive discretionary accruals misallocate resources to fixed assets.

In less competitive environments, investment is a strategy to alter controlling owners' bargaining power to reduce the chances of being taken over by other parties (Zingales 1997). Investment can also yield power in an anti-competitive way through cross-subsidisation to support predatory pricing, reciprocal buying and others. Hence, investment can further drive out competitors from the industry and reduce market competition (Datta *et al.* 1991). As such, firms in such industries enhance information asymmetry and earnings management which essentially drives them into being involved in inefficient investment.

Stein's (1996) model states that firms in need of external equity finance will have investments that are especially sensitive to the non fundamental component of stock prices. In this regard, firms with large positive discretionary accruals have lower stock returns in the future, suggesting a lower cost of capital that helps them to raise external capital for investment purpose. In this regard, Rajgopal *et al.* (2007) provide evidence that managers pursue earnings management strategy by altering discretionary accruals to gain rights issues and raise stock prices to increase investment in firms. Using firms involved in USA's seasoned equity offering from 1991 to 2001, Lim *et al.* (2008) find that earnings management is related to firms' seasoned equity offering and diversification activities. Similarly, Polk and Sapienza (2009) argue that through the 'catering channel', managers boost short-run share prices by managing firms' earnings so as to increase investment. In this perspective, firms are inclined to over-invest when their stock prices are overpriced and under-invest when their share prices are underpriced. The mispricing proxy results in roughly a 2 per cent change in the firms' investment. As a result of share overpricing, firms with large positive discretionary accruals have a lower stock return in the future, suggesting a lower cost of capital for firms to pursue their investment (Defond and Park 2001).

3. Methodology

3.1 Model Specification

Equation 1 determines the causes of industrial asymmetry from the perspective of insiders, industrial competition and stock returns. By virtue that information asymmetry is the precondition for earnings management, we use the degree of insider controlling interest, industrial concentration ratio and negative stock returns, which have information asymmetry advantage, respectively to determine earnings management in Equation 2. Lastly, we applied these variables to examine whether they manage earnings to influence investment in equation 3.

$$ABS_{it} = a_0 + a_1 INS_{it} + a_2 INS^2_{it} + a_3 IND_{it} + a_4 IND^2_{i,t} + a_5 CAR_{it} + a_6 VOLM_{it}$$
$$+ a_7 VOLT_{it} + a_8 LGDEBT_{it} + a_9 LGCFSALES_{it} + a_9 YEAR_t + u_{it} ----- Equation \quad 1$$

where

ABS = information asymmetry, measured as Average Quarterly Bid-Ask Spread.

INS = insider ownership as a percentage of total shares owned by largest shareholder who is also a member of board of directors

IND = industrial concentration ratio for four largest producers in each industry using the 5 digit Malaysia Industrial Standard Classification

CAR = cumulative quarterly share returns

VOLM = average quarterly trading volume

VOLT = standard deviation of quarterly share price

LGDEBT = logarithms of total debt

LGCFSALES = logarithms of cash flows over sales

Following Attig *et al.* (2006), we calculated the average value of the quarterly bid-ask spread (ABS), measured as $\left[\dfrac{(Ask - Bid)}{\dfrac{(Ask + Bid)}{2}}\right]$. Bid-ask spread is the posted spread at which a dealer is willing to sell and the price at which he is willing to buy a certain share.

We include the non linear term of insider ownership (INS and INS^2) in Equation 1. A negative sign at the lower level of controlling interest (INS) indicates that information asymmetry declines. A positive sign for INS^2 implies that information asymmetry increases at a higher level of controlling interest. A positive INS^2 therefore enables us to establish the dummy point (DINS) where large shareholders enhance information asymmetry and subsequently affect earnings management as illustrated in Equation 2.

At a lower level of industrial concentration ratio (IND), industrial competition will reduce information asymmetry. However, at a higher level of industrial concentration ratio (IND^2), low competition will lead to a higher information asymmetry. From Equation 1, we determine the dummy for industrial competition ratio (DIND) where information asymmetry is escalated. Equation 2 applies DIND conditional to information asymmetry to explain earnings management. We use cumulative quarterly share returns (CAR) as the measurement for share returns and expect a negative relationship with the bid-ask spread. The negative returns reflect that stock is over-priced and leads to negative returns. The microstructure variables applied are average quarterly trading volume (*VOL*), and volatility (*VOLT*), measured as standard deviation of quarterly share returns.

In Equation 2, we address the issue whether earning management is due to insiders, and industry, and negative stock returns with information asymmetry, respectively. Following Subramanyam (1996), Polk and Sapienza (2009), we use discretionary accruals (*DAC*) as the measurement for earnings management.

$$DAC_{i,t} = a_0 - a_1 ABS_{i,t} - a_2 ABS_{i,t} \bullet DINS_{i,t} - a_3 ABS_{i,t} \bullet DIND_{i,t} - a_4 ABS \bullet DCAR - a_5 LGDEBT_{i,t} + a_6 LGCFSALES_{i,t} + \varepsilon_{i,t} \; - - - \; Equation \; 2$$

where DAC = discretionary accruals

DINS = dummy equals 1 when large insider controlling interest is more than 36.78 per cent, derived from equation 1, otherwise equals 0 (see footnote 3)

DIND = dummy equals 1 when industrial concentration ratio is more than 0.65, derived from equation 1 (see footnote 4).

DCAR = dummy equals 1 for cumulative negative quarterly stock returns at year t.

Discretionary accruals (*DAC*) is the residual ($e_{j,t}$) of Equation 2a which reflects managerial discretion. Total accruals (*ACCR*) are the difference between net income and operating cash flows.

$$\frac{ACCR_{(i,t)}}{TA_{j,t-1}} = \alpha \bullet [\frac{1}{TA_{j,t-1}}] + \beta \bullet [\frac{\Delta Rev_{j,t}}{TA_{j,t-1}}] + \gamma [\frac{PPE_{j,t}}{TA_{j,t-1}}] + e_{j,t} \text{———Equation 2a}$$

where $ACCR_{j,t}$ is total accruals for firm j in year t, $TA_{j,t}$ refers to total assets, $\Delta Rev_{j,t}$ is the change in net revenue, and $PPE_{j,t}$ refers to property, plant and equipment. All variables are deflated by total assets at the beginning of the period.

We predict positive findings for all the main variables in Equation 2. A insider with information asymmetry advantage (DINS x ABS) is expected to further protect his interest through earnings management. A less competitive industry with information asymmetry (DIND x ABS) will enhance earnings management. Lastly, firms with information asymmetry with negative stock return, proxy for stock over-price (ABS x DCAR), are associated with higher discretionary accruals.

Equation 3 examines whether investment is due to the interaction relationship of earnings management (DAC) with insider information advantage (DINS), industries with information advantage (DIND) and negative stock returns (DCAR), respectively.

$$INVEST_{i,t} = a_0 + a_1 DAC_{i,t-1} + a_2 DAC_{i,t-1} \bullet DINS_{i,t-1} + a_3 DAC_{i,t-1} \bullet DIND_{i,t-1} + a_4 DAC_{i,t-1} \bullet DCAR_{i,t-1}$$
$$+ a_5 LGDEBT_{i,t} + a_6 LGCFSALES_{i,t} + \varepsilon_{i,t} \text{ ---- Equation 3}$$

Investment (INVEST) is defined as capital expenditure on fixed assets other than those associated with acquisitions. It is deflated by total asset at the beginning of the period *t-1*.

Tobin's Q (TBQ) is also applied to control for the efficient investment in Equation 3. It is measured as firm's market value plus total debt divided by book assets. It is argued that when TBQ>1, firms have an incentive to invest because replacement cost (book assets as proxy) is cheaper. Firms should stop investing when TBQ<1, because replacement cost is higher for new investments.

A positive coefficient on the interaction between *DAC* and *DINS* is interpreted as large insiders with information advantage (*DINS*) using earnings management to enhance investment. Similarly, a positive interaction term between DIND and DAC reflects firms in a less competitive industry using earnings management to increase investment. Finally, consistent with prior literature, a positive coefficient for the interaction term of DCAR and DAC indicates that earnings management cause share price to be overvalued, leading to over-investment.

We use logarithms of total debt (LGDEBT) and cash flows over sales (LGCFSALES) as proxies for the riskiness of firms. Debt could reduce information asymmetry and chances of earnings management and improve efficient investment. On the other hand, firms with ample debt capacity and cash flows over sales may have an incentive to waste resources in inefficient investment. Table 1 summarises the variables used in this study.

Table 1. Description of variables

Variables	Definitions
Information Asymmetry(ABS)	Bid-ask spread is the posted spread at which a dealer is willing to sell and the price at which he is willing to buy a certain share. $$ABS = \frac{(Ask - Bid)}{\left[\dfrac{(Ask + Bid)}{2}\right]}$$
Insider Ownership (INS) Insider owners having information advantage (DINS)	Percentage shares owned by the largest shareholder who is also a member of board of directors. Dummy equals 1 when insider controlling interest is more than 36.78%, derived from equation 1 (see footnote 3).
Industrial Concentration Ratio (IND) Industry sector with information advantage (DIND)	Industrial concentration ratio for four largest producers in each industry using the 5 digit Malaysia Industrial Standard Classification Dummy equals 1 when insider controlling interest is more than 0.65, derived from equation 1 (see footnote 4).
Cumulative average share returns (CAR) Cumulative negative quarterly share returns (DCAR)	Cumulative quarterly share returns Dummy equals 1 when cumulative quarterly share returns is a negative value.
Earnings management (DAC)	Discretionary accruals as proxy for earnings management. It is the residual value ($e_{j,t}$)from $$\frac{ACCR_{j,t}}{TA_{j,t-1}} = \alpha \bullet (\frac{1}{TA_{j,t-1}}) + \beta \bullet (\frac{\Delta Rev_{j,t}}{TA_{j,t-1}}) + \gamma(\frac{PPE_{j,t}}{TA_{j,t-1}}) + e_{j,t}$$ where ACCR equals the difference between net income and operating cash flows; TA refers to total assets; Δ Rev is the change in net revenue; PPE refers to property, plant and equipment
Investment (INVEST)	Capital expenditure on fixed assets which represents the funds used to acquire fixed assets other than those associated with acquisitions. Total asset at $t-1$ is applied to normalise investment of the firms
Total debt (LGDEBT)	Logarithm of total debt
Cash Flows (LGCFSALES)	Logarithms of cash flow over sales
Trading volume (VOLM)	Average quarterly trading volume
Volatility (VOLT)	Standard deviation of quarterly share returns
Tobin's Q (TBQ)	Firms' market value plus total debt divided by book assets

3.2 Sample and Data Collection

Based on firms listed in KLSE Handbooks and companies' annual reports for 2000, there were 256 firms. We shortlisted 180 firms which were free of the PN4 list, changes in business activities and sufficient ownership structure date from 1998 to 2004.[2]. Based on 5-digit Malaysia Standard Industrial Classification (MSIC) codes, 68 sectors were identified. The industrial concentration data was collected from the Department of Statistics, Malaysia. The bid-ask spread data was obtained from DataStream. Other financial data were collected from Thomson Financial Database.

4. Findings

4.1 Descriptive Statistics

In Table 2, the mean and median of average quarterly spreads (ABS) are 0.0177 for all 1080 firms' years compared to 0.0233 during the crisis (180 firms). Discretionary accruals (DAC)

Table 2. Descriptive statistics

Variable		Mean	Median	Std.Dev.	Max	Min
ABS	All Sample	0.0177	0.0064	0.02520	0.12	0.001
	1998	0.0233	0.0146	0.02825	0.11	0.001
DAC	All Sample	0.001	-0.0014	0.2233	0.94	-6.67
	1998	-0.061	-0.0408	0.2194	0.25	-1.69
INVEST	All Sample	33.91	6.78	118.72	1987.72	0.00
	1998	82.98	15.54	239.14	1810.94	0.42
INVEST/TA$_{t-1}$	All Sample	0.0626	0.0283	0.4803	17.56	0.00
	1998	0.0735	0.0442	0.1099	0.88	0.00
CAR	All Sample	0.1681	0.0749	0.7112	7.61	-1.89
	1998	0.3100	0.1685	0.9808	7.61	-1.89
TBQ	All Sample	0.9223	0.7600	0.6566	9.56	0.10
	1998	0.8768	0.7300	0.5066	3.38	0.23
VOLM	All Sample	0.2546	0.0300	1.4951	39.44	0.00
	1998	0.2441	0.0390	0.8768	8.05	0.00
VOLT	All Sample	0.3761	0.1960	1.148	29.11	0.00
	1998	0.7622	0.2942	2.7589	29.11	0.01
INS	All Sample	0.35	0.347	0.159	0.77	0.01
IND	All Sample	0.4269	0.38	0.247	0.92	0.00
DEBT	All Sample	202.20	41.80	580.23	8719.02	0.00
	1998	306.13	68.12	574.66	2710.69	0.00

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[2] The sample period from 1998 to 2004 allows us to track a short market cycle, including the financial crisis and their recovery period. Mitton (2002) suggests that the crisis period provides opportunities to the controlling owner to divest resources from profitable investment projects.

Table 2. Continued

LGDEBT	All Sample	3.8466	3.9196	1.9432	9.07	-4.61
CFSALES	*All Sample*	12.93	9.37	18.6196	342.15	0.00
	1998	14.07	10.08	19.79	143.30	0.00
LGCFSALES	All Sample	2.184	2.249	0.8992	5.84	-4.61

Average quarterly bid-ask spread (ABS) measures information asymmetry in the firms. Discretionary accrual (DAC) measures earning management obtained from Equation 2a. INVEST refers to capital expenditure on fixed assets which represents funds used to acquire fixed assets other than those associated with acquisition. Tobin's Q (TBQ). Cumulative quarterly share returns (CAR). Average quarterly trading volume (VOLM). Standard deviation of quarterly stock prices (VOLT). Shares owned by insiders (INS). Industrial concentration ratio (IND) for four largest producers in each industry at 5-digit Malaysia Industrial Standard Logarithm of total debt (LGDEBT). Logarithm of cash flow divided by sales (LGCFSALES).

had a negative value of -0.061 in 1998 compared to other all sample years of 0.001. This corresponds to capital investment (deflated by total assets) of 0.07 in 1998, while investment for all sample firms was 0.0626, indicating higher investment in the immediate post-crisis period. The negative discretionary accruals imply that cost of equity was higher during the crisis period and firms would not be able to avoid external debt financing (Xie 2001). This corresponds to a significant higher debt of RM306.13 million in 1998. The mean for cash flows over sales was also high in 1998. Lastly, average quarterly share returns (CAR) were also higher at 0.31 in 1998 over the average whole sample years. Apparently, investment was higher in 1998 with an average of RM82.98 million, compared to overall sample mean of RM33.91 million. The average Tobin's Q value was 0.922.

Table 3 gives the Pearson correlation matrix among the variables in our sample. None of the variables show a significant high correlation. We find a negative correlation between bid-ask spread (ABS) and share returns (CAR) indicating that firms' shares are overpriced. In contrast to our predictions, the preliminary findings show that insiders and industrial concentration ratio are negatively related to bid-ask spread.

The negative correlations between Insiders (INS) and CAR reveal the problem of agency costs. There is also a significant positive relationship between earnings management (DAC) and ABS, confirming information asymmetry is a precondition for earnings management. In contrast to prediction, there is a significant negative correlation between DAC and investment (INVEST). The relationship of DAC and INS is positive but insignificant. CAR also shows a negative but insignificant relationship with DAC and INVEST, respectively.

4.2 Information Asymmetry and Its Causes
Table 4 reports the regression results of Equation 1 with average bid-ask spread (ABS) as the dependent variable. All the regressions were performed using the generalised least square method (GLS). The influences of INS and INS^2 on ABS follow a non linear relationship and are statistically significant at the 1 per cent level. The negative INS' coefficient, indicating entrenchment effects increase information asymmetry. As insiders' interest increases (INS^2), the positive sign indicates that the convergence of interest between insiders and external

Table 3. Correlations

	Invest	DAC	ABS	INS	IND	CAR	LGDEBT	LGCFSALES	VOLM
DAC	(-0.0500)*								
ABS	(0.0857)***	(0.1042)***							
INS	(-0.0007)	(0.0108)	(-0.0352)						
IND	-0.0332	(-0.0774)**	(-0.0679)**	(0.1404)***					
CAR	(-0.0383)	(-0.0489)	(-0.0745)**	(-0.0833)**	(-0.01286)				
LGDEBT	-0.0063	(-0.1308)***	(-0.1478)***	(0.1216)***	(0.1784)***	(0.1120)***			
LGCFSALES	(0.1248)***	(-0.0790)***	(0.0221)	(0.0673)**	(-0.1431)***	(0.0399)	(-0.0240)		
VOLM	-0.0172	(-0.0321)	(-0.0664)**	(-0.0163)	(-0.0192)	(0.0495)*	(0.0735)**	(0.0936)***	
VOLT	-0.0161	(-0.0908)**	(0.0481)*	(-0.0813)**	(0.0023)	(0.0578)**	(0.0826)**	(0.0133)	(0.0252)

Average quarterly bid-ask spread (ABS) measures information asymmetry in the firms. Discretionary accrual (DAC) measures earning management obtained from Equation 2b. INVEST refers to capital expenditure on fixed assets which represents funds used to acquire fixed assets other than those associated with acquisition. Cumulative quarterly share returns (CAR). Average quarterly trading volume (VOLM). Standard deviation of quarterly stock prices (VOLT). Shares owned by insiders (INS). Industrial concentration ratio (IND) for four largest producers in each industry at 5-digit Malaysia Industrial Standard Logarithm of total debt (LGDEBT). Logarithm of cash flow divided by sales (LGCFSALES)

*   Significant at the 10% level.
**   Significant at 5% level.
***   Significant at 1% level. *t*-statistics are in parentheses.

Table 4. Information asymmetry (bid-ask spread) and its causes

Dependent: Variable	ABS Model 1	ABS Model 2	ABS Model 3	ABS Model 4
C	0.0265 (16.2801)***	0.0285 (17.0262)***	0.0286 (30.8398)***	0.0316 (37.8371)***
INS	-0.0472 (-6.2877)***	-0.0462 (-10.094)***	-0.0216 (-5.5044)***	-0.0220 (-4.4710)***
INS²	0.0747 (5.4685)***	0.0748 (7.9529)***	0.0320 (3.5486)***	0.0299 (2.5861)**
IND	-0.0218 (-3.4332)***	-0.0203 (-6.6304)***	-0.0185 (-3.9912)***	-0.0217 (-5.7762)***
IND²	0.0158 (2.5904)**	0.0142 (3.9912)***	0.0137 (2.8786)**	0.0167 (4.2618)***
CAR	-0.0016 (-2.8301)**	-0.0019 (-4.4621)***	-0.0023 (-2.4121)**	-0.0015 (-3.0926)**
VOLM	-0.0034 (-2.8487)**	-0.0033 (-3.2291)**	-0.0012 (-1.9491)*	-0.0014 (-2.4185)**
VOLT	0.0008 (5.531)***	0.0005 (5.2045)***	-0.0004 (-0.4873)	-0.0030 (-5.6677)***
LGDEBT			-0.0013 (-6.2466)***	-0.0010 (-6.5862)***
LGCFSALES			0.0000 (0.0378)	0.0003 (0.4939)
Y99		-0.0007 (-0.4986)		-0.0017 (-1.3232)
Y00		0.0032 (2.0314)**		0.0047 (3.5075)***
Y01		0.0035 (2.2158)*		0.0022 (1.4671)
Y02		-0.0044 (-2.8732)**		-0.0046 (-3.1724)**
Y03		-0.0065 (-4.4786)***		-0.0070 (-4.8599)***
Y04		-0.0062 (-4.1357)***		-0.0081 (-5.4789)***
R²	0.2981	0.4326	0.4327	0.3713
Adj.R²	0.2938	0.4261	0.4259	0.3585
Std.Error	0.0239	0.0236	0.0236	0.0229
F-statistic	69.1075	66.4443	63.2305	29.1332
Prob	0.0000	0.0000	0.0000	0.0000

Average quarterly bid-ask spread (ABS) measures information asymmetry in the firms. Cumulative quarterly share returns (CAR). Average quarterly trading volume (VOLM). Standard deviation of quarterly stock prices (VOLT). Shares owned by insiders (INS). Industrial concentration ratio (IND) for four largest producers in each industry at 5-digit Malaysia Industrial Standard Logarithm of total debt (LGDEBT). Logarithm of cash flow divided by sales (LGCFSALES).

*   Significant at the 10% level.
**   Significant at the 5% level.
*** Significant at the 1% level.

t-statistics are in parentheses.

shareholders reduce information asymmetry in firms. The coefficients are consistent when we include control variables LGDEBT and LGCFSALES, and year effects in models 2, 3 and 4. In model 4, we found that when INS^2 exceeds 36.78 per cent[3], firms start to enhance information asymmetry by 3 per cent, compared to a reduction of 2.2 per cent if insiders' interest is lower than 36.78 per cent. Insiders with equity interest of above 36.78 per cent are said to have information asymmetric advantages (DINS), dubbed dummy equals 1, otherwise 0. We applied the dummy to investigate whether they have caused earnings management in Equation 2, and affect investment in Equation 3.

In all models in Table 4, industrial concentration consistently indicates that information asymmetry (ABS) is non inearly aligned to industrial concentration ratio (IND). A negative sign of -0.021 in model 4 indicates that high competition industries (IND, low industrial ratio) have less information asymmetry as compared to low competition industries (IND^2, high industrial ratio) with a positive coefficient of 0.0167 ($p<0.001$). By differentiating both coefficients, information asymmetry is found to be higher when industrial ratio reaches 0.65.[4] The industries with an industrial concentration ratio of above 0.65 are said to have information asymmetric advantages (DIND), and dubbed dummy equals 1, otherwise 0. We applied the dummy to investigate whether firms in this type of industry (DIND) are causing the problem of earnings management in Equation 2 and subsequently engage in earnings management for the purpose of investment.

Consistent with previous findings, cumulative quarterly stock returns show a negative relationship with ABS. This indicates that external shareholders lose out in a longer time horizon as the problem of information asymmetry increases. Information asymmetry is found to reduce market liquidity in Malaysia as illustrated by the negative coefficient between share volume (VOLM) and ABS. Inclusion of LGDEBT and LGCFSALES turns the VOLT coefficient sign from positive to negative showing that debt and cash flows reduce market volatility in firms. A negative sign of LGDEBT and ABS implies that through external monitoring, debt can reduce the problem of information asymmetry.

Lastly, using 1998 as base year in model 4, information asymmetry was the highest in 2000. The year effects are consistent with the findings in model 2. The problem of information asymmetry was also significantly reduced from 2002 to 2004 compared to 1998.

4.3 Earnings Management and Its Causes

Table 5 reports the findings for Equation 2 where discretionary accruals are applied to the dependent variable. The level year is applied in model 1 to model 4, while a lag year is applied in models 5 and 6. Consistent with the argument that information asymmetry is a precondition for the practice of earnings management, the bid-ask spread (ABS) shows a positive relationship with DAC in all models in Table 5.

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[3] The value is calculated based on differentiation of y= $0.0299x^2$ -0.0220x, $\frac{dy}{dx}$ = 0.0598x-0.0220 =0, x=36.78%.

[4] The value is calculated based on differentiation of y= $0.0167x^2$ -0.0217x, $\frac{dy}{dx}$ = 0.0334x-0.0217 =0, x=0.65.

Table 5. Earnings management (discretionary accruals) and its causes

Dependent Variable	DAC Model 1	DAC Model 2	DAC Model 3	DAC Model 4	DAC Model 5	DAC Model 6
C	0.0530 (5.7549)***	-0.0049 (-52.0812)***	0.0523 (5.6313)***	-0.0049 (-56.1628)***	0.8867 (5.7219)***	0.3743 (6.1408)***
ABS_t	0.1356 (1.8875)**	0.3128 (5.9766)***	0.1130 (1.7111)*	0.2675 (6.6053)***		
ABS_{t-1}				0.2667 (2.9703)**	0.1588 (3.6984)***	0.3187 (5.2315)*
$(ABS*DINS)_t$	0.1068 (1.6789)*	0.1891 (2.4219)**	0.1452 (2.4453)**			0.0060 (1.6393)*
$(ABS*DINS)_{t-1}$					0.4405 (2.8526)**	
$(ABS*DINBD)_t$	-0.3407 (0.7334)					
$(ABS*DIND*DINS)_t$		-1.0281 (-5.0768)***	-0.2144 (-0.7132)	-1.0162 (-4.9125)***		
$(ABS*DIND*DINS)_{t-1}$					0.0107 (2.0577)**	0.0882 (0.2477)
$(ABS*DCAR)_t$	0.3759 (4.2453)***	0.3252 (2.8322)**	0.3734 (-4.5240)***	0.4101 (2.7129)***		
$(ABS*DCAR)_{t-1}$					0.4516 (5.8322)***	
$(ABS*DCAR*DINS)_t$				-0.1340 (-0.6769)		(2.5109)**
LGDEBT	-0.0135 (-20.8572)***		-0.0135 (-23.9737)***			-0.0128 (16.5934)***

Table 5. Continued

LGCFSALES	-0.0050 (-2.0384)**	-0.0049 (-2.0158)**			-0.004421 (-2.3648)**
Y99	0.0078 (1.4766)	0.0083 (1.5973)			
Y00	-0.0084 (-1.3567)	-0.00799 (-1.3012)			
Y01	-0.0046 (-0.8947)	-0.0042 (-0.8173)			
Y02	0.0020 (0.3147)	0.0027 (0.4167)			
Y03	0.0119 (2.0575)**	0.0117 (1.99811)**			
Y04	0.0277 (4.0711)***	0.0279 (4.0954)***			
R^2	0.5939	0.6829	0.3456	0.1001	0.3030
Adj.R^2	0.5867	0.6773	0.3420	0.0962	0.2966
Std.Error	0.0816	0.0817	0.1340	0.1312	0.0841
F-statistic	82.6139	121.6985	94.1247	25.7092	47.4511
Prob	0.0000	0.0000	0.0000	0.0000	0.000

Discretionary accrual (DAC) measures earning management. Average quarterly bid-ask spread (ABS) measures information asymmetry. Dummy for cumulative negative quarterly share returns (DCAR). Dummy for shareholders control more than 36.7% (DINS). Dummy for industrial concentration ratio more than 0.65 (DIND). Logarithm of total debt (LGDEBT). Logarithm of cash flow divided by sales (LGCFSALES). *Significant at 10% level. **Significant at 5% level. ***Significant at 1% level. *t*-statistics are in parentheses.

In model 1, the findings confirm that insiders who control more than 36.78 per cent and with information asymmetry advantages (ABS x DINS) increase firms discretionary accruals by 10.6 per cent. Similarly, there is a 37.6 per cent increase in discretionary accruals in a negative stock returns firms having the problem of information asymmetry (ABS x DCAR). Moreover, the findings imply that the financial statement is overstated and share prices have been overvalued. The findings are consistent when we apply a lag year analysis in model 5 and model 6.

In model 1, there is no evidence that a highly concentrated industry with ratio of more than 0.65 and associated with information asymmetry (ABS x DIND) engages in earnings management. Expanding Equation 2 to include whether a large insider exist in such a environment (ABS x DIND x DINS) in models 2, 3 and 4 do not show positive earnings management in such firms. In model 5, there is a positive coefficient for ABS x DINDx INS at t-1, but it becomes insignificant when control variables are included in model 6.

The control variables, LGDEBT and LGCFSALES show a negative relationship with earnings management. With the exception of ABS x DINDx INS at t-1, inclusion and exclusion of the control variables do not change the coefficient signs of other variables under study. In summary, the above findings show that the magnitude of information asymmetry on large shareholders and negative stock returns affect magnitude of earnings management systematically. However, the year effects on information asymmetry and earnings management do not seem to be consistent. Earnings management seems to be in the increasing trend since 2002, becoming significantly higher in 2003 and 2004 compared to 1998 (Table 5). This trend does not fit well with Table 4 as information asymmetry tends to decline from 2002 to 2004.

The use of lag year in models 5 and 6 is to avoid the endogenous effects which may influence the relationship between information asymmetry and earnings management. The relationships in models 5 and 6 are consistent with the findings from model 1 to model 4. It shows that if there is a possibility of endogenous effects, using ordinary least square in this study does not render the inference invalid.

4.4 Investment and Its Causes

The regression results of Equation 3 are reported in Table 6. In models 4 and 5, we use Tobin's Q (TBQ) to control for the efficient investment. Apparently, earnings management (DAC) consistently establishes a direct positive relationship with investment throughout the models. In contrast to prediction, earnings management does not indulge insiders with controlling interest more than 36.7 per cent (DINS) to increase investment for their own private benefit. The signs are significantly negative throughout the five models. It implies that large shareholders in this economy are risk adverse. They use earnings management for their own benefits rather than further increase their risk through investment. The result is further confirmed in model 4 as we control for inefficient investment (TBQ<1), the coefficient of $DAC_{t-1}*DINS_{t-1}$ continues to show a significant negative relationship with investment, and turns into an insignificant negative relationship in model 5, when applied for efficient investment (TBQ>1).

We have proven that the interaction term of DIND and ABS does not increase earnings management. Similarly, the argument that firms of DIND engage in earnings management to increase investment is not substantiated. The relationship of $DAC_{t-1}*DIND_{t-1}$ and

Table 6. Investment and earnings management

Dependent variable	INVEST Model 1	INVEST Model 2	INVEST Model 3	INVEST Model 4 (TBQ<1 n=117 Firms)	INVEST Model 5 (TBQ>1 n=63 Firms)
C	0.034 (55.264)***	0.018 (4.045)**	0.022 (4.613)***	0.014 (3.733)***	0.028 (3.2288)***
DAC_{t-1}	0.085 (5.033)***	0.032 (5.112)***	0.033 (4.564)***	0.123 (5.591)***	0.015 (2.4478)**
$DAC_{t-1}*DINS_{t-1}$	-0.257 (-7.679)***	-0.069 (-2.151)**	-0.090 (-3.018)***	-0.134 (-6.027)***	-0.033 (-1.0713)
$DAC_{t-1}*DIND_{t-1}$	-1.599 (-3.547)***	0.018 (0.562)	0.022 (0.653)	0.020 (0.575)	-0.469 (-11.3001)***
$DAC_{t-1}*DCAR_{t-1}$	0.139 (4.596)***	0.048 (1.778)*	0.061 (2.004)**	0.036 (1.755)*	-0.119 (-4.0569)***
LGDEBT		0.001 (0.927)	0.000 (0.123)	0.002 (3.366)***	0.000 (0.3277)
LGCFSALES		0.011 (9.897)***	0.010 (7.724)***	0.010 (6.558)***	0.008 (1.9645)**
Y99			0.000 (0.196)	0.002 (0.849)	0.000 (-0.0697)
Y00			-0.008 (-9.149)***	-0.007 (-9.431)***	-0.015 (-2.0986)**
Y01			0.000 (-0.177)	-0.001 (-2.039)**	0.019 (6.3557)***
Y02			0.005 (-4.024)***	0.000 (1.151)	0.012 (2.8269)***
Y03			-0.004 (-5.962)***	-0.001 (-0.792)	0.001 (0.3896)
Y04			0.005 (8.347)***	0.003 (7.231)***	0.015 (3.5731)***
R^2	0.391	0.090	0.602	0.762	0.906
Adj.R^2	0.389	0.083	0.595	0.757	0.905
Std.Error	0.107	0.062	0.062	0.055	0.073
F-statistic	155.910	12.280	92.959	160.493	714.571
Prob	0.000	0.000	0.000	0.000	0.000

INVEST refers to capital expenditure on fixed assets which represents funds used to acquire fixed assets other than those associated with acquisition. Tobin's Q (TBQ). Cumulative quarterly share returns (CAR). Discretionary accrual (DAC) measures earning management obtained from equation 2a. Dummy for cumulative negative quarterly share returns (DCAR). Dummy for shareholders control more than 36.7% (DINS). Dummy for industrial concentration ratio more than 0.65 (DIND). Logarithm of total debt (LGDEBT). Logarithm of cash flow divided by sales (LGCFSALES).

* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

t-statistics are in parentheses.

investment is negative in model 1, but turns into a positive sign when control variables and year effects are included in model 2 and model 3. In model 4, when we control for firms with TBQ<1, it is an insignificant positive relationship indicating that firms in highly concentrated industries do not significantly pursue investment to protect their private interest. In fact, if firm's have an opportunity to pursue efficient investment (TBQ>1), they reduce their investment significantly although earnings management is present in firms.

Aligned with Polk and Sapienza's (2009) argument, there is evidence that firms in this economy especially with TBQ<1 pursue 'catering channel' to increase inefficient investment. In fact, the investment in this economy is still dominated by inefficient investment. From models 1 to 4, discretionary accruals and dummy for negative stock returns (DAC*DCAR), which represent earnings management and share overpricing, consistently show a positive relationship with investment. Further investigation shows that the findings are dominated by inefficient investment (TBQ<1) as shown in model 4. In model 4, when firms value is low (TBQ<1), a 1 per cent increase in discretionary accruals with negative stock returns (DAC*DCAR) lead to an additional 3.6 per cent in inefficient investment. In contrast, in model 5, when we selected only firms with TBQ>1, the coefficient turned negative. A 1 per cent increase in discretionary accruals when stock is over-priced (DAC*DCAR), the firm's investment is reduced by 11.9 per cent. The findings imply that earnings management does not appear to be a mechanism to expropriate shareholders' value in more efficient firms.

LGDEBT is found to significantly enhance inefficient investment in firms with TBQ<1 in model 4. However, its role has become insignificant for investment in firms with TBQ>1. The cash flows in firms are found to positively and significantly explain firms' investment. Controlling for year effects in model 5 with TBQ<1, and comparing it to the findings in table 5, with the exception of year 2003, the magnitude of earnings management corresponds well to the level of investments in other years.

5. Conclusions

This paper proves that insiders with controlling interest of more than 36.7 per cent have information asymmetry advantage and indulge in earnings management. In contrast to Claessens *et.al.* (2003), they are found to be risk-adverse rather than increase inefficient investment that escalates their risk exposure. Although firms in high concentration industries accelerate information asymmetry, they do not engage in earnings management and subsequently increase investment. The reason may be due to less competitive industries in Malaysia are mainly a result of the number of licenses issued by the government, which has created barriers to new competitors. Therefore, additional investment to protect their business interest is unnecessary. The paper concludes that investment in Malaysia is dominated by inefficient investment. Through earnings management which inflates stock prices, firms increase investment at the expense of external shareholders as stock returns diminish before they realie the actual value of firms' performance.

This paper highlights that earnings management acts as one of the mechanisms to misappropriate shareholders' value. Evidently, information asymmetry is the precondition to earnings management. Although the standard GAAP allows firms to manage accrual accounting, it has been misappropriated to inflate performance and share price, especially when information asymmetry is severe. Earnings management as such can lead to inefficient

investment and distort financial market liquidity. Therefore, it is essential that the law to protect minority shareholders is enforced strictly to reduce unscrupulous earnings management practices that lead to inefficient investment.

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