公司規模及多角化交互作用下對盈餘管理及市場評價的影響

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摘要

文獻上詮釋公司規模或多角化對盈餘管理的關係存在兩個對立的假說，分別是資訊不對稱假說和應計數抵銷假說。本研究則進一步探討兩者交互作用對盈餘管理與市場評價的影響。研究結果除了驗證公司規模或多角化對盈餘管理的關係分別與資訊不對稱和應計數抵銷假說一致外，也發現當公司規模愈小，兩者交互作用下，資訊不對稱假說扮演較重要的角色。此外本研究也發現「大規模且多角化」的公司，較不會操弄盈餘管理，同時也產生正面的市場評價。有鑑於此，本研究亦透過因果關係檢定後發現唯有同時考量公司規模與多角化的交互效果才能完整的詮釋對盈餘管理與公司價值的影響。

關鍵字:盈餘管理、公司規模、多角化

Cross-effects of Size and Diversification on Earnings Management and Tobin's Q

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ABSTRACT

According to previous studies, two competing hypotheses exist in explaining the relation between size and diversification and earnings management, namely, the "information asymmetry hypothesis" and the "offsetting accrual hypothesis." In the current paper, we discuss the cross effects of size and diversification on earnings management and market valuation. The effect of size or diversification on earnings management is consistent with the "information asymmetry hypothesis" and the "offsetting accrual hypothesis." In addition, when combining the cross effects of size and diversification, the "information asymmetry hypothesis" apparently dominates the "offsetting accrual hypothesis." Still further, "diversified and big" firms are less likely to manipulate accounting earnings and acquiring positive valuation from the market. Hence, we use the Granger causality test to prove that the explanation of the association between earnings management and market valuation can only be determined by combining the cross effects size and diversification.

Key words: Earnings management; Size; Diversification

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1. Introduction

Accounting scandals have recently made news throughout the world, such as Enron and World.com, making the issue of earnings management a topic of wide concern. Schipper (1989) defined earnings management as "a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain." For example, managers cater to the expectation of the market and increase earnings in order to acquire bonus or remuneration. In addition, they recognize a great amount of loss when the company is in a poor condition; thus, they reduce the threshold for the next year. However, no matter what the managers do, income-increasing or decreasing, they both inevitably affect investors' evaluation of the firm (Fernandes & Ferreira, 2007).

Why does the topic "earnings management" draw considerable attention? Through the years, the directions and goals of earnings management have been changing. Early studies have focused more on external purpose. For example, Teoh, Welch, and Wong (1998) discuss earnings management and long-run market performance of initial public offerings. Jones (1991) discusses the degree of earnings management during import relief (e.g., tariff increases and quota reduction). Recently, numerous studies have focused on the internal factors of a company. For example, Lee and Choi (2002) evaluate the relation among company size, auditor type, and earnings management. Klein (2002) examine whether or not audit committee and board characteristics are related to earnings management by the firm. Jiraporn, Kim, and Mathur (2008) explore whether corporate diversification exacerbate or mitigate earnings management. Furthermore, Siregar and Utama (2008) use data from Indonesia as they studied the effect of ownership structure, firm size, and corporate governance practices on different types of earnings management.

As the previous studies suggest, numerous factors might affect the degree of earnings management and the value of a firm, such as leverage, profitability, corporate governance, and so forth (e.g., Bartov, Gul, & Tsui, 2001; Fernandes & Ferreira, 2007; Jiraporn, Kim, & Mathur, 2008; Klein, 2002; Lee & Choi, 2002; Lim, Thong, & Ding, 2008; Siregar & Utama, 2008). Among these, size and diversification are discussed extensively; however, they still remain inconclusive.

Diversification is defined both narrowly and broadly. As Villalonga (2004) points out, SFAS 14[1] defines a segment as "a component of an enterprise engaged in providing a product or service or a group of related product and services primarily to unaffiliated customers for a profit." Furthermore, Ramanujam and Varadarajan (1989) define diversification as "the entry of a firm or business unit into new lines of activity, either by process of internal business development or acquisition, which entails changes in its administrative structure, system, and other management processes." Lim, Thong, and Ding (2008) use three methods to measure the degree of diversification, namely, the number of segments in a corporation, Herfindahl index (HI) from sales, and diversification dummy. All these measurements are narrow definitions of diversification. In the current study, we selected all of the three narrow definitions to analyze the diversification of a company. Thus, we would like to clarify that in this work, "segment" is used instead of "subsidiary" for diversification.

In terms of the relationship between size and earnings management or market valuation, both directions are possible. The information asymmetry hypothesis argues that information for large firms should be more available in the market than for small firms (Siregar & Utama, 2008). Lee and Choi (2002) state that small companies tend

[1] A formal document issued by the Financial Accounting Standards Board (FASB), which details accounting standards and guidance on selected accounting policies set out by the FASB. The standards are created to ensure a higher level of corporate transparency.

to manage earnings more frequently to avoid losses than large companies do, thus implying a negative relation. On the contrary, Moses (1987) argues that large firms have a bigger incentive to achieve smooth earnings than small firms. Michelson, Wagner, and Wootton (1995) also find consistent evidence, thus proving a positive relation. In terms of size and market valuation, size effect, which is the most prevalent theory proposed by Fama and French (1992), argues that investors demand higher return due to the higher risks of smaller firms. However, the theory is still subject to counter arguments and debates. Fernandes and Ferreira (2007) find a significantly negative relation between size and Tobin's Q (hereafter, Q), whereas Moses (1987) proves that size and Q are positively correlated. Thus, both directions between size and market valuation are possible.

On the other hand, Jiraporn, Kim, and Mathur (2008) propose two opposing hypotheses to explain the relationship between earnings management and diversification. The information asymmetry hypothesis argues that from the investors' perspective, corporate diversification might add complexity and it might be easier for managers to arbitrarily adjust the accounting earnings. Thus, the degree of diversification is positivly correlated with earnings management. The aforementioned hypothesis asserts that on one hand, diversification exacerbates earnings management; on the other hand, offsetting accrual hypothesis argues that the more segments a firm has, the smaller the amount of accruals originated from each segment is. Several accruals are negative, whereas others might be positive; causing them to be prone to offset with each other. Hence, offsetting accrual hypothesis suggests that diversification mitigates earnings management. In the present study, we examined which hypothesis is supported when the effect of diversification on earnings management is considered alone as well as which hypothesis might dominate another when the other key element—size—is added. Morck and Yeung (1998) propose the theory of synergy, indicating that the benefits of synergy come from the existence of valuable information-based assets within the firm. According to Yost (2002), global diversification enhances shareholder value by exploiting firm-specific assets, by increasing operating flexibility and satisfying investor preferences for holding globally diversified portfolios. Aggarwal and Samwick (2003) also report that the advantage of diversification outweighs its drawback. Villalonga (2004) use a new database (Business Information Tracking Series) and finds the diversification premium which is robust to variation in the sample, business unit definition, and measures of excess value and diversification. However, earlier studies, such as Lang and Stulz (1994), find that Q and firm diversification are negatively related because of diversification discount, that is, firms operate with less efficiency. Berger and Ofek (1995) claim that diversified firms trade at a discount relative to single segment firms in the same industries. This phenomenon might be attributed to agency cost for outside investors. Therefore, the relation between diversification and market valuation is still inconclusive.

Lang and Stulz (1994) show positive relation between size and diversification. Research on the cross effects of size and diversification on earnings management and the value from market are currently insufficient. As mentioned previously, we would like to explore which hypothesis (information asymmetry or offsetting accrual) and theory (diversification discount or premium) would play a more important role than the other when two key elements—size and diversification—are simultaneously considered.

A number of studies discuss the relation between earnings management and the value of the firm. One study draws a conclusion that the actual impact of earnings management on stock market valuation is unclear because discretionary accruals (DAs) improve the ability of earnings to reflect economic value. However, DAs are also seen as opportunistic distortions of earnings and are value irrelevant, because they are priced by an inefficient market or unpriced in an efficient market (Cormier & Martinez, 2006). Mao and Jhuo (2011) claim that earnings management and value of firm are interplayed or have endogenous relationship. Earnings management and the value of firm are positively correlated, which means that as the earnings go up, the firm value increases as well. In contrast, Fernandes and Ferreira (2007) argue that firms with lower levels of earnings management have higher valuations as measured by Q. Earnings management also has an impact on firm valuation, which increases over time.

The previous studies shown in **Figure 1** separately discuss the relationship or the two variables that affect the degree of earnings management and firm valuation. Apparently, both signs are possible for each study. Given that size and diversification are correlated with each other, exploring only their effects is insufficient. Previous studies might point out either positive or negative relation between these two variables and earnings management and Q. However, such results might be biased or distorted due to the failure to consider another key variable. Further questions addressed in the current study are as follows: Why do firms with different characteristics receive different market valuations? Does earnings management assume a crucial role? Under which condition could earnings management be reasonably explained when discussing the aforementioned relationships?

Figure 2 presents the main purpose of the current study. Here, we use a broader perspective to examine the whole picture of size, diversification, earnings management, and market valuation. To offer a complete concept of earnings management, these elements are linked together.

The remainder of this paper is organized in sections. Section 2 explains the methodology, including the sample selection, definition of key variables and model. Section 3 presents the empirical results and findings. Section 4 describes the robustness check for the present research. Finally, Section 5 provides the summaries and conclusions.

2. Methodology

2.1. Sample selection

Data from the original sample, the bull market, were collected from the Compustat Industry Segment from years 2003 to 2007. As Jiraporn, Kim, and Mathur (2008) mentioned, the relatively strong market potentially adds extra incentives for managers to conduct earnings management, due to stock compensation. Moreover, using DAs to manipulate reported earnings is more pronounced at firm, where the CEO's potential total compensation is more closely tied to the value of stock and option holdings (Bergstresser & Philippon, 2006). Cheng and Warfield (2005) prove that equity incentives lead to incentives for earnings management.

The main stock exchanges in United State are NASDAQ, NYSE, and AMEX. NASDAQ has established itself as an indicator of the performance of stocks of technology companies and growth companies. The data collected from three individual stock exchange websites indicate that NASDAQ has the biggest percentage of technology firms (see **Table 1**). A previous study has shown that investors are periodically overoptimistic as regards the earnings potential of young growth companies (Loughran & Ritter, 1995). As a result, issuers can report unusually high earnings by adopting discretionary accounting accruals adjustments that raise reported earnings relative to actual cash flows (Teoh, Welch, & Wong, 1998). In addition, considering the sales, inventory and profits, technology-oriented firms are more susceptible to economic and business cycle. Furthermore, the bonus and remuneration of managers enormously fluctuate due to the final results of financial statements. We speculate that this property gives managers relatively strong incentives to manipulate the discretionary earnings. Thus, the current study focuses on NASDAQ.

A total of 2,532 firms were listed in NASDAQ in 2007, the final year of the current study's sample period. These firms could be classified into two groups: the single firm with only one segment, and the diversified firm with two or more segments. According to Jiraporn, Kim and Mathur (2008), the financial industry (SIC codes 6000-6999) and the utility industry (SIC code 4900-4999) are excluded due to government regulations. Moreover, firms with sales less than $20 million or have insufficient information for modified Jones (1991) model are discarded (Berger & Ofek, 1995). The final sample contains 2,735 single firm data and 2,689 diversified firm data on the specified period.

2.2. Definition of key variables

2.2.1. Measurements of earnings management

In order to detect the extent of earnings management, Dechow, Sloan, and Sweeney (1995) arranged five main models and developed the revised model based on that of Jones. The respective methods of these five models and their restrictions are discussed as follows. Healy (1985) first adopted accruals as the indicator of earnings management. The total accruals are defiend as the difference between earnings before interest and tax and cash flow from operating activities. The total accruals are divided into two groups, the DAs and the non-discretionary accruals (NDAs). The degree of earnings management is measured by the difference between the total accruals and the NDAs, over the event period. The second model is that of DeAngelo (1986). Both the Healy and the DeAngelo Models use total accruals from the estimation period to proxy for expected NDAs. However, the NDAs might affect the detecting power of earnings management. Thus, DeAngelo modified Healy's model by restricting the estimation period to the previous year's observation. If NDAs are constant over time and DAs have a mean of zero in the estimation period, then both the Healy and

DeAngelo Models can measure NDAs without error. If, however, the NDAs change from one period to another, then both models will tend to inaccurately measure these (Dechow, Sloan, & Sweeney, 1995). The third model, i.e., the Jones Model (1991) relaxes the assumption proposed by Healy and DeAngelo that NDAs are constant. Instead, Jones claims that these might change because of external environment factors. The Jones Model assumes that revenues are non-discretionary, which might cause the estimate of earnings management to be biased. The fourth, the Industry Model (1991), which also relaxes the assumption of constant NDAs and considers their variation as the reflections of industrial environment. Thus, the Industry Model assumes that variation in the determinants of NDAs are common across firms in the same industry (Dechow, Sloan, & Sweeney, 1995). Finally, the previous Jones Model failed to include the effect of credit sales, which might be manipulated by managers. The modified Jones Model (1995) implicity assumes that all changes in credit sales in the event period result from earnings management. This assumption is based on the reasoning that the difficulty of managing earnings is reduced by exercising discretion over the recognition of revenue on cash sales (Dechow, Sloan, & Sweeney, 1995). This last model solves several of the previous models' restrictions. Thus, the current study has adopted the modified Jones Model to estimate the DAs and consider them as proxies for earnings management. Bartov, Gul, and Tsui (2001) find that only the modified Jones Model consistently detects earnings management. Furthermore, this methodology has been recently used in numerous studies (e.g., Jiraporn, Kim, & Mathur, 2008; Lim, Thong, & Ding, 2008; Mao & Jhuo, 2011).

2.2.2. The measurements of diversification

Following Lim, Thong and Ding (2008), we used three measurements of diversification. The first measurement was conducted using a diversification dummy, where a dummy equals zero if there is only one segment and equals one if there are more than two segments. As defined by SFAS 14, a segment is "a component of an enterprise engaged in providing a product or service or a group of related products and services primarily to unaffiliated customers (i.e., customers outside the enterprise) for a profit.'' In the second measurement, we used the inverse of the Herfindahl Index[2], which is a continuous measure that takes higher values with higher level of diversification. This is a standard method in the strategy and economics literature on diversification (Villalonga, 2004). We computed the sum of squares of each segment's sales to total sales of the company, after which the inverse of its value was used to easily judge its degree of diversification (i.e., the index equals one for single-segment firm and is larger than one for multi-segments firms). Hence, the larger number indicates the higher level of diversification. The third measurement involves the number of segments engaged in a company. We collected the segment data from COMPUSTAT database. Similarly, the greater number signifies a higher level of diversification.

2.2.3 Q

When accessing the firm performance, previous studies have used accounting numbers or stock market return. As Lang and Stulz (1994) point out, this "ex post" methods suffer from two problems, namely, the choice of benchmark for comparisons, which might cause different resluts and the use of adjustment of stock returns for risk. If the risk is not adjusted, a number of firms would perform better, simply because they can bear greater risk. Such phenomenon might distort the evaluation of firm performance. Q, on the other hand, avoids the disadvantages of ex post method

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[2] $HI = \sum \left(\frac{SegSale}{Sales}\right)^2$

because it measures firm performance at a point in time that does not require risk adjustment. Furthermore, Q also contains the capitalized value of the benefits from diversification (Lang & Stulz, 1994).

Similar to Lang and Stulz (1994), Villalonga (2004), and Fernandes and Ferreira (2007), we defined Q as the market value of common equity, plus total assets, minus the book value of common equity, divided by total assets.

2.3. Model

To capture the extent of earnings management, whether it is upward or downward, the absolute value of DAs combined the effect of income-increasing and income-decreasing (Jiraporn, Kim, & Mathur, 2008). Several studies also adopt the absolute value of DAs as the proxies of earnings management (e.g., Bartov, Gul, & Tsui, 2001; Klein, 2002). To examine the relation between size and diversification, and their cross effects on earnings management and Q, we adopted the following cross-sectional regressions:

Abs(DA)=f(SIZE, DIVERSIFICATION, SIZE×DIVERSIFICATION, LEVERAGE,
ROA, GROWTH, CASH),

Q= f(SIZE, DIVERSIFICATION, SIZE×DIVERSIFICATION, LEVERAGE, ROA,
GROWTH, CASH),

where Abs(DA) = absolute DA, with DA estimated by the modified Jones (1995) model; SIZE is the nature logarithm of total assets in a year; DIVERSIFICATION, with three measurements: SEG or the number of segment offered by COMPUSTAT, 1/HI or the inverse of Herfidahl index, and DUMMY, with the variable equals one if the firm operates in multiple segments, and zero otherwise; and SIZE × DIVERSIFICATION as the grouping dummy variables for distinguishing four groups by number of segment and firm size. Based on **Figure 3,** a company can be classified as follows: (a) “Single Small,” with a size smaller than the sample medium and has only one segment; (b) “Diversified Small,” with a size smaller than the sample medium but has more than one segment; (c) “Single Big,” with a size larger than sample medium and has only one segment; and (d) “Diversified Big,” with a size larger than the sample medium and has more than one segment. We also employed a few control variables, as suggested by previous studies (e.g., Cormier & Martinez, 2006; Fernandes & Ferreira, 2007; Jiraporn, Kim, & Mathur, 2008; Lim, Thong, & Ding, 2008; Siregar & Utama, 2008). In addition, LEVERAGE refers to the ratio of debt to total assets, ROA is the proxy of profitability, GROWTH indicates the annual sales growth rate, and CASH is computed as cash plus cash equivalent divided by total assets.

3. Empirical Results

The summary statistics are shown in **Table 2**. As can be seen, the mean value of DAs is negative, suggesting that the degree of income-decreasing earnings management is more than income-increasing during the recent sample period. On average, there are 3.09 segments within a firm, and the inverse of HI is 1.43. The mean and medium values for ROA, an indicator for profitability, are 22.34% and 4.48%, respectively. The standard deviation is 2.75%, indicating the presence of a number of relative high-performance firms. Such result is primarily due to the higher proportion of technology and growth firms in NASDAQ. **Table 3** presents selected features of the sample firms and the t-test for the two subsamples, single and diversified. In terms of size, the diversified firms are significantly larger than the single firms. The leverage ratio of the diversified firms (46%) is significantly higher than that of the single firms (42%). Moreover, the diversified firms have lower cash holding (20%) than single firms (25%). These results are consistent with those presented in Jiraporn, Kim, and Mathur (2008). Moreover, no significant difference is found between the Abs(DA) of single and diversified firms. The t-test used the mean to determine any significantly difference; however, to check the difference using Wilcoxon-Mann-Whitney test, which adopts medium in order to avoid the impact of extreme values, is a more conservative method. **Table 4** shows that diversified firms have statistically significant lower Abs(DA) than single firms at 10% level, implying that diversified firms are less likely implementing earnings management. This result is consistent with Jiraporn, Kim, and Mathur (2008).

Table 5 presents the Pearson correlations among Q, Abs(DA), and the independent and other control variables. The correlation between LEVERAGE and Abs(DA) are significantly positive, which is consistent with Smith and Stulz (1985) who argue that highly leveraged firms are sometimes known to reduce their debt-financing costs by recording greater income increasing accruals, thereby reducing creditors' perception of firm risk. The positive correlation between CASH or GROWTH and Q reveals that cash-rich firms and those with higher growth rates have significantly higher market valuation due to safety concern and future prospect. This result is consistent with that of Fernandes and Ferreira (2007). Furthermore, the correlation coefficients between independent variables and control variables are less than 0.4, except for the proxies of diversification (i.e., number of segment and 1/HI) and VIFs are less than 10, proving the absence of any collinear problem.

Table 6 displays the multivariate regression results, where the dependent variable is the absolute value of DA. Model 1 shows that the coefficient for size is negative and significant at the 1% level, indicating that the increase in size reduces earnings management. This result is in favor of the information asymmetry hypothesis which is consistent with Lee and Choi (2002), Jiraporn, Kim, and Mathur (2008), and Cormier and Martinez (2006). Model 2, Model 3, and Model 4 seperately presents three different measurements of diversification and their signs. Model 2 uses the inverse of Herfindahl Index. The coefficient for this variable is negative and significant at the 1% level, implying that average earnings management decreases as the degree of diversification increases. Model 3 uses the number of segments in a company as the proxy of diversification. The coefficient is negative but not statistically significant. Model 4 includes the dummy variable. The dummy variable is equal to 1 if the firm has more than one segment, and is 0 otherwise. The coefficient for this dummy variable is negative but not statistically significant. This evidence is in support of the offsetting accrual hypothesis.

In summary, the empirical results show both negative asscociation between size and diversificaiton on earnings management. Siregar and Utama (2008) point out, information for large firms should be more available in the market than for small firms. Similarly, we find the lower degree of earnings management for the larger firms as consistent with Lee and Choi (2002), which also supports information asymmetry hypothesis. Jiraporn, Kim, and Mathur (2008) states that firms operate in different industries are likely to derive cash flows that are not perfectly correlated. Therefore, the managers might encounter difficulties in managing earnings in either direction, as the accruals in different units tend to offset each other. We find the consistent result with Jiraporn, Kim and Mathur (2008), indicating that diversification lowers the degree of earnings management, thereby providing support to the offsetting accrual hypothesis.

Table 7 not only shows the effect of size or diversification on earnings management but also combines the cross effects of these two key variables. In Model 3, three dummy variables are included that distinguish among "Diversified Big" (Intercept), "Single Small," "Single Big," and "Diversified Small." The coefficient for "Diversified Big" is negative, whereas that for "Single Small" is positive. Both coefficients are at the 1% level of statistical significance. This result is consistent with Models 1 and 2, presenting both negative sign between size and diversification on earnings management. Hence, earnings management is reduced by 2.3% on average when the type of firm is diversified and big, and is increased by 5% on average when the firm is small and single. In addition, the coefficient for the "Diversified Small" firm is positive at 1% level of statistical significance, which directly points out that this type of firm has positive earnings management. Both the "Diversified Small" and "Single Small" firms have significant positive effects on earnings management. As long as the firm has a small size, it is more likely to perform earnings management.

Thus, size effect apparently dominates diversification effect.

In summary, when effects of size and diversification are combined, the size of a firm assumes a more important role than diversification. Thus, the information asymmetry hypothesis dominates the offsetting accrual hypothesis.

Table 8 shows the multivariate regression results, where Q is the dependent variable is. Models 4 and 5 present the relation between size and diversification with Q, with the coefficients 0.006 and -0.007, respectively. However, the results are not statistically significant, indicating the absence of any persuasive evidence when their relationships are separately discussed. Meanwhile, Model 6 combines the cross effects of size and diversification. Three dummy variables are included, namely, “Diversified Big” (Intercept), “Single Small,” “Single Big,” and “Diversified Small.” The coefficients for each sample are all positive. However, only the “Diversified Big” and “Single Small” firms showed statistical significance at the 1% significant level, indicating that only these two types of firms gain significant positive valuation from the market during the sample period.

In conclusion, the market provides similar feedback but different expectations to different types of firms. Smaller firms should focus on one segment, and those categorized as big-sized firms should expand their businesses and develop new lines of segment. Hence, the “synergy effect hypothesis” is supported.

4. Robustness check

Table 7 and **Table 8** demonstrate the cross effects of size and diversification on Abs(DA) and Q. After grouping the firms by size and number of segments, only the "Diversified Big" type of firms obtained statistically significant coefficients, indicating that this type of firm is positively correlated with market valuation and negatively correlated with earnings management. Thus, for this type of firm, the relation between earnings management and Q can be confirmed with a robustness check. To examine the relation between Abs(DA) and Q, we adopted regression, following Cormier and Martinez (2006) and Mao and Jhuo (2011):

Q= f(Abs(DA), CASH, NDA),

where CASH means cash flow per share. **Table 9** displays the multivariate regression results. The coefficient for Abs(DA) is negative and statistically significant at 10% level, revealing that more earnings management decreases market valuation.

Next, we want to verify if less earnings management gain the higher market valuation or if the contrary is true. To verify this issue, we then used the Granger causality test (results are shown in **Table 10**). In Panel A, we tested whether the Abs(DA) is the cause for Q. The p-values for Test 1 and Test 2 are both statistically significant at the 1% significance level, indicating that the null hypothesis that Abs(DA) does not cause Q is rejected. Thus, the Abs(DA) is a primary contributor to Q. Similarly, in Panel B, we tested whether Q is the cause for Abs(DA). Both p-values for Tests 1 and 2 are close to zero, and are statistically significant at the 1% significance level. Hence, the null hypothesis that Q does not cause Abs(DA) is also rejected. Therefore, Q is also a primary contributor to Abs(DA). In conclusion, based on Panels A and B, since Abs(DA) causes Q and vice versa, a Granger cause relation is evident between them.

According to Fernandes and Ferreira (2007), earnings management is associated with negative valuation effect. Less earnings management mitigates the information asymmetry between insiders and investors, and as a consequence, a positive valuation is apparent from the market. The recent research made a further step by combining both the effect of size and diversification. A negative relation between earnings management and Q is also shown. Moreover, we found the Granger cause relation between earnings management and Q under condition that firm type is big and diversified.

In summary, after combining size and diversification, the "Diversified Big" type of firms are less likely to perform earnings management and are more likely to gain positive market valuation. Due to the lower information asymmetry and offsetting accrual effect, "Diversified Big" firms encounter difficulty in manipulating accounting earnings, thereby gaining higher market valuation. On the contrary, the manager might respond to the market, with a lower level of earnings management as the feedback of higher valuation.

5. Conclusion

The current study provides evidence that the effect of size or diversification on earnings management is consistent with information asymmetry hypothesis and offsetting accrual hypothesis, separately. Apart from other research, we demonstrate further that information asymmetry hypothesis dominates offsetting accrual hypothesis on the cross effects of size and diversification. We also demonstrate that a diversified firm has a synergy effect instead of a diversification discount, as long as its size is big enough. Hence, examining the association between diversification and market valuation alone is insufficient. Another key element (i.e., size) should also be included to understand the whole concept.

Is earnings management really necessary when discussing the relation between firm characteristics and market valuation? The recent research finds a negative relationship between earnings management and Tobin's Q, proving that investors are not in favor of earnings management. Due to information availability and accrual offsetting effect, "Diversified Big" firms are less likely to conduct earnings management. Using the Granger cause relation, the lower level of earning management of such firms can be greatly attributed to higher market valuation.

Our study contributes to the literature in earnings management by demonstrating that it is necessary to combine size and diversification when studying earnings management and market valuation. In addition, we also link firm characteristics, Abs(DA) and Q, demonstrating that such firms receive positive market valuation due to less earnings management.

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Table 1. Number and percentage of company in each industry among three main stock exchanges.

Stock Exchange	NASDAQ		NYSE		AMEX		ALL	
Statistic	No.	%	No.	%	No.	%	No.	%
Basic Industries	78	2.77	191	5.89	74	14.02	343	5.21
Capital Goods	202	7.18	186	5.73	31	5.87	419	6.36
Consumer Durables	253	8.99	104	3.21	31	5.87	388	5.89
Consumer Non-Durables	124	4.40	122	3.76	22	4.17	268	4.07
Consumer Services	345	12.26	413	12.73	45	8.52	803	12.19
Energy	103	3.66	213	6.57	39	7.39	355	5.39
Finance	600	21.31	468	14.43	25	4.73	1,093	16.59
Health Care	232	8.24	88	2.71	30	5.68	350	5.31
Miscellaneous	87	3.09	47	1.45	4	0.76	138	2.10
Public Utilities	89	3.16	225	6.94	11	2.08	325	4.93
Technology	514	18.26	142	4.38	29	5.49	685	10.40
Transportation	57	2.02	59	1.82	0	0.00	116	1.76
N/A	131	4.65	986	30.39	187	35.42	1,304	19.80
TOTAL	2,815	100	3,244	100	528	100	6,587	100

Table 2. Descriptive statistics.

Descriptive statistics on variables for our sample of firms from 2003-2007 Compustat sample of Nasdaq Exchange firms. Q stands for Tobin's Q and its numerator is computed as book value of total assets and the market value of equity; the denominator is total assets. The discretionary accruals are estimated based on the modified Jones model (1995). Abs(DA) represents the unsigned absolute values of the discretionary accruals. The SEGMENT is the number of segment in a company collected from Compustat. 1/HI is the inverse value of Herfindahl Index which is computed based on revenues generated from different segments in a firm. Total assets are in millions and SIZE is the logarithm value of total assets. LEVERAGE is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability. GROWTH is defined as the annual sales growth rate. CASH is computed as cash plus cash equivalent divided by total assets.

N=5,424	Minimum	Maximum	Mean	Medium	S.D
Q	0.33	20.67	2.22	1.77	1.52
DA	-2.25	11.24	-5.2E	0.01	0.21
Abs(DA)	3.93E	11.24	0.07	0.04	0.20
SEGMENT	1	20	3.09	1	2.90
1/HI	1	6.27	1.43	1	0.74
SIZE	1.51	12.51	5.73	5.62	1.52
LEVERAGE	0.03	7.71	0.44	0.40	0.29
ROA	-278.36	1100	22.34	4.48	2.75
GROWTH	-0.84	23.34	0.17	0.12	0.42
CASH	0	0.97	0.23	0.17	0.21

Table 3. t-test for mean of two subsamples.

Single stands for company with only one segment; diversified for more than two segments. Total assets are in millions and SIZE is the logarithm value of total assets. The SEGMENT is the number of segment in a company collected from Compustat. 1/HI is the inverse value of Herfindahl Index which is computed based on revenues generated from different segments in a firm. LEVERAGE is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability. GROWTH is defined as the annual sales growth rate. CASH is computed as cash plus cash equivalent divided by total assets.

	Single	Diversified	t-statistics	Full Sample
Abs(DA)	0.07	0.07	0.31	0.07
SIZE	5.55	5.92	9.01***	5.73
SEGMENT	1	5.21	77.13***	3.08
1/HI	1	1.87	52.42***	1.23
LEVERAGE	0.42	0.46	4.71***	0.44
ROA	2.44	3.06	1.02	2.73
GROWTH	0.17	0.17	0.59	0.17
CASH	0.25	0.20	-9.79***	0.23
N	2,735	2,689	-	5,424

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

Table 4. Wilcoxon-Mann-Whitney test for medium of two subsamples.

Single stands for company with only one segment; diversified for more than two segments. Total assets are in millions and SIZE is the logarithm value of total assets. The SEGMENT is the number of segment in a company collected from Compustat. 1/HI is the inverse value of Herfindahl Index which is computed based on revenues generated from different segments in a firm. LEVERAGE is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability. GROWTH is defined as the annual sales growth rate. CASH is computed as cash plus cash equivalent divided by total assets.

	Single	Diversified	M-W test	Full Sample
Abs(DA)	0.04	0.04	-1.61*	0.04
SIZE(lnTA)	5.44	5.92	8.62***	5.62
SEGMENT	1	4	68.43***	1
1/HI	1	1.67	60.90***	1
LEVERAGE	0.37	0.43	6.75***	0.40
ROA	4.60	4.30	-1.10	4.48
GROWTH	0.12	0.12	-0.66	0.12
CASH	0.20	0.15	-7.42***	0.17
N	2,735	2,689	-	5,424

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

Table 5. Correlation matrix.

Q stands for Tobin's Q and its numerator is computed as book value of total assets and the market value of equity; the denominator is total assets. The discretionary accruals are estimated based on the modified Jones model (1995). Abs(DA) represents the unsigned absolute values of the discretionary accruals. The SEGMENT is the number of segment in a company collected from Compustat. 1/HI is the inverse value of Herfindahl Index which is computed based on revenues generated from different segments in a firm. Total assets are in millions and SIZE is the logarithm value of total assets. LEVERAGE is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability. GROWTH is defined as the annual sales growth rate. CASH is computed as cash plus cash equivalent divided by total assets.

	1	2	3	4	5	6	7	8	9
1.Q	1.00								
2.Abs(DA)	-0.0143	1.00							
3.SEG	-0.066***	-0.003	1.00						
4.1/HI	-0.031**	-0.013	0.685***	1.00					
5.SIZE	0.019	-0.065***	0.276***	0.184***	1.00				
6.LEVERAGE	-0.112	0.095***	0.076***	0.058***	0.112***	1.00			
7.ROA	0.139	0.471***	0.003	0.029**	0.096***	-0.117***	1.00		
8.GROWTH	0.151***	-0.018	0.058***	-0.001	0.070***	-0.037***	0.087***	1.00	
9.CASH	0.374***	-0.01	-0.101***	-0.094***	-0.046***	-0.342***	-0.013	0.034**	1.00

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

Table 6. Regressions of Abs(DA) on of size and three measurements of diversification and controls.

Total assets are in millions and SIZE is the logarithm value of total assets. 1/HI is the inverse value of Herfindahl Index which is computed based on revenues generated from different segments in a firm. The SEG is the number of segment in a company collected from Compustat. DUMMY equals zero for single company, one for diversified one. LEVERAGE is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability. GROWTH is defined as the annual sales growth rate. CASH is computed as cash plus cash equivalent divided by total assets.

	Model 1	Model 2	Model 3	Model 4
Intercept	0.092***	0.019**	-0.052***	0.107***
SIZE	-0.017***	-		
DIV(1/HI)	-	-0.008***		
DIV(SEG)			-0.001	
DIV(DUMMY)				-0.03
LEVERAGE	0.124***	0.113***	0.207***	0.124***
ROA	0.004***	0.004***	0.001***	0.004***
GROWTH	-0.022***	-0.059***	-0.019***	-0.022***
CASH	0.053***	0.012***	0.091***	0.05***
N	5,424	5,424	5,424	5,424
F-statistics	395.10***	371.59***	599.45***	282.79***
Adjusted R^2	0.2665	0.2553	0.5268	0.2667

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

Table 7. Regression of Abs(DA) on cross-effects of size and diversification and controls.

Total assets are in millions and SIZE is the logarithm value of total assets. 1/HI is the inverse value of Herfindahl Index which is computed based on revenues generated from different segments in a firm. LEVERAGE is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability. GROWTH is defined as the annual sales growth rate. CASH is computed as cash plus cash equivalent divided by total asset

	Model 1	Model 2	Model 3 (Grouping)
Intercept	0.092***	0.019**	-0.023***
SIZE	-0.017***	-	-
Div(1/HI)	-	-0.008***	-
Single Small	-	-	0.050***
Single Big	-	-	0.009
Diversified Small	-	-	0.039***
LEVERAGE	0.124***	0.113***	0.123***
ROA	0.004***	0.004***	0.004***
GROWTH	-0.022***	-0.059***	-0.057***
CASH	0.053***	0.012***	0.051***
N	5,424	5,424	5,424
F-statistics	395.10***	371.59***	279.31***
Adjusted R^2	0.2665	0.2553	0.2649

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

Table 8. Regression of Tobin's Q on cross-effects of size and diversification and controls.

Total assets are in millions and SIZE is the logarithm value of total assets. 1/HI is the inverse value of Herfindahl Index which is computed based on revenues generated from different segments in a firm. LEVERAGE is the ratio of debt to total assets. ROA means return on total assets and is the proxy of profitability. GROWTH is defined as the annual sales growth rate. CASH is computed as cash plus cash equivalent divided by total assets.

	Model 4	Model 5	Model 6
Intercept	1.354***	1.292***	1.298***
SIZE	0.006	-	-
Div(1/HI)	-	-0.007	-
Single Small	-	-	0.248***
Single Big	-	-	0.094*
Multi Small	-	-	0.003
LEVERAGE	0.206***	0.233***	0.239***
ROA	0.010***	0.008***	0.010***
GROWTH	0.458***	1.161***	0.466***
CASH	2.808***	2.753***	2.755***
N	5,424	5,424	5,424
F statistics	229.28***	271.01***	168.48***
Adjusted R^2	0.1773	0.2036	0.1812

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

Table 9. Regression of Abs(DA) on Tobin's Q and controls.

Q stands for Tobin's Q and its numerator is computed as book value of total assets and the market value of equity; the denominator is total assets. The discretionary accruals are estimated based on the modified Jones model (1995). Abs(DA) represents the unsigned absolute values of the discretionary accruals. CASH is computed as cash flow per share. NDA is non discretionary accrual, and computed as total accrual minus discretionary accrual.

	Model 9
Intercept	2.938***
Abs(DA)	-0.145*
CASH	-0.002
NDA	12.616***
N	1,345
F-statistics	75.51***
Adjusted R^2	0.041

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

Table 10. Granger-causality test for Abs(DA) and Tobin's Q.

Assume a particular autoregressive lag length p, and estimate the following unrestricted equation by OLS: $Q_t = \alpha_0 + \alpha_1 Q_{t-1} + \alpha_2 Q_{t-2} + \beta_1 Abs(DA)_{t-1} + \beta_2 Abs(DA)_{t-2} + \mu_t$. The null hypothesis is H0:β1=β2=0. Then conduct an F-test of the null hypothesis by estimating the following restricted equation also by OLS: $Q_t = \alpha_0 + \alpha_1 Q_{t-1} + \alpha_2 Q_{t-2} + \varepsilon_t$. Compare their respective sum of squared residuals: $RSS_1 = \sum_{t=1}^{T} \mu_t^2$ and $RSS_0 = \sum_{t=1}^{T} \varepsilon_t^2$. If the test statistic $S_1 = \frac{(RSS_0 - RSS_1)/p}{RSS_1/(T-2p-1)} \sim F_{p,T-2p-1}$ is greater than the specified critical value, and then reject the null hypothesis that Abs(DA) does not Granger-cause Tobin's Q. The similar test has done for Tobin's Q does not Granger-cause Abs(DA).

Panel A H0：Abs(DA) dose not cause Tobin's Q

IML Result	
Test1	p_value1
203.66266	0***
Test2	p_value2
407.82646	0***

Panel B H0：Tobin's Q does not cause Abs (DA)

IML Result	
Test1	p_value1
34.310805	1.665E-15***
Test2	p_value2
68.706036	1.221E-15***

***,**,* statistically significant at the 1%, 5%, and 10% levels, respectively.

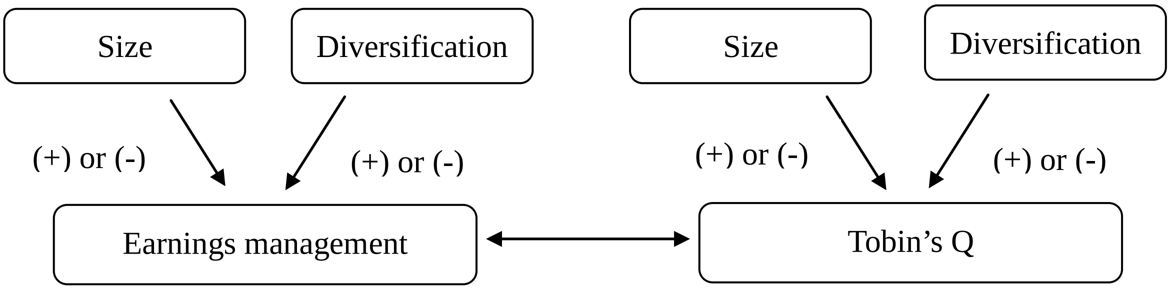

Figure 1. Previous studies

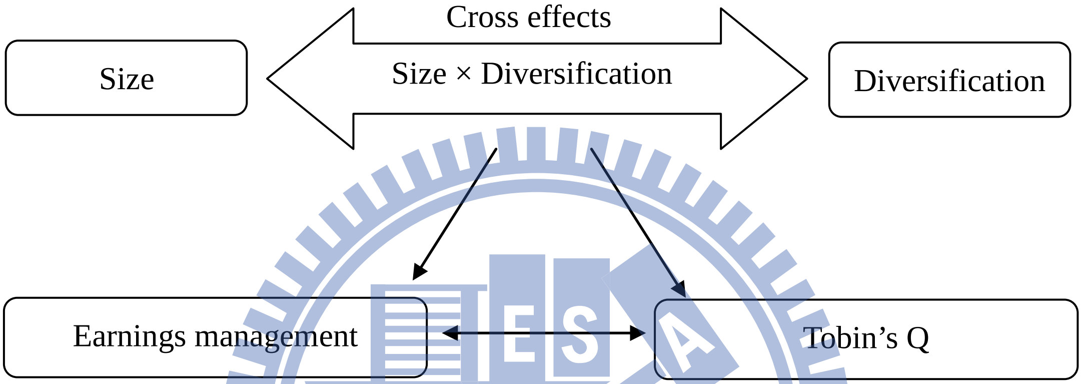

Figure 2. Main purpose of this paper

	Ln(TA)< Medium Small N=2,711	Ln(TA)>Medium Big N=2,713
Number of segment=1 Single N=2,735	(a)"Single Small" N=1,367	(c)"Single Big" N=1,368
Number of segment>1 Diversified N=2,689	(b)"Diversified Small" N=1,344	(d)"Diversified Big" N=1,345

Figure 3. Grouping by Size and Diversification.