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## Growth opportunity and risk: empirical investigation on earnings management decision

### Abstract

This study uses the diverse revolving method to examine corporate characteristics pertaining to high growth opportunities and high risk to investigate whether they affect the management's manipulation of earnings. Our results find that companies with high levels of growth opportunities will frequently use discretionary accrual items to manipulate earnings. When a company faces high risk, it will be inclined to use discretionary accrual items on earnings management. It is documented that while firms with high growth potential face high risk, they will probably adopt a more progressive strategy for earnings.

**Keywords:** growth opportunities, risk, discretionary accruals, earnings management.

**JEL Classification:** G38, M10, M41, M42.

### Introduction

In 2001, the Enron Corporation, one of the top ten corporations in the United States and “the most creative” and “the most growth potential,” company considered by Fortune Magazine, announced that its after-tax net income had been reduced by \$544 million and its shareholders' equity had decreased by \$1.2 billion (Benston and Hartgraves, 2002). These caused a total loss of about \$70 billion in market capitalization (Rezaee, 2005). These losses were caused by incomplete or misleading financial statements. Enron's declaration of bankruptcy because of financial statement fraud had a great impact on the US as well as on the international political and economic community<sup>1</sup>. Cotton (2002) indicated that the case of Enron was just the beginning of a series of incidents of fraud. The reported financial statement fraud caused by the loss of market capitalization of Enron, WorldCom, Qwest, Tyco, and Global Crossing was estimated to be about \$460 billion (Rezaee, 2005). Looking back at the reasons for the failure of these companies, we believe that not only did they experience excessive growth and take excessive risks, but they also had hidden earnings manipulations, which caused operations to spiral out of control.

However, pursuing growth is always one of the major goals of management. Tilles (1963) indicated that many managers have the mindset of kindergarten

children; when asked about the future size of their respective companies, the consistent answer has always been: “bigger”. However, being “bigger” does not always bring enormous profits for the company. If the return on investment (ROI) is smaller than the investment cost, then the investment reduces the wealth of stockholders. Even though increasing sales or assets can improve wealth, it does not necessarily guarantee enhancement of the company's value (Ramezani et al., 2002). The common characteristic of these cases of fraud is that the companies continuously pursue neglecting the fact that such growth can put them in much greater risk. In these cases of fraud, most people believe that dishonest financial practices and inconsistent reports are the substance of the problem, especially false declaration of earnings and reduction of liabilities. Therefore, regulation and discipline are obviously inadequate, causing the internal controls to break down and internal and external audits to form misstatements. It has also been shown that management lies to investors by using brilliant but untruthful figures to raise a company's market capitalization.

In prior research of earnings management, many studies have discussed the relationship between earnings management and initial public offerings (Teoh, Welch, and Wong, 1998), the avoidance of earnings' decreases and losses (Burgstahler and Dichev, 1997; Skinner and Sloan, 2001; Matsumoto, 2002), and the introduction of CEO bonus programs and other related items. There are only a limited number of studies investigating firms' investment behavior and earnings management (McNichols and Stubben, 2008; Cohen and Zarowin, 2009).

In addition, there are few studies to examine how future growth opportunities and risk affect earnings management. This paper focuses on a company's characteristics of future growth opportunities and risk to explore the cross-effects of these characteristics with earnings management. Since financial statements are provided for investors, we

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<sup>1</sup> After the Enron incident, the US Government passed the Sarbanes-Oxley Act to restore order in the capital market. In English, “Enron” can be used as a verb, which means “to bluff”.

anticipate that the management tends to manipulate earnings to hide financial distress when a company confronts difficult economic environment.

The rest of the paper is organized as follows. The next section reviews the literature. Section 2 develops the research hypothesis. The sample and research design are described in detail in section 3. Section 4 discusses the summary descriptive statistics and main results of the research. Finally, the paper's conclusions are discussed in final section.

## 1. Literature review of earnings management

The financial statement is very important information to investors. If a manager faithfully conveys the earnings information, this reduces asymmetric information, avoiding fraud. However, when firms have potential investments that will provide growth opportunities for the company, they will certainly face more risks. To this end, managers likely have motivation to manipulate earnings to cosmetically alter the financial statement to hide financial distress. This can mislead investors' judgment. These prior literatures suggest several potential determinants of earnings management in fraud cases. Based on these findings, this paper proposes that earnings management is likely to be induced by excessive growth and risk.

Healy (1985) stated that management can use the discretionary accrual items to influence accounting earnings and to undertake earnings management. Bernard and Skinner (1996) identified two perspectives of the use by management of discretionary accrual items: the opportunistic perspective and the signaling perspective. According to the opportunistic view, management tries to manipulate financial reports to achieve a specific intention. According to the signaling view, management likely improves information by raising accounting figures<sup>1</sup> (Watts and Zimmerman, 1986; Healy and Palepu, 1993). Healy and Wahlen (1999) stated that "earnings management occurs when managers use judgment in financial reporting and structuring transactions to mislead investor about firm's economic performance and contractual outcomes of reported accounting numbers" (Schipper, 1989). Dechow and Skinner (2000) indicated that managers try to obscure or mask true economic performance through the utilization of accounting methods that involve generally accepted accounting principles (GAAP) (Gunny, 2010). Because earnings management is the relevant factor of previous financial fraud cases, no doubt the management's use of discretionary accrual items to manipulate financial

reports is done in order to positively affect the decisions of external users.

The value of a company is assessed based on its future growth opportunities and risks. Because of intense competition, management may be inclined to take higher risks to increase a company's market share and to promote the growth of performance. Myers and Turnbull (1977) stated that companies with more growth opportunities adopt a more conservative strategy in regards to the formulation of financial policies. However, growth opportunities cannot be realized to meet the market's dynamic challenges when the firms do not achieve their target of earnings (Roychowdhury, 2006). The study of McNichols and Stubben (2008) indicated that firms have a potential motivation to manipulate earnings to minimize distortions that occurred in the investment decisions that are simply dependent on the investors' expectations of future growth and product demand.

Further, Cohen and Zarowin (2009 & 2010) found that overinvestment firms or seasoned equity offerings firms actually engage in more earnings management activities. Wongsunwai (2012) also showed that external monitoring, venture capitalist quality, affects firms' earnings management behavior around initial public offerings. Chung (1993) found that when high growth opportunities and high risk existed simultaneously in a company, management tended to increase debt, which caused the company to lose growth opportunities to prevent bankruptcy. The previously mentioned financial statement fraud cases reveal that management did not implement conservative financial strategies. They fraudulently increased revenue figures in the companies' financial reports and dissembled the financial gaps of the company.

## 2. Hypothesis development

**2.1. Growth opportunities and earnings management.** Myers (1977) indicated the value of a company could be determined based on its future growth opportunities. However, companies with high growth opportunities also face more uncertainties, because the future values of a company primarily rely on R&D expenses, advertising and marketing expenses, talent recruitment, training expenses, etcetera. Although these expenses benefit a company's future growth, they are difficult to quantify in the current value of the company.

Skinner and Sloan (2002) suggested that high levels of growth opportunities in a company might generate information asymmetry between the company and investors. Consequently, companies with higher growth opportunities are more likely to manipulate earnings to gain more benefits. Further, Bose and Pal (2012) indicated that firms with higher growth potential are more likely to implement new

<sup>1</sup> Discretionary accrual items are closely entwined with current stock prices, future earnings, and cash flow. Consequently, management has used accrued items to enhance the implications of earnings.

projects. Huang, Chen, and Hsie (2001) found that higher growth opportunities of a company and failure to monitor the actions of the management could increase the inconsistency of information. Therefore, external investors can provide attractive incentive contracts to the management for acquiring information when they were unable to obtain sufficient internal information as well as were deficient in the professional knowledge necessary to understand investment opportunities of the company.

McNichols (2000) indicated that companies will use more accrual items on its earnings for enhancing future growth. The study of McNichols and Stubben (2008) stated that: “*Expectations of future growth are based on information that includes revenues and earnings.*” Consequently, earnings misstatements are likely to influence the expectation of future growth. Jones’ (1991) model demonstrated that the variation in current sales revenues would be enough to capture the changes in the current accrual items<sup>1</sup>. Prior research has compared companies that have lower expectations for future growth based on earnings and other companies that have higher expectations of their growth opportunities in terms of earnings. The research then found that companies with higher expectations for growth opportunities used more discretionary accrual items.

In addition, the management of companies will possibly use discretionary accrual items to manipulate earnings. Barton (2001) also stated that management will use discretionary accrual items to proceed with earnings management as the company has higher growth on its R&D expenses. The study of Richardson, Tuna, and Wu (2002) indicated that growing firms may attempt to report an increase in earnings by restating financial results. As a result, it is possible that management is likely to manipulate earnings for pursuing the growth target. On the other hand, AlNajjar and Riahi-Belkaoui (2001) showed that firms’ growth opportunities affect net income and worth and thus produce political costs and risk. Therefore, firms with high growth opportunities and high risk might use income decreasing accruals.

However, the study of Cohen and Zarowin (2009) focusing on the earnings management on firms’ investment decisions uncovered that firms might have excess investment during the earnings manipulation period. Furthermore, the study of Biddle, Hilary, and Verdi (2009) indicated that investment is an important determinant of growth. From the above discussion, it may be obvious that firms with higher-quality financial reporting can

improve capital investment efficiency and avoid over- or under-investment.

When companies possess a higher growth capital investment plan, their stock prices will usually reflect their current net value. Although the revenue and expenditure of new investment can be expressed in terms of future earnings, accounting evolutions mostly adopt historical costs to estimate the expectations of investors towards a company’s future cash flow. Thus, earnings do not corroborate current stock prices of the company. Consequently, when the capital requirements of a company come with higher growth opportunities, management will be inclined to manipulate earnings and provide private information for the market participants (Bernard and Skinner, 1996). Moreover, market investors also grant a positive evaluation for these companies (Collins and Kothari, 1989). If the evaluation and performance of a company falls below expectations of growth opportunities, it may drop the price of its stocks and bonds, increase loan interest rates, and diminish the quality of business terms from suppliers. Therefore, management has a motive to manipulate earnings by discretionary accrual items in order to keep its higher growth opportunities, as established in Hypothesis 1:

*Hypothesis 1 Ceteris paribus, companies with higher growth opportunities are more inclined to use discretionary accrual items to manipulate earnings.*

**2.2. Risk and earnings management.** The US Securities and Exchange Commission released Financial Reporting Release No. 48 (FRR No. 48), requiring companies to disclose information about the market risk that represents the uncertainties of future results. Business risk will affect the accuracy of predictions and influence such activities as strategy formulation, decision making, and activity planning. This is mainly because of such reasons as the external or internal conditions of a firm’s competing environment and the potential impact to its operation and profit. In addition, financial and operational risks are usually regarded as a function of business risk, which is associated with the uncertainty of operating leverage and financial leverage controlled by the management level. Therefore, management should actively deal with the diverse risk situations in order to maintain the company’s operational efficiency and effectiveness.

As companies pursue higher returns on investment and more growth opportunities, they also face higher risks. Myer and Turnbull (1977) indicated that if the investment plans of a company are excessively risky, the probability of bankruptcy increases. Companies are inclined to reduce excessive investments and adopt more conservative financial leverage policies when they have higher levels of growth opportunities. Jorgensen and Kirschenheiter (2003) found that when a company’s

<sup>1</sup> In reality, every company has different expectations regarding the growth of its earnings, and because of these expectations, they may have different business capital investment decisions. These affect the amount of the discretionary accrual items.

variation of future cash flow is low, management is willing to reveal beneficial information regarding risk. Contrarily, when a company has higher cash-flow variations that inversely increase the risk coefficient, management prefers not to disclose information.

Prior studies have investigated the relation between risks and earnings management. Dhaliwal (1988) used the industry's earning fluctuation as the variable of risk level and Ou, Lee, and Kun (2004) used actual business data to investigate the relationship between business risk and earnings management. A company often uses non-business methods such as buying and selling stock or land for window-dressing earnings. Ou et al. (2004) found that after controlling a company's profitability, business size, and level of external investment, there is a direct relationship between business risk and the degree of earnings management in listed companies of the Taiwan Stock Exchange. Barton (2001) found that management could reduce the company's risk through discretionary accrual items. Burgstahler and Dichev (1997) indicated that management would manipulate earnings by increasing earnings amount on financial reporting when the company's earnings were decreasing. Beidleman (1973) used variation of earnings as a proxy for risk and found that the risk strongly affects investors' decision regarding their investment. Therefore, the management would use discretionary accrual items to

manage earnings when faces higher levels of risk. We have developed hypothesis 2:

*Hypothesis 2: Ceteris paribus, companies with higher levels of risk are more inclined to use more discretionary accrual items to manipulate earnings.*

### 3. Research methodology

**3.1. Sample.** We obtained our sample listed on the New York Stock Exchange (NYSE) from the COMPUSTAT database from years 2001 to 2013. We restrict our sample to all non-financial and non-utility industry firms with available data. Firm-year observations are eliminated as follows: (1) to eliminate companies that do not continue operating on calendar year; (2) to eliminate companies with other potential earnings management motivations (e.g. financially-strapped companies with negative profits and little common stocks); and (3) to eliminate samples with incomplete variable data. Finally, the considerations above reduced the initial sample to satisfy all requirements, and obtained 14,678 firms-year observations for the 2001 through 2013 period. The composition of the sample for yearly distribution presented in Panel A of Table 1 and Panel B of Table 1 shows categorizes the firms according to two-digit GICS (global industry classification standard industries) economic sector code.

Table 1. Distribution of samples

Panel A: by year			
Year	No. of firms	%	
2001	1,139	7.76	
2002	1,132	7.71	
2003	1,130	7.70	
2004	1,147	7.81	
2005	1,146	7.81	
2006	1,139	7.76	
2007	1,108	7.55	
2008	1,115	7.60	
2009	1,116	7.60	
2010	1,130	7.70	
2011	1,138	7.75	
2012	1,167	7.95	
2013	1,071	7.30	
Total	14,678	100.00	
Panel B: by industries			
GICS economic sector	Industries	No. of firms	%
10	Energy Equipment & Services; Oil, Gas & Consumable Fuels	2,565	17.48
15	Chemicals; Construction Materials; Containers & Packaging; Metals & Mining; Paper & Forest Products	1,835	12.50
20	Aerospace & Defense; Building Products; Construction & Engineering; Electrical Equipment; Industrial Conglomerates; Machinery; Trading Companies & Distributors; Commercial Services & Supplies; Professional Services; Air Freight & Logistics; Airlines; Marine; Road & Rail; Transportation Infrastructure	3,261	22.22
25	Auto Components; Automobiles; Household Durables; Leisure Products; Textiles, Apparel & Luxury Goods; Hotels, Restaurants & Leisure; Diversified Consumer Services; Media; Distributors; Internet & Catalog Retail; Multiline Retail; Specialty Retail	2,978	20.29

Table 1 (cont.). Distribution of samples

Panel B: by industries			
GICS economic sector	Industries	No. of firms	%
30	Food & Staples Retailing; Beverages; Food Products; Tobacco; Household Products; Personal Products	968	6.59
35	Health Care Equipment & Supplies; Health Care Providers & Services; Health Care Technology; Biotechnology; Pharmaceuticals; Life Sciences Tools & Services	1,422	9.69
45	Internet Software & Services; IT Services; Software; Communications Equipment; Technology Hardware, Storage & Peripherals; Electronic Equipment, Instruments & Components; Semiconductors & Semiconductor Equipment	1,393	9.49
50	Diversified Telecommunication Services; Wireless Telecommunication Services	256	1.74
Total		14,678	100.00

**3.2. Definition of variables and empirical model.**

*3.2.1. Definition and measurement of variables.*

This study uses the variable of discretionary accrual items to estimate earnings management. In prior studies, the Modified Jones Model presented by Dechow et al. (1995) has been more capable of inspecting the manipulation status of earnings management, but we use the cross-sectional data recommended by DeFond and Jiambalvo (1994) to calculate the number of discretionary accrual items and infer their data collected from various industries in the same period (Cohen and Zarowin, 2009 & 2010; Zang, 2012; Wongsunwai, 2012). Subsequently, we measure the parametric values of the non-discretionary accrual items and use total assets to deflate each variable’s amount as follows:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \beta_0 \frac{1}{A_{i,t-1}} + \beta_1 \frac{(\Delta REV_{i,t} - \Delta REC_{i,t})}{A_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t}. \tag{1}$$

In particular, three coefficients,  $\beta_0$ ,  $\beta_1$ , and  $\beta_2$ , serve as the estimated parametric values, calculated to the non-discretionary accrual items. The total discretionary accrual items (*DA*) is the difference between the total accrued items and non-discretionary accrual items. Further, we use absolute value of discretionary accruals (*ABS\_DA*) to proxy for earnings management because accruals reverse over time and avoiding any events that provide incentives to guide manage reported earnings as described in Cohen et al. (2008).

$$DA_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - \left[ \hat{\beta}_0 \frac{1}{A_{i,t-1}} + \hat{\beta}_1 \frac{(\Delta REV_{i,t} - \Delta REC_{i,t})}{A_{i,t-1}} + \hat{\beta}_2 \frac{PPE_{i,t}}{A_{i,t-1}} \right], \tag{2}$$

where,  $TA_{i,t}$ : the total accrued items of *i* company during *t*-year, is net profits after taxes of continuing

departments minus cash flow from operations;  $\Delta REV_{i,t}$ : sales revenues of *i* company during *t*-period minus the sales revenues of the *t*-1 year;  $\Delta REC_{i,t}$ : accounts receivables of *i* company minus net amount of accounts receivable during the *t*-1 period;  $PPE_{i,t}$ : total amount of plant, property, and equipment of *i* company during the *t*-period;  $A_{i,t-1}$ : total amount of assets of *i* company during the *t*-1 year.

In the measurement of dependent variables, growth opportunity and risk are not easy to observe and calculate. We use the method of Chung and Pruitt (1994) to calculate the *TOBQ* value as the proxy variable of growth opportunity:

$$\tilde{q} = \frac{MVA + PS + DEBT}{TA}, \tag{3}$$

where, *MVA* is the market value of common stocks; *PS* is the liquidation value of preferred stocks; *DEBT* is the value of firm’s long-term debt and current liabilities; *TA* is the book value of total assets.

Although the majority of prior studies used systemic risks (beta) to measure the risk of the company, this notion has been controversial since the 1990s. Fama and French (1992) indicated that beta, compared to book-to-market ratio and market capitalization of equity, was poor in explaining cross-sectional variation in the average returns of stocks. Hence, we use the three-year coefficient variation of sales as the representation variable of risk. Due to the fact that our study focuses on growth and other operational risks, coefficients of variation of sales may be better variables to use in measuring risk. The measuring method is as follows:

$$CV_{i,t} = \frac{\sigma_{i,t}(Sales)}{Sales_{i,t}}, \text{ and } Sales_{i,t} = \frac{\sum_{t=1}^3 Sales_{i,t}}{3}. \tag{4}$$

In terms of controlling variables, DeFond and Park (1997) suggest that adding the control variable of the discretionary accrual items in the last period is necessary. In order to violate debt contracts,

management might manipulate discretionary accrual items upward. Consequently, a company that has a higher debt ratio may have more incentive for earnings management (Watts and Zimmerman, 1986; DeFond and Jiambalvo, 1994). Furthermore, based on the political cost hypothesis, large-sized companies are more likely to be noticed by markets (investors, banks, and government agencies), thus providing an incentive to minimize earnings (Warfield et al., 1995). Hence, the control variable of size is considered in our model. McNichols (2000) used ROA as the control variable for growth opportunity and discretionary accrual items. He believed that a higher company ROA is positively associated with higher discretionary accrual items. Moreover, companies with abnormally large cash flow from operations may overestimate discretionary accrual items (Dechow et al., 1995), thus we add the control variable of cash flow from operations to solve these measurement discrepancies.

3.2.2. *Empirical model.* We estimate the following equation to test the association between discretionary accruals and growth or risk in order to investigate whether high growth opportunities and high risk may affect management’s manipulation of earnings:

$$ABS\_DA_{i,t} = \beta_0 + \beta_1 TOBQ_{i,t} + \beta_2 CVSALES_{i,t} + \beta_3 LEV_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 ROA_{i,t} + \beta_6 OCF_{i,t} + \beta_7 ABS\_DA_{i,t-1} + \beta_8 \sum Year\ Indicators + \varepsilon_{it} \quad (5)$$

where,  $ABS\_DA_{i,t}$ : Absolute value of discretionary accruals of firm  $i$  in year  $t$  computed using the Modified Jones Model;  $TOBQ_{i,t}$ : Tobin’s Q (market value of common stocks and prefer stock, plus book value of liability, divided by book value of asset) of firm  $i$  in year  $t$  to proxy business growth opportunity;  $CVSALES_{i,t}$ : Covariance of sales of firm  $i$  in year  $t$  to proxy business risk;  $LEV_{i,t}$ : Debt ratio of firm  $i$  in year  $t$ ;  $SIZE_{i,t}$ : Logarithm of total asset of firm  $i$  in year  $t$  to proxy size;  $ROA_{i,t}$ : Return on total asset of firm  $i$  in year  $t$ ;  $OCF_{i,t}$ : Cash flow from operation of firm  $i$  during year  $t$ ;  $ABS\_DA_{i,t-1}$ : Discretionary accruals of firm  $i$  in year  $t-1$ .

In hypothesis 1, the coefficient  $\beta_1$  in the model is measured by the average effect of  $TOBQ$  on

$ABS\_DA$ , and it is expected that they have a positive relationship. The coefficient  $\beta_2$  in the model is tested for hypothesis 2 and measures the average effect of risk on  $ABS\_DA$ . We expect that there are positive associations between risk and  $ABS\_DA$ .

In addition, we consider both growth opportunity and risk and tests how these factors affect management’s earning management behavior. First, we use an interaction term ( $TOBQ \times CVSALES$ ) to capture the simultaneous influence of growth opportunity and risk on  $ABS\_DA$ . Further, we categorize firm-year observations into low-growth opportunity (less than or equal to the median) and high growth opportunity (more than the median) groups, or distinguish into low-risk (less than or equal to the median) and high risk (more than the median) groups. Then we use  $TOBQ \times CVSALES$  to capture their interactive effect on earnings management. The model is as follows:

$$ABS\_DA_{i,t} = \beta_0 + \beta_1 TOBQ_{i,t} + \beta_2 CVSALES_{i,t} + \beta_3 TOBQ_{i,t} \times CVSALES_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 OCF_{i,t} + \beta_8 ABS\_DA_{i,t-1} + \beta_9 \sum Year\ Indicators + \varepsilon_{it} \quad (6)$$

Finally, one concern in the analysis is whether the industry characteristic represents other phenomenon of a firm with high growth opportunities and high risk on using discretionary accruals to manipulate earnings. We conduct additional tests using the GICS economic sector to classify firm-year observations into 45 and 50 sectors for high-tech industries, and otherwise for non-high-tech industries. Then, we also rerun the regression model for high-tech industries and non-high-tech industries group.

#### 4. Multivariate results

4.1. *Univariate analysis.* Table 2 presents the summary descriptive statistics and analysis for our variables. The mean of the absolute value of discretionary accruals is 0.0577. The mean value of growth  $TOBQ$  is 1.2937 and risk  $CVSALES$  is 0.1589, showing that sample firms have positive growth opportunities and risk.

Table 2. Summary of descriptive statistics

Variable	Mean	Median	Standard deviation	25 <sup>th</sup> percentile	75 <sup>th</sup> percentile
$ABS\_DA$	0.0577	0.0365	0.0686	0.0162	0.0711
$TOBQ$	1.2937	1.0272	1.0061	0.6969	1.5407
$CVSALES$	0.1589	0.1136	0.1495	0.0624	0.2014
$LEV$	0.5604	0.5554	0.2155	0.4238	0.6764
$SIZE$	7.6026	7.5328	1.5140	6.5505	8.5871
$ROA$	0.0434	0.0486	0.0886	0.0151	0.0839
$OCF$	0.6931	0.5206	0.6796	0.2842	0.8869
$ABS\_DA_{t-1}$	0.0627	0.0377	0.0796	0.0167	0.0751

Note: 1. Total no. of samples (N = 14,678).

Table 3 presents the correlation coefficient matrix with growth opportunities (*TOBQ*) and risk between variables. Consistent to our expectations, absolute value of discretionary accrual items (*ABS\_DA*) are significantly positively correlated with growth opportunities (*TOBQ*) and risk (*CVSALES*). The correlation coefficients between each variable are below 0.4 demonstrate that there are no co-linearity problems between our variables<sup>1</sup>.

Table 3. Correlation coefficient matrix

	<i>ABS_DA<sub>i,t</sub></i>	<i>TOBQ<sub>i,t</sub></i>	<i>CVSALES<sub>i,t</sub></i>	<i>LEV<sub>i,t</sub></i>	<i>SIZE<sub>i,t</sub></i>	<i>ROA<sub>i,t</sub></i>	<i>OCF<sub>i,t</sub></i>
<i>TOBQ<sub>i,t</sub></i>	0.0807*** (0.000)						
<i>CVSALES<sub>i,t</sub></i>	0.2314*** (0.000)	0.1377*** (0.000)					
<i>LEV<sub>i,t</sub></i>	0.0158*** (0.056)	-0.1133*** (0.000)	-0.1243*** (0.000)				
<i>SIZE<sub>i,t</sub></i>	-0.1858*** (0.000)	-0.1345*** (0.000)	-0.1376*** (0.000)	0.2773*** (0.000)			
<i>ROA<sub>i,t</sub></i>	-0.1841*** (0.000)	0.4081*** (0.000)	-0.0587*** (0.000)	-0.2104*** (0.000)	0.0395*** (0.000)		
<i>OCF<sub>i,t</sub></i>	0.0015 (0.860)	0.2741*** (0.000)	0.1365*** (0.000)	-0.2941*** (0.000)	-0.0669*** (0.000)	0.3105*** (0.000)	
<i>ABS_DA<sub>t-1</sub></i>	0.2476*** (0.000)	0.0863*** (0.000)	0.2350*** (0.000)	-0.0079 (0.340)	-0.1998*** (0.000)	-0.0526*** (0.000)	0.0279*** (0.001)

Notes: 1. The value in the bracket is *p*-value. 2.\* 0.05 < *p*-value ≤ 0.1; \*\* when 0.01 < *p*-value ≤ 0.05, \*\*\* *p*-value ≤ 0.01.3. *DA<sub>i,t</sub>*: Discretionary accruals of the *t*-quarter of company *i*; *TOBQ<sub>i,t</sub>*: Tobin's Q (market value of common stocks and prefer stock, plus book value of liability, divided by book value of asset); *CVSALES<sub>i,t</sub>*: Covariance of sales of company *i*; *LEV<sub>i,t</sub>*: Debt ratio of *t*-quarter of company *i*; *SIZE<sub>i,t</sub>*: Logarithm of total asset in *t*-1 quarter of company *i*; *ROA<sub>i,t</sub>*: Return on total asset of the *t*-quarter of company *i*; *OCF<sub>i,t</sub>*: Cash flow from operation during the *t*-quarter of company *i*.

**4.2. Multivariate analysis.** Table 4 shows the regression results for equation 3. We find that both growth (*TOBQ*) and risk (*CVSALES*) have significantly positive relationships with *ABS\_DA*. Higher levels of growth and risk are associated with higher discretionary

accruals. The results suggest controlling for the other independent variables, the higher growth opportunities and risk for a company motivate management to manipulate earnings by using discretionary accrual items, as posited by Hypotheses 1 and 2.

Table 4. Influence of growth opportunities and risks on the management of discretionary accrual items

Variables	Anticipated symbols	Coefficient	<i>t</i> -value	<i>p</i> -value	VIF
Intercept	?	0.0657***	17.2299	0.0000	
<b><i>TOBQ</i></b>	+	<b>0.0083***</b>	<b>13.8569</b>	<b>0.0000</b>	<b>1.3302</b>
<b><i>CVSALES</i></b>	+	<b>0.0680***</b>	<b>18.3657</b>	<b>0.0000</b>	<b>1.1335</b>
<i>LEV</i>	+	0.0127***	4.7415	0.0000	1.2294
<i>SIZE</i>	-	-0.0056***	-14.9906	0.0000	1.1920
<i>ROA</i>	+	-0.1576***	-22.9198	0.0000	1.3735
<i>OCF</i>	-	0.0007	0.8441	0.3986	1.2429
<i>DA<sub>t-1</sub></i>	+	0.1371***	19.7767	0.0000	1.1289
<i>Year dummy</i>		included			
Adjusted R <sup>2</sup>			0.1590		
F-test			145.8139*** (0.000)		
Number of samples			14678		

Notes: 1.\* 0.05 < *p*-value ≤ 0.1; \*\* when 0.01 < *p*-value ≤ 0.05, \*\*\* *p*-value ≤ 0.01. 2. *ABS\_DA<sub>i,t</sub>*: Absolute value of discretionary accruals of firm *i* in year *t* computed using the Modified Jones Model; *TOBQ<sub>i,t</sub>*: Tobin's Q (market value of common stocks and prefer stock, plus book value of liability, divided by book value of asset) of firm *i* in year *t* to proxy business growth opportunity. *CVSALES<sub>i,t</sub>*: Covariance of sales of of firm *i* in year *t* to proxy business risk; *LEV<sub>i,t</sub>*: Debt ratio of firm *i* in year *t*; *SIZE<sub>i,t</sub>*: Logarithm of total asset of firm *i* in year *t* to proxy size. *ROA<sub>i,t</sub>*: Return on total asset of firm *i* in year *t*. *OCF<sub>i,t</sub>*: Cash flow from operation of firm *i* during year *t*; *ABS\_DA<sub>i,t-1</sub>*: Discretionary accruals of firm *i* in year *t*-1.

<sup>1</sup> The VIF value of the revolving variable is smaller than 10, showing that the estimated coefficient of each variable will not cause instability in the revolving coefficient or decrease its clarity due to the common linearity between the variables. The Durbin-Watson is closer to 2, which shows that there is no ego-related problem.

Table 5, Panel A shows that there is a positive relationship between business growth and earnings management ( $t$ -value = 0.0056,  $p$  = 0.000), and there is also a positive association between risk and earnings management ( $t$ -value = 0.0517,  $p$  = 0.000). In addition, when both high growth opportunities and high risk exist simultaneously, there is a significantly positive association between the interaction variable ( $TOBQ \times CVSALES$ ) and discretionary accrual items ( $t$ -value = 0.0112,  $p$  = 0.000). Empirical results indicate that when high growth opportunities and high risk exist at the same

time, management may use discretionary accrual items to raise earnings.

In addition, consistent with the preliminary analysis, Panel B and Panel C show that firms having higher growth opportunities and high risk are positively associated with earnings management by using discretionary accrual items under high-growth opportunity group or high-risk group. Thus, the evidence implies that growth opportunities and risk is highly effective variables in explaining a firm's decisions to manage earnings.

Table 5. The effect of both growth opportunities and risk on earnings management

Panel A. The interaction effect between growth and risk						
Variables	Anticipated symbols	Coefficient	$t$ -value	$p$ -value	VIF	
Intercept	?	0.0679***	17.6345	0.0000		
<b>TOBQ</b>	+	<b>0.0056***</b>	<b>6.4681</b>	<b>0.0000</b>	<b>2.8504</b>	
<b>CVSALES</b>	+	<b>0.0517***</b>	<b>9.5726</b>	<b>0.0000</b>	<b>2.4218</b>	
<b>TOBQ <math>\times</math> CVSALES</b>	+	<b>0.0112***</b>	<b>4.1119</b>	<b>0.0000</b>	<b>4.1385</b>	
LEV	+	0.0138***	5.1298	0.0000	1.2417	
SIZE	-	-0.0056***	-14.8237	0.0000	1.1939	
ROA	+	-0.1518***	-21.6612	0.0000	1.4298	
OCF	-	0.0009	1.0140	0.3106	1.2451	
$DA_{t-1}$	+	0.1357***	19.5650	0.0000	1.1315	
Year dummy		included				
Adjusted R <sup>2</sup>		0.1599				
F-test		139.5190*** (0.000)				
Number of samples		14678				
Panel B. Classify by growth median						
Variables	TOBQ $\geq$ median			TOBQ < median		
	Coefficient	$t$ -value	$p$ -value	Coefficient	$t$ -value	$p$ -value
Intercept	0.0616***	10.4588	0.0000	0.0779***	13.8383	0.0000
TOBQ	0.0055***	4.6888	0.0000	-0.0091**	-2.0841	0.0372
CVSALES	0.0413***	4.5705	0.0000	0.0821***	5.7717	0.0000
TOBQ $\times$ CVSALES	0.0146***	4.1926	0.0000	-0.0218	-1.1409	0.2539
Control variables		included			included	
Year dummy		included			included	
Adjusted R <sup>2</sup>		0.1929		0.1391		
F-test		87.4396*** (0.000)		59.1357*** (0.000)		
Number of samples		7336		7342		
Panel C. Classify by risk median						
Variables	CVSALES $\geq$ median			CVSALES < median		
	Coefficient	$t$ -value	$p$ -value	Coefficient	$t$ -value	$p$ -value
Intercept	0.0705***	11.0652	0.0000	0.0550***	11.5669	0.0000
TOBQ	0.0043***	2.8429	0.0045	0.0103***	5.4936	0.0000
CVSALES	0.0455***	5.4705	0.0000	0.0584	1.6342	0.1023
TOBQ $\times$ CVSALES	0.0132***	3.3350	0.0009	-0.0268	-1.0866	0.2773
Control variables		included			included	
Year dummy		included			included	
Adjusted R <sup>2</sup>		0.1494		0.1268		
F-test		64.2571*** (0.000)		53.1474*** (0.000)		
Number of samples		7339		7339		

Notes: 1. \*  $0.05 < p$ -value  $\leq 0.1$ ; \*\* when  $0.01 < p$ -value  $\leq 0.05$ , \*\*\*  $p$ -value  $\leq 0.01$ . 2.  $ABS\_DA_{i,t}$ : Absolute value of discretionary accruals of firm  $i$  in year  $t$  computed using the Modified Jones Model;  $TOBQ_{i,t}$ : Tobin's Q (market value of common stocks and prefer stock, plus book value of liability, divided by book value of asset) of firm  $i$  in year  $t$  to proxy business growth opportunity.  $CVSALES_{i,t}$ : Covariance of sales of of firm  $i$  in year  $t$  to proxy business risk;  $LEV_{i,t}$ : Debt ratio of firm  $i$  in year  $t$ ;  $SIZE_{i,t}$ : Logarithm of total asset of firm  $i$  in year  $t$  to proxy size.  $ROA_{i,t}$ : Return on total asset of firm  $i$  in year  $t$ .  $OCF_{i,t}$ : Cash flow from operation of firm  $i$  during year  $t$ ;  $ABS\_DA_{i,t-1}$ : Discretionary accruals of firm  $i$  in year  $t-1$ .

As an additional robustness test, we categorized firm-year observation into high-tech industries and non-high-tech industries. In Table 6, we find that firms in high-tech industries is significantly positively associated with discretionary accrual items when firms with higher growth opportunity and risk simulta-

neously. However, coefficient of *TOBQ*, *CVSALES*, and *TOBQ* × *CVSALES* are all significantly positive with discretionary accruals. These findings suggest that firms in non-high-tech industries, management is more likely to manipulate earnings whenever a firm has faced higher growth opportunities or higher risk.

Table 6. Testing results by control industry factor

Variables	High-tech industries			Non-high-tech industries		
	Coefficient	t-value	p-value	Coefficient	t-value	p-value
Intercept	0.0672***	5.8323	0.0000	0.0701***	17.0066	0.0000
<i>TOBQ</i>	0.0006	0.2543	0.7993	0.0062***	6.6120	0.0000
<i>CVSALES</i>	0.0023	0.1222	0.9028	0.0596***	10.4091	0.0000
<b><i>TOBQ</i> × <i>CVSALES</i></b>	<b>0.0336***</b>	<b>4.7311</b>	<b>0.0000</b>	<b>0.0062**</b>	<b>2.0535</b>	<b>0.0400</b>
<i>LEV</i>	0.0114	1.4572	0.1453	0.0152***	5.2445	0.0000
<i>SIZE</i>	-0.0034***	-2.9811	0.0029	-0.0060***	-15.1277	0.0000
<i>ROA</i>	-0.1823***	-9.7862	0.0000	-0.1424***	-18.4828	0.0000
<i>OCF</i>	0.0008	0.2112	0.8327	0.0011	1.2355	0.2166
<i>DA<sub>t</sub></i>	0.1452***	6.8341	0.0000	0.1333***	18.0890	0.0000
Year dummy		included			included	
Adjusted R <sup>2</sup>	0.2450			0.1496		
F-test	26.4193*** (0.000)			114.4569*** (0.000)		
Number of samples	1649			13029		

Notes: 1. \*  $0.05 < p\text{-value} \leq 0.1$ ; \*\* when  $0.01 < p\text{-value} \leq 0.05$ , \*\*\*  $p\text{-value} \leq 0.01$ . 2. *ABS\_DA<sub>it</sub>*: Absolute value of discretionary accruals of firm *i* in year *t* computed using the Modified Jones Model; *TOBQ<sub>it</sub>*: Tobin's Q (market value of common stocks and prefer stock, plus book value of liability, divided by book value of asset) of firm *i* in year *t* to proxy business growth opportunity. *CVSALES<sub>it</sub>*: Covariance of sales of firm *i* in year *t* to proxy business risk; *LEV<sub>it</sub>*: Debt ratio of firm *i* in year *t*; *SIZE<sub>it</sub>*: Logarithm of total asset of firm *i* in year *t* to proxy size. *ROA<sub>it</sub>*: Return on total asset of firm *i* in year *t*. *OCF<sub>it</sub>*: Cash flow from operation of firm *i* during year *t*; *ABS\_DA<sub>it-1</sub>*: Discretionary accruals of firm *i* in year *t-1*.

In summary, this paper finds that the firms with higher growth opportunity and risk, management are more likely to use discretionary accruals for earnings management. In addition, this study compares the effect on manipulate earnings between two groups when they have encountered higher growth opportunities or faced higher risk. The obtained results suggest that the effect increased significantly in a firm with higher growth opportunities and risk at the same time for positive discretionary accrual items.

## Conclusions

This study examines the effects of growth opportunities and risk on earnings management incentives and investigates the interaction among these three elements. This paper examines 14,678 firm-year observations in the time period from 2001 to 2013 and finds that companies with higher levels of growth opportunities usually use discretionary accrual items to increase earnings. We conclude that if the company is inclined to convey a positive impression to market investors, management may use discretionary accruals to manipulate its earnings. On the other hand, the results demonstrate that companies in danger of a high level of risk are likely to use discretionary accrual items to raise earnings. The results indicate that management might attempt

to create a good operating image by using discretionary accruals to convince investors to keep the stock price stable when the company has higher risk.

This paper contributes to the literatures and practices in the following ways. This study provided a different result compared with the studies done by McNichols & Stubben (2008) and Cohen & Zarowin (2009) by using firms' investment behavior or decision proxy as future growth opportunities, and examining how managers engaged in using earnings management during investment period. In addition, this paper extended the study from AlNajjar and Riahi-Belkaoui (2001) and provided evidences onto the potential relationship between growth opportunities and discretionary accruals. This paper directly investigates whether growth opportunity and risk are major determinants of earnings management. Furthermore, most people believe that when a company is uncertain about its future growth, it also faces higher level of risk. Companies should adopt a more conservative strategy for earnings evaluation. However, in our findings, the evidence shows that companies that face higher risk and higher growth tend to use discretionary accrual items to manage earnings.

Finally, we conclude our findings by emphasizing that corporate characteristics pertaining for high

growth opportunities and high risks affect management's use of discretionary accrual items to manipulate earnings. Thus, to avoid failing on the part of investors, we recommend that investors do not completely believe the companies' financial reporting. They also need to consider the companies' growth opportunities, risks, and whether earnings management phenomenon exists.

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