CFO Gender and Earnings Management: Evidence from China

Zuobao Wei and Feixue Xie *

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ABSTRACT

In this paper, we study the relation between CFO gender and earnings management in China. Using a large sample of publicly traded firms from 1999-2006, we find evidence that male CFOs engage in more earnings management than female CFOs. Specifically, our cross-sectional analysis shows that female CFO firm-years have significantly lower discretionary current accruals, lower abnormal production costs, and higher abnormal discretionary expenses than male CFO firm-years. Overproduction in male CFO firm-years is more pronounced among manufacturing firms. We further study a subsample of CFO turnovers and find that male new CFOs are more aggressive than female new CFOs in managing down earnings during their first year as CFO. One possible explanation is that male new CFOs intentionally manage down earnings in the first year in order to take bigger credit for any subsequent performance improvement. Overall, our evidence supports the hypothesis that female CFOs are more risk averse in making financial reporting and operational decisions than male CFOs are.

Keywords: CFO; gender; risk aversion; earnings management; China

* Both authors are with the Department of Economics and Finance, University of Texas at El Paso, El Paso, Texas 79968. Wei can be reached at (915) 747-5381 or zwei@utep.edu.

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1. INTRODUCTION

Men and women have different risk preferences and risk perceptions. Overwhelming evidence in sociology, psychology, and behavioral economics concludes that women are more risk averse than men (Arch 1993; Byrnes, Miller and Schafer 1999, Barber and Odean 2001; Sunden and Surette 1998; and Levin, Snyder and Chapman 1989). In this paper, we study the relation between gender and risk preferences in corporate finance. We focus on the gender of chief financial officer (CFO) and employ earnings management as a proxy for risk preferences. We address a specific question: do female CFOs engage in less earnings manipulation than their male counterparts?

CFO in a contemporary corporation bears the ultimate responsibility for its financial strategies that includes financial reporting, treasury and tax management, cost management and control, capital structure, among others (Mian, 2001). The importance of the role a CFO plays is fully recognized by regulators. For example, the Sarbanes-Oxley Act of 2002 requires both the CEO and CFO of a publicly traded U.S. firm to personally certify the material accuracy and completeness of the financial information and disclosures released to the public. Thus in the U.S., CFO is legislatively elevated to the same level of the CEO in terms of financial reporting and oversight (Geiger and North 2006). Despite the importance of the CFO position, very little attention in academia has been paid to the role a CFO plays in corporate finance, with Mian (2001), Geiger and North (2006) and Jiang, Petroni and Wang (2010) being the exceptions. Mian (2001) studies why U.S. firms replace their CFOs and finds that CFO turnovers are largely disciplinary. Geiger and North (2006) study earnings management surrounding

CFO turnovers and find that discretionary accruals decreased significantly following the appointment of a new CFO. In a recent study that is more relevant to this study, Jiang, Petroni and Wang (2010) compare CFOs and CEOs in relation to earnings management and find that CFOs have more influence than CEOs in earnings management decisions. Empirical evidence on the relation between CFO gender and corporate finance is even scarcer.

In this paper, we study the relation between CFO gender and earnings management in China's publicly traded firms. To the best of our knowledge, we are not aware of any other paper, published or otherwise, that directly examines this relation. [1]

We focus on CFOs in China for several reasons. On the macro level, China is an important country with the world's second largest stock market by market cap and the third largest GDP. Research related to China's corporate sector will continue to be of interest to scholars, investors and policymakers.

Second, the CFO position in China's listed companies is as important as that in the U.S. The CFO title in the Chinese language is composed of four characters: 财务总监. The first character means finance; the second means task; the third means all-encompassing; and the fourth means monitor or manager. On company annual reports, CFO is typically the second or third person on the list of the firm's top management team, only after the CEO (general manager) and sometimes the chief operating officer (COO, or executive deputy general manager, or president in some firms). [2] This signifies the importance of the CFO position and the power and responsibility a CFO has. CFO is also

[1] Two contemporaneous working papers study the relation between CFO gender and corporate finance using U.S. data. See more discussions in the next section.

[2] The Company Laws of the People's Republic of China states that "Senior managers include the manager, deputy manager and the person in charge of financial affairs of the company (Article 217)."

legally an important position. The Securities Laws of the People's Republic of China adopted on December 29, 1998 states that senior managers must provide written certification of the truthfulness, accuracy and completeness of all material information released to the public and that directors and senior managers can be held jointly and severally liable to investor losses caused by false and misleading information.[3]

Third, among China's listed firms during our sampling period in 1999-2006, the percentage of CFOs who are female ranges from 27% to 31%, remarkably high and stable compared to that in the U.S. [4] This allows us to focus on the impact of CFO gender on corporate decisions.[5]

In our empirical analysis, we first perform cross-sectional tests for the differences in earnings management between female CFO firm-years and male CFO firm-years. We find that female CFO firm-years have significantly lower discretionary current accruals, lower abnormal production costs, and higher discretionary expenses than male CFO firm-years. The results are robust after controlling for firm size, lagged performance, ownership structure and corporate governance, year and firm fixed effects. We next apply a difference-in-difference framework to a subsample of male-to-male versus male-to-female CFO turnovers, and find that male new CFOs are more aggressive than female new CFOs in managing down earnings in their first year as CFO by manipulating discretionary accruals and discretionary expenses.

[3] For detailed description, please see Chapter 3, Article 68 in The Securities Laws of the People's Republic of China.
[4] Among all CFOs in major U.S. corporations, female CFOs represented only 2.8% in 1994 and increased to 8.0% in 2005 (Huang and Kisgen 2008).
[5] In Huang and Kisgen (2008), the authors examine gender diversity, gender discrimination and equal opportunity in corporate America in the context of male vs female CFO qualifications. In our study, we assume that male CFOs and female CFOs in China have comparable qualifications.

Our paper contributes to the understanding of the relation between gender and risk preferences in a corporate setting. In particular, it contributes to the earnings management literature by taking into account the impact of the gender of the chief financial decision maker in a corporation, the CFO.

The rest of the paper is organized as follows. Section 2 discusses pertinent prior research and develops the hypotheses for this study. Section 3 discusses sample and methodologies, while Section 4 presents and discusses empirical results. Section 5 concludes this paper.

2. PRIOR RESEARCH AND HYPOTHESIS DEVELOPMENT

This study is related to literatures in gender and risk across several disciplines, including sociology, psychology, economics, and finance. We first provide a brief review of relevant research in these disciplines, followed by a review of earnings management literature. We then propose our hypotheses based on the extant theoretical and empirical evidence discussed here.

2.1 Gender and risk preferences

A large volume of literature in psychology and sociology has shown that women are more risk averse than men. For instance, Byrnes, Miller and Schafer (1999) survey 150 studies over the last three decades and compare risk-taking tendencies of male and female participants in a variety of settings. They classify all the activities into 16 tasks, and find that in 14 of the 16 tasks, women are significantly more risk averse than men. Arch (1993) surveys 50 gender and risk related studies and reach the same conclusion that

women are more risk averse than men. Arch (1993) attributes this phenomenon to the differences in risk perception between men and women. For instance, for the same risky situation, men may treat it as a challenge that calls for participation, whereas women may see it as a threat that encourages avoidance.

There is also a large volume of literature in economics that focuses on gender and financial risk. Using data from the Survey of Consumer Finances, Sunden and Surette (1998) study asset allocations of defined contribution plans and find that gender and marital status are significant determinants of allocation of risky assets. Using the same data, Jianakoplos and Bernasek (1998) examine the investing behaviors of single men, single women, and married couples. They find that single women are significantly more risk averse than single men. Hinz, McCarthy and Turner (1997) analyze data from a 1990 Survey of Participants of the Federal Thrift Savings Plan and find women invest their pension contributions more conservatively than men. Similarly, Bajtelsmit and van Derhei (1997) study individual pension asset allocations and find that women are more likely to invest in fixed-income securities than men.

Odean (1998) proposes an overconfidence hypothesis to explain the gender difference in financial risk preference. His theoretical model shows that overconfident investors hold higher portion of risky assets and trade more often than rational investors. Barber and Odean (2001) empirically test the overconfidence model and find that men trade 45% more and earn 1.4% lower risk-adjusted annual return than women. Experimental evidence in psychology and economics also collaborates that men are more likely to be overconfident than women.[6]

[6] See, for instance, Deaux and Farris (1977), Lundeberg, Fox, and Punccohar (1994), Estes and Hosseini (1988), among others.

2.2 Gender and corporate finance

In contrast, very little academic attention has been given to the relation between the genders of corporate executives and corporate decision makings. A recent paper by Adams and Ferreira (2009) studies the impact of corporate board with female directors on corporate governance and performance. They find that female directors have better board meeting attendance than male directors and that CEO turnover is more sensitive to stock performance if the board is more gender-diverse. They also find that the addition of female directors to the board has negative effect on performance. However, Adams and Ferreira (2009) do not control for any potential differences in risk aversion among male and female board members.

Several contemporaneous working papers also address the topic of gender and corporate finance. Huang and Kisgen (2008) study CFO gender and corporate decisions surrounding CFO transitions. They find that relative to their male counterparts, female CFOs issue less debt and engage in fewer mergers and acquisitions (M&A). They further find that the announcement abnormal returns of M&As by female CFOs are higher than that by males CFOs. In a related study, Francis, Hasan, Park and Wu (2009) find that female CFOs tend to adopt more conservative reporting policies than male CFOs surrounding CFO transitions. Gul, Srinidhi and Tsui (2007) study the impact of female directors on earnings quality and find that firms with female directors on board have higher quality of accruals and lower tendency to manage earnings.

Our study compliments the aforementioned papers in that we focus on CFOs in China while Huang and Kisgen (2008) focus on U.S. firms. Furthermore, we focus on

CFOs, the decision makers, while Gul et al (2007) and Adam and Ferreira (2009) focus on board of directors, those who monitor the decision makers.

2.3 Earnings management

Healy and Wahlen (1999) define earnings management as follows:

> *"Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers."* (page 368)

Numerous studies have shown that U.S. firms engage in earnings management.[7] Several studies show that China's listed firms also manipulate earnings. Aharony, Lee and Wong (2000) examines the earnings patterns of IPO firms in China and find that Chinese state-owned firms engage in "financial packaging" two years before selling shares to foreign investors. Chen and Yuan (2004) and Yu, Du and Sun (2006) find that China's seasoned equity offering (SEO) firms engage in earnings management in order to meet the regulatory thresholds for SEO.

Firms can manage earnings through accounting accruals manipulations that bear no direct cash flow consequences. Much of the existing literature on earnings management focuses on accounting accruals earnings management. Firm can also manage earnings through real activities manipulations that affect cash flows of the firm. Roychowdhury (2006) defines real activities manipulation as

> "*departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations*." (page 337)

[7] See survey papers by Kathari (2001) and Healy and Wahlen (1999).

Roychowdhury (2006) introduces empirical methods to detect real activities manipulations, including sales manipulations, reduction in discretionary expenditures, and overproduction. A firm can manipulate sales through price discounts or offering more lenient credit terms to boost sales volume in the current period. If a firm manipulates its sales, cash flow from operations would be lower and production costs would be higher than under a normal sales level.

Discretionary expenses, such as R&D, selling and advertising, and maintenance expenses are generally expensed in the same period in which they occur. This provides managers with opportunities to manage earnings through manipulating these discretionary expenses. If a manager intentionally manages up current period earnings, discretionary expenditures would be lower than that under a normal operational condition.

In manufacturing firms, managers can manage up current period earnings through intentionally producing more units than the expected demand. With higher production levels, fixed costs are spread out over a large number of units produced. The reduction in fixed cost per unit for the current period on average leads to lower total cost per unit, assuming marginal cost per unit remains constant. This leads to lower costs of goods sold (COGS) and higher operating margin for the current period. Nevertheless, costs associated with the overproduced items have already incurred and are not recovered through sales in the same period. As a result, cash flow from operations is lower than normal for a given sales level. Other things constant, Roychowdhury (2006) argue that overproduction leads to abnormally high current period production costs defined as COGS plus change in inventory.

Roychowdhury (2006) shows that sales manipulation through price discounts and overproduction could have a negative effect on contemporaneous abnormal cash flows, whereas reduction of discretionary expenses could have a positive effect. He concludes that the net effect of real activities manipulations on abnormal operating cash flow is ambiguous. However, it is clear that firms that engage in real activities manipulations should exhibit an unusually low abnormal discretionary expenditures and unusually high abnormal production costs, if the manager intends to manage up current period earnings.

2.4 Hypotheses: Tying things together

Earnings management through accrual manipulations entails a risk to managers who engage in it (Roychowdhury 2006). In cases where the earnings management activities are illegal, such as capitalizing items that should have been expensed, the risk to the manager is that he or she may be caught and charged with accounting frauds. Some earnings management activities are not technically illegal but unethical, such as intentional overproduction and sales manipulations.[8] According to definitions by both Healy and Wahlen (1999) and Roychowdhury (2006), earnings management can be viewed as an unethical behavior because it provides misleading information to some stakeholders and it is unfair to competitors who do not engage in it. Unethical behavior per se is a risk. In summary, there is strong empirical and experimental evidence showing that women are more risk averse and more ethical than men.

[8] Rokeach (1968, 1971) measures a person's ethical values with four characters, namely "equality, freedom, honest, and responsible."

Based on the discussions above, we argue that female CFOs are more risk averse than male CFOs, and that female CFOs engage in less earnings manipulations. This leads to our main hypothesis (in alternative form):

H1: Ceteris paribus, female CFO firm-years exhibit lower degree of earnings manipulations than male CFO firm-years.

The null hypothesis is that there is no difference in earnings management between female CFO firm-years and male CFO firm-years. We employ both accounting accruals and real activities earnings management measures in this study, namely, discretionary current accruals, abnormal production costs, and abnormal discretionary expenses. On can argue that abnormal production costs may not be an appropriate earnings management measure for this study because chief operating officer (COO) is the one directly responsible for the production process, not the CFO. However, in a contemporary corporation, CFO of a firm has significant influence on and is intimately involved in all aspects of the firm's operation, especially when it comes to cost related matters (Mian 2001). Realized production costs is calculated as costs of goods sold (COGS) plus change in inventory. And managing COGS and inventory level is largely a joint responsibility of the COO and the CFO. Therefore, we include abnormal production costs as an earnings management measure.

Our measure-specific hypotheses are as follows:

H1A: *Ceteris paribus, female CFO firm-years exhibit lower discretionary current accruals than male CFO firm-years.*

H2A: *Ceteris paribus, female CFO firm-years exhibit lower abnormal production costs than male CFO firm-years.*

H3A: *Ceteris paribus, female CFO firm-years exhibit higher abnormal discretionary expenses than male CFO firm-years.*

Manufacturing firms generally afford more opportunities for managers to manipulate earnings through overproduction and sales manipulation. We therefore expect that overproduction and sales manipulations by male CFOs be more pronounced in manufacturing industries. As an extension of H2A, we hypothesize that:

H2A1*: Ceteris paribus, female CFO firm-years exhibit lower abnormal production costs than male CFO firm-years in the manufacturing industries.*

We further examine earnings management surrounding CFO transitions by gender. Using a sample of CFO turnovers in the U.S. firms, Geiger and North (2006) find that the departing CFOs manage up earnings in year (t-1) (t is the year of CFO transition) in an attempt to keep their jobs or to get a better retirement package. They also find that the new CFOs intentionally manage down earnings in year (t+1) so that they can take bigger credits for any performance improvement in the subsequent years. We build on Geiger and North (2006) by adding CFO gender into the equation. Based on evidence that women are more risk averse and more ethical than men, we hypothesize that if the succeeding CFOs are male, earnings manipulation in year (t+1) would be more pronounced than in cases where the succeeding CFOs are female. We focus on changes in discretionary current accruals and abnormal discretionary expenditures from year (t-1) to year (t+1) because manipulations in these areas are more likely to provide immediate results. Specifically, we hypothesize:

H1B: *Ceteris paribus, if the succeeding CFO is male, the decrease in discretionary accruals from year (t-1) to year (t+1) would be bigger than if the succeeding CFO is female.*

H2B: *Ceteris paribus, if the succeeding CFO is male, the increase in discretionary expenses from year (t-1) to year (t+1) would be bigger than if the succeeding CFO is female.*

3. SAMPLE AND METHODOLOGY

3.1 Sample description

We obtain our financial data through the CSMAR (Chinese Securities Market and Accounting Research) databases on WRDS (Wharton Research Data Services). CSMAR's Corporate Governance Research database contains names and genders of top corporate officers for all firms listed in both the Shanghai and Shenzhen Stock Exchanges in 1999-2006. It also provides governance data for listed firms. We include all firm-years that have both names and gender of the CFOs.[9] Table 1 presents descriptive statistics of female versus male CFOs by year (Panel A) and by industry (Panel B).

(Table 1 here)

The descriptive statistic indicates that female CFO representation in China's corporate sector is remarkably high and stable over the sample period. The average percentage of female CFOs among all CFOs in China is about 28% over the sample

[9] A small percentage of firms have CFO names but no gender information. Through educated guesses, we were able to obtain the gender information for most of these CFOs. For example, in the U.S., it would be an educated guess to associate given names of "Jennifer" with female and "Joseph" with male.

period. In addition, about two-third of the sample observations (i.e. 5076 firm-years out of a total of 7664 CFO firm-years) are in the manufacturing industries.

In subsequent analysis, we exclude financial firms and firm-years with missing data. As a result, our final sample consists of 1820 female CFO firm-years and 4959 male CFO firm-years. Table 2 presents summary statistics for the relevant variables employed in this study. Appendix A provides definitions and descriptions for these variables. Several interesting observations can be found in Table 2. Female CFOs are associated with firms that are smaller by mean assets, mean sales, mean number of employees, and mean market capitalization. Female CFOs are also associated with lower stock returns volatility. In addition, firms with female CFOs exhibit lower state ownership and higher institutional ownership compared to firms with male CFOs. Measured by return on assets (ROA) and return on sales (ROS), there is no performance difference between female and male CFO firm-years. Lastly, female CFOs are two to three years older than their male counterparts.

(Table 2 here)

3.2 Earning management measures

Since the existing literature argues that executives have the most immediate and direct discretions over current accruals, we use current discretionary accruals as a proxy for accrual-based earnings management.[10] As in DeFond and Jiambalvo (1994) and Geiger and North (2006), we employ the following model to estimate normal or predicted current accruals:

[10] See, for instance, Becker et al (1998), DeFond and Park (2001) and Ashbaugh et al (2003), among others.

$$\frac{CAC_{i,t}}{TA_{i,t-1}} = \frac{\alpha_1}{TA_{i,t-1}} + \beta_{1,i}\frac{(\Delta S_{i,t} - \Delta REC_{i,t})}{TA_{i,t-1}} + \varepsilon_i \quad (1)$$

where CAC is current accruals, TA is total assets, ΔREC is the change in accounts receivable, S is sales revenue, and ΔS_t (= S_t-S_{t-1}) is change in sales.

Model (1) is estimated each year cross-sectionally for every two-digit SIC equivalent industry as classified by CSRC (China Security Regulatory Commission) using all available firms except the sample firm. The estimated coefficients are then used to estimate predicted current accruals.[11] Discretionary current accruals (DCAC) are the difference between actual current accruals (CAC) and the predicted current accruals.

We follow Roychowdhurry (2006) to estimate earnings management through real activities manipulations as follows. The model (2) is used to estimate predicted production costs, and model (3) for estimating predicted discretionary expenditures:

$$\frac{PCOST_{i,t}}{TA_{i,t-1}} = \alpha_0 + \alpha_1(\frac{1}{TA_{i,t-1}}) + \beta_1(\frac{S_{i,t}}{TA_{i,t-1}}) + \beta_2(\frac{\Delta S_{i,t}}{TA_{i,t-1}}) + \beta_3(\frac{\Delta S_{i,t-1}}{TA_{i,t-1}}) + \varepsilon_i \quad (2)$$

$$\frac{DXPN_{i,t}}{TA_{i,t-1}} = \alpha_0 + \alpha_1(\frac{1}{TA_{i,t-1}}) + \beta(\frac{S_{i,t-1}}{TA_{i,t-1}}) + \varepsilon_i \quad (3)$$

where PCOST is production cost, and DXPN is discretionary expenditures.

Similar to model (1), models (2) and (3) are estimated each year cross-sectionally by industry. Abnormal production costs (ABPCOST) are the difference between actual production costs (PCOST) and the predicted production costs estimated by model (2).

[11] Industries with fewer than ten firms are grouped into the next closest industries according to the CSRC classifications.

Abnormal discretionary expenditures (ABDEXPN) are the difference between actual discretional expenditures (DXPN) and the predicted discretionary expenditures estimated by model (3).

3.3 A cross-sectional regression analysis

In addition to providing a simple comparison of earning management measures between female CFOs and male CFOs, we perform a cross-sectional regression analysis to control for other factors that may also affect earnings management, as follows:

$$EM = \beta_0 + \beta_1 Female + \sum \gamma_j X_j + \varepsilon \qquad (4)$$

where EM is one of the three earnings management measures described above. Female is a gender indicator. It is equal to one if the CFO is female, and zero if the CFO is male. Xj (j=1, 2, 3, …,k) is a set of k control variables discussed below. The regression model (4) is estimated by controlling both firm and time fixed effects. If our hypotheses H1A, H2A, and H3A are valid, we would expect the coefficient of β_1 to be negative for hypotheses H1A, H2A, and H2A1, and to be positive for hypothesis H3A.

As in Gerger and North (2006), the control variables are firm size (log of total assets, LOGTA), book-to-market ratio (BM), cash flow from operations scaled by lagged total assets (CFFO), sales growth from previous period (GROWTH), and lagged ROA (LAGROA). Existing evidence in the literature indicates that firm size, book-to-market ratio, and cash flow from operations are all negatively related to discretionary accruals,

while sales growth is positively associated with discretionary accruals.[12] The lagged ROA is included to control for a firm's prior performance.

In addition, we control for ownership structure, corporate governance, and the age of CFOs in the regression. Most of our sample firms are former state-owned enterprises that were partially privatized through share issue privatization (SIP). As a result, the government (STATE) retains shares in most of the publicly traded former state-owned enterprises. On average, the state owns 31.45% of total shares outstanding in our sample firms as shown in Table 2.[13] Wei, et al (2005), and Sun and Tong (2003) show that high state ownership may lead to high agency costs and low firm performance. High agency costs indicate lower effort of monitoring. Under lax monitoring environments, managers may intensify earnings management activities. We hence expect that state ownership and discretionary accruals are positively correlated. On the other hand, institutional shareholders are mostly profit-oriented and have incentives to monitor managers' activities. As shown in Roychowdhury (2006), institutional ownership (inst) and real earnings management are expected to be negatively related.

Existing research also indicate that good corporate governance reduces discretionary accruals (Klein 2002, Xie et al 2003). In particular, the number of independent directors as a fraction of total board of directors (INDR) and board size (BSIZE) are found to be negatively related to discretionary accruals. While some researchers argue that duality (CEO and chairman are the same person) provides a good corporate governance, others argue for precisely the opposite. We leave it as an empirical

[12] See, for instance, Ashbaugh et al. (2003), Butler et al. (2004), Chung and Kallapur (2003), and Menon and Williams (2004), among others.
[13] 31.45% is the average of state ownership for female CFO firm-years (30.4%) and for male CFO firm-years (32.5%).

question. We include age of the CFOs in the regression to control for age-related risk aversion, and we expect a negative relation between age and earnings manipulation.

3.4 A difference-in-difference approach

To further explore the relation between gender of CFOs and risk preference, we focus on earnings management surrounding two types of CFO transitions: male-to-male and male-to-female transitions. We employ a version of the difference-in-difference framework (Betrand, Duflo and Mullainathan 2004; Card and Kreuger 1994) in this study, as illustrated below. First, we compute the mean difference in earnings management measures before and after the male-to-male CFO transitions, as well as the male-to-female CFO transitions, as follows:

$$\text{Male-to-male (MM):} \quad \Delta MM = (EM)_{M,after} - (EM)_{M,before} \tag{5}$$

$$\text{Male-to-female (MF):} \quad \Delta MF = (EM)'_{F,after} - (EM)'_{M,before} \tag{6}$$

where EM is one of the three earning management measures. We next compute the mean difference between the two types of transitions:

$$\begin{aligned} (6) - (5) \quad &= \Delta MF - \Delta MM \\ &= [(EM)'_{F,after} - (EM)'_{M,before}] - [(EM)_{M,after} - (EM_{M,before}] \\ &= [(EM)'_{F,after} - (EM)_{M,after}] - [(EM)'_{M,before} - (EM)_{M,before}] \end{aligned} \tag{7}$$

The difference-in-difference framework assumes that by focusing on MM and MF transitions, earnings management activities under departing male CFOs are held constant, or $[(EM)'_{M,before} - (EM)_{M,before}]$ is insignificant. By taking the same-firm, after/before

difference, any unobservable firm fixed effects are eliminated. Thus, any between-sample changes (ΔMF-ΔMM) in earnings management activities from (t-1) to (t+1) can be attributable to gender difference of the CFOs.

4. EMPIRICAL RESULTS

4.1 Univariate tests: H1A – H3A

Table 3 presents the results based on simple comparison of the means and medians between female CFO firm-years and male CFO firm-years. The results show that female CFO firm-years have significantly lower discretionary current accruals (DCAC) than male CFO firm-years. The difference is significant at the 5% level for mean difference and at the 1% level for median difference.

(Table 3 here)

For abnormal production costs (ABPCOST), the median difference between female and male CFO firm-years is significant at the 1% level. The median difference in abnormal discretionary expenses (ABDEXPN) between female and male CFO firm-years is significant at the 5% level. Mean differences of these two real earnings management measures between female and male CFO firm-years are not statistically significant. Our results based on median differences of univariable comparison seem to suggest that male CFOs are more likely to manage earnings through both accruals and real activities manipulations than female CFOs.

4.2 Multivariate Tests: H1A – H3A

Table 4 presents two sets of multivariate test result for hypothesis H1A with discretionary current accruals (DCAC) as dependent variable. Column (1) shows that the main variable of the study, the gender indicator (female), has a significantly negative coefficient, implying that female CFO firm-years have substantially lower discretionary current accruals than male CFO firm-years. Most of our control variables have the expected signs and are generally significant, except sales growth (GROWTH) and prior performance (LAGROA) that are insignificant.

(Table 4 here)

Column (2) in Table 4 shows that, after further controlling for ownership structure, corporate governance, and year and firm fixed effects, the coefficient of the gender indicator remains negative and is significant at the 5% level, consistent with results in column (1). The regression results also suggest that both the age of CFO (CFOAGE) and board size (BSIZE) have a significantly negative coefficient, which is consistent with existing findings in the literature that older people are more risk averse than younger ones and smaller boards provide better corporate governance.

Table 5 presents multivariate test results for H2A and H3A. The dependent variables are measures of real earnings management, namely abnormal production costs (ABPCOST) in columns (1) and (2), and abnormal discretionary expenditures (ABDEXPN) in columns (3) and (4). Estimated coefficients presented in columns (1) and (2) show that female CFOs are less likely to engage in overproduction than their

male counterparts, as indicated by the significantly negative coefficient of the gender indicator, FEMALE. Results in columns (3) show that the coefficient of gender indicator is significantly positive, indicating that female CFOs are less likely to engage in reducing discretionary expenses to boost earnings than their male counterparts. The coefficient of the gender indicator remains significant after controlling for ownership structure, corporate governance, year and firm fixed effects, as shown in column (4) of Table 5.

(Table 5 here)

Table 6 presents multivariate test results for hypothesis H2A1, focusing on manufacturing industries. For comparison purpose, we present test results for abnormal discretionary expenses (ABDEXPN) as well as for abnormal production costs (ABPCOST). As shown in columns (1) and (2), the coefficient of gender indicator (female) is negative and significant at the 1% level, consistent with Roychowdhury (2006).[14] This finding supports hypothesis H2A1 that female CFO firm-years exhibit significantly lower abnormal production costs than male CFO firm-years in the manufacturing industry. The results concerning abnormal production costs (ABPCOST) seem to be more pronounced in the manufacturing industries than in the overall sample. Specifically, the estimated β_1 from the sample of manufacturing industries is significant at the 1% level and is twice the magnitude of β_1 estimated with the whole sample firms at a significance level of 5%.

(Table 6 here)

[14] Roychowdhury (2006) employs a regressor that interacts with the dummy for the suspect firms and the manufacturing industry dummy. We obtain the same results with an interaction variable equal to gender dummy (female) times the dummy for the manufacturing industry.

4.3 Univariate tests: H1B and H2B

Our sample consists of 333 male-to-male CFO transitions (MM) and 102 male-to-female CFO transitions (MF). Table 7 presents our univariate test results based on the mean difference-in-difference approach. Rows (1) – (3) present after/before mean differences of the three earnings management measures for male-to-male (MM) CFO transitions. Specifically, row (1) indicates when the departing and succeeding CFOs are both male, discretionary accruals as percent of assets reduces by 1.98% from year (t-1) to year (t+1), while row (3) shows that abnormal discretionary expenses as percent of assets increases by 1.00%. Both are statistically significant. Row (2) suggests that abnormal production costs have no significant changes from year (t-1) to year (t+1). On the other hand, results presented in rows (4) – (6) for male-to-female (MF) CFO transitions show no significant difference in earnings management surrounding this type of transition.

(Table 7 here)

We are more interested in results presented in rows (7) – (9) in Table 7 that show the between-sample mean differences (MF-MM) of the three earnings management measures. Both rows (7) and (9) show that male new CFOs are more aggressive than female new CFOs in managing down earnings in year (t+1), which is consistent with our proposed hypotheses. More specifically, new male CFOs reduce discretionary accruals by an average of 4.26% of total assets and raise discretionary expenses by an average of

1.67% of total assets more than by their female counterparts. Both are significant at the 5 percent level.

4.4 Mutivariate tests: H1B and H2B

Similar to multivariate tests on hypotheses H1A to H3A, we conduct multivariate regression analysis on the differences to control for the possible influence of changes in the control variables. We employ the following generic difference regression model:

$$\Delta EM = \beta_0 + \beta_1 MF + \Sigma\gamma_j \Delta X_j + \varepsilon \qquad (8)$$

where ΔEM is the change of earnings management from year (t-1) to year (t+1), MF is a dummy variable that equals one if the CFO transition is male-to-female and equals zero if the CFO transition is male-to-male, and ΔX_j is the change of control variable j from year (t-1) to year (t+1). The variable of interest in the regression is MF. If the hypotheses H1B and H2B are correct, then we would expect the coefficient of MF, β_1, to be positive for H1B and negative for H2B.

Table 8 presents the difference regression results for change of discretionary accruals (ΔDCAC) in columns (1) and (2), and change of abnormal discretionary expenditures (ΔABDEXPN) in columns (3) and (4). The results show that the coefficient of MF, β_1, is positive in columns (1) and (2), significant at the 5 percent level. The results also show that the coefficient of MF, β_1, is negative in columns (3) and (4), significant at the 10 percent level. These results confirm our hypotheses H1B and H2B in that male CFOs are more aggressive than their female counterparts to intentionally

manage down earnings by reducing discretionary accruals and increasing discretionary expenditures during the first year of their tenure.

(Table 8 here)

5. CONCLUSIONS

In this paper, we study the relation between CFO gender and risk preference where risk preference is proxied by several earnings management measures. Earnings management represents a risk-return tradeoff for CFOs who engage in it. A risk averse CFO manages earnings less often and less intensely than a risk taking CFO. Our study is based on theoretical, empirical, and experimental findings in sociology, psychology, and economics that women are more risk averse than men.

We perform a cross-sectional analysis and find that female CFO firm-years have significantly lower discretionary accruals, lower abnormal production costs, and higher abnormal discretionary expenses than male CFO firm-years. We further find that firms with male CFOs in the manufacturing industries incur significantly higher abnormal production costs than firms with female CFOs. In addition, we apply a difference-in-difference framework to a subsample of male-to-male versus male-to-female CFO transitions. We find that male new CFOs are more aggressive than female new CFOs in managing down earnings in the first year of their tenure as CFO by reducing discretionary accruals and/or increasing discretionary expenses. The explanation for this finding is that new CFOs intentionally manage down earnings in the first year in order to take bigger credit for any subsequent performance improvement and that male new CFOs are more aggressive than female new CFOs in doing so.

On a broader sense, our paper contributes to the inter-discipline literature of gender and risk preferences. Prior research on gender and risk preferences in sociology, psychology, and economics focus on individuals' gender and risk, and most of them are experimental in nature. Our paper is among the first to study gender and risk in a corporate setting. Specifically, we employ earnings management measures as proxy for risk aversion by a corporate CFO, the chief corporate executive responsible for financial reporting and operational decisions.

Our paper adds to the academic dialogue that focuses on the gender of corporate executives and corporate risk taking. If future research provides corroborating evidence that female executives are indeed more risk averse and more ethical than male executives, a risk-averse board may intentional target female candidates who have comparable credentials. This dialogue will help bring a bigger question into focus: Would it have made any difference in the current financial crisis if more female executives were making corporate decisions?

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Table 1: CFO by Year and by Industry

The sample includes all publicly listed firms in China from 1999-2006 that have name and gender of the CFO and the required financial and governance information. Panel A presents CFOs by year and gender. For each year, the number (N) and percentages of female CFOs and male CFOs are provided. Panel B presents CFOs by gender and industry. For each industry, the number (N) and percentages of female CFOs and male CFOs are provided.

Panel A: CFO by year

	female CFO		male CFO		
Year	N	%	N	%	Total
1999	158	29%	395	71%	553
2000	232	31%	510	69%	742
2001	232	27%	643	73%	875
2002	259	27%	709	73%	968
2003	287	28%	749	72%	1036
2004	307	27%	828	73%	1135
2005	312	27%	842	73%	1154
2006	320	27%	881	73%	1201
Total	2107		5557		7664

Panel B: CFO by industry

		Full sample	female CFO		male CFO	
Industry code	Industry name	N	N	%	N	%
0001	Finance	51	21	41%	30	59%
0002	Public utility	838	222	27%	616	73%
0003	Real estate	425	83	20%	342	80%
0004	Conglomerate	692	145	21%	547	79%
0005	Manufacturing	5076	1413	28%	3663	72%
0006	Commerce/Retail	582	223	38%	359	62%
	total	7664	2107		5557	

Table 2: Summary Statistics

This table presents mean and median of the relevant variables for the female CFO subsample in column (1) and male CFO subsample in column (2), excluding financial firms and firm-year with missing values. The mean and median differences between the two subsamples are also presented in column (3). Test statistics for the significance of the mean and median difference between the two samples are presented in parenthesis. Definitions of the variables are presented in Appendix A.

		(1) Female CFO		(2) Male CFO		(3)	
		1820 firm-years		4959 firm-years		Difference = (1) - (2)	
Variable	Symbol	Mean	Median	Mean	Median	Mean (t-stat)	Median (z-stat)
Sales (RMB, million)	S	1680.45	673.02	2482.57	686.86	-802.12**	-13.84
						(-2.34)	(-0.54)
Total assets (RMB, million)	TA	2520.68	1371.36	3117.7	1407.29	-597.02**	-35.93
						(-2.20)	*(-0.92)*
Number of employees	EMPL	2746.21	1611	3480.59	1700	-734.38***	-89
						(-3.58)	*(-1.58)*
Equity market value(RMB, million)	MVE	3293.58	1848.16	3808.11	1915.33	-514.53*	-67.17
						(-1.90)	*(-1.57)*
book-to-market ratio	BM	0.452	0.402	0.450	0.394	0.002	0.008
						(0.25)	*(0.72)*
Book leverage	LEV	0.476	0.485	0.480	0.483	-0.004	0.002
						(-0.78)	(0.17)
Standard deviation	STD	0.0247	0.0243	0.0253	0.0247	-0.0006***	-0.0004**
						(-3.14)	*(-2.19)*
Sales growth	GROWTH	0.230	0.141	0.228	0.153	0.002	-0.012
						(1.25)	*(-1.31)*
Return on sales	ROS	0.023	0.054	0.019	0.055	0.004	-0.001
						(0.43)	(-0.322)
Return on assets	ROA	0.023	0.031	0.022	0.030	*0.001*	*0.001*
						(0.04)	*(0.665)*
State ownership	STATE	0.304	0.300	0.325	0.360	-0.021***	-0.060***
						(-3.02)	*(-4.17)*
Institutional ownership	INST	0.253	0.243	0.240	0.140	0.013*	0.103***
						(1.93)	*(3.72)*
Board size	BSIZE	9.62	9	9.73	9	-0.110	0
						(-1.60)	*(-0.21)*
Independent directors	INDR	2.36	3	2.39	3	-0.030	0
						(-0.85)	*(-0.22)*
CFO age	CFOAGE	44.65	44	42.19	41	2.46***	3 ***
						(12.17)	*(13.22)*

***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3: Mean and median of dependent variables

Columns (1) and (2) present the mean and median of the three earnings management measures for the female CFO subsample and male CFO subsample, respectively. Column (3) presents and tests the significance of the mean and median differences of the two subsamples. The test statistics are in the parentheses. For the definitions and estimations of the dependent variables, please see Appendix A.

		(1) Female CFO		(2) Male CFO		(3) Difference = (1) - (2)	
variable	symbol	mean	median	mean	median	mean (t-state)	median (Z-stat)
Discretionary current accruals	DCAC	-0.0197	-0.0095	-0.007	0.0042	-0.0127**	-0.0137***
						(-2.20)	*(-2.68)*
Abnormal production costs	ABPCOST	-0.0056	-0.0252	0.0039	-0.0113	-0.0095	-0.0139***
						(-0.38)	*(-3.55)*
Abnormal discretionary expenses	ABDEXPN	0.0137	0.002	0.0095	0.0004	0.0042	0.0016**
						(1.40)	*(1.73)*

***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 4: Multivariate regression results for current accruals management
This table presents multivariate OLS regression results for accounting accruals management. The dependent variable is discretionary current accruals (DCAC). Two specifications of the model are estimated. The t-statistics of the coefficients are in the parentheses. See Appendix A for definitions of the variables.

	(1)	(2)
INTERCEPT	0.536***	0.0630***
	(9.18)	*(8.18)*
FEMALE	**-0.013*** **	**-0.011** **
	(-2.48)	***(-2.06)***
LOGTA	-0.029***	-0.018***
	(-4.26)	*(-2.60)*
BM	-0.030***	-0.064***
	(-3.19)	*(-5.55)*
LEV	-0.467***	-0.487***
	(-32.36)	*(-32.83)*
CFFO	-0.573***	-0.587***
	(-20.61)	*(-20.99)*
GROWTH	-0.000	-0.000
	(-0.11)	*(-0.30)*
LAGROA	-0.004	0.004
	(-0.11)	*(0.10)*
STATE		-0.035**
		(-2.04)
INST		-0.024
		(-1.33)
BSIZE		-0.002*
		(-1.85)
INDR		0.012
		(0.30)
DUALITY		0.001
		(0.13)
CFOAGE		-0.032**
		(-2.30)
Year fixed effects	no	yes
Firm fixed effects	no	yes
N	5474	5474
Adj. R^2	0.228	0.233

***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 5: Multivariate Regression results for real earnings management

This table presents multivariate OLS regression results for real earnings management measures. The dependent variables are abnormal production costs (ABPCOST) in columns (1) and (2), and abnormal discretionary expenditures (ABDEXPN) in columns (3) and (4). Two specifications for each dependent variable are estimated. The t-stats of the coefficients are in the parentheses. See Appendix A for definitions of the variables.

	ABPCOST		ABDEXPN	
	(1)	(2)	(3)	(4)
INTERCEPT	0.018	-0.012	-0.230***	-0.265***
	(0.26)	*(-0.13)*	*(-10.33)*	*(-9.11)*
FEMALE	**-0.014****	**-0.014****	**0.005****	**0.003***
	(-2.23)	***(-2.28)***	***(2.36)***	***(1.69)***
LOGTA	-0.011	-0.008	0.028***	0.030***
	(-1.41)	*(-0.93)*	*(11.04)*	*(10.98)*
BM	0.001	0.018	-0.026***	-0.038***
	(0.04)	*(1.31)*	*(-7.25)*	*(-8.76)*
LEV	0.169***	0.176***	-0.011**	-0.017***
	(10.06)	*(10.12)*	*(-1.97)*	*(-3.08)*
LAGROA	-0.016	-0.012	-0.197***	--0.197***
	(-0.39)	*(-0.30)*	*(-14.69)*	*(-14.69)*
STATE		-0.009		-0.044***
		(-0.43)		*(-6.76)*
INST		0.008		-0.041***
		(0.37)		*(-5.90)*
BSIZE		-0.003**		-0.000
		(-2.06)		*(-0.22)*
INDR		0.035		-0.002
		(0.76)		*(-0.13)*
DUALITY		0.002		0.005*
		(0.24)		*(1.90)*
CFOAGE		0.000		0.015***
		(0.01)		*(2.73)*
Year fixed effects	no	yes	no	yes
Firm fixed effects	no	yes	no	yes
N	5474	5474	5474	5474
Adj. R^2	0.023	0.024	0.050	0.061

***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 6: Real earnings management in the manufacturing industry
This table presents multivariate OLS regression results for the manufacturing industry. The dependent variables are abnormal production costs (ABPCOST) in columns (1) and (2), and abnormal discretionary expenditures (ABDEXPN) in columns (3) and (4). Two specifications for each dependent variable are estimated. The t-stats of the coefficients are in the parentheses. See Appendix A for definitions of the variables.

	ABPCOST		ABDEXPN	
	(1)	(2)	(3)	(4)
INTERCEPT	0.079	0.017	-0.136***	-0.167***
	(1.03)	*(0.17)*	*(-4.98)*	*(-4.65)*
FEMALE	**-0.028*** **	**-0.029*** **	-0.001	-0.002
	(-3.96)	***(-4.07)***	*(-0.40)*	*(-0.81)*
LOGTA	-0.016*	-0.015	0.016***	0.017***
	(-1.87)	*(-1.57)*	*(5.13)*	*(5.24)*
BM	0.006	0.014	-0.020***	-0.029***
	(0.46)	*(0.96)*	*(-4.58)*	*(-5.45)*
LEV	0.153***	0.157***	0.015**	0.010
	(7.81)	*(7.80)*	*(2.20)*	*(1.42)*
LAGROA	-0.053	-0.046	-0.028	-0.029
	(-1.07)	*(-0.92)*	*(-1.58)*	*(-1.62)*
STATE		-0.021		-0.034***
		(-0.91)		*(-4.16)*
INST		0.008		-0.027***
		(0.33)		*(-3.09)*
BSIZE		-0.001		0.000
		(-0.59)		*(0.85)*
INDR		0.089*		0.012
		(1.66)		*(0.62)*
DUALITY		0.015		0.003
		(1.45)		*(0.77)*
CFOAGE		0.008		0.008
		(0.45)		*(1.21)*
Year fixed effect	no	yes	no	yes
Firm fixed effect	no	yes	no	yes
N	3612	3612	3612	3612
Adj. R^2	0.025	0.028	0.013	0.018

***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 7: Difference-in-difference: Univariate tests

This table presents the mean of the three earnings management measures (DCAC, ABPCOST, and ABDEXPN) at time (t-1) and (t+1). Time t is the year of CFO turnover. Two types of CFO turnovers are presented: male-to-male (MM) and male-to-female (MF). First, in-sample before/after mean differences are taken (rows 1-6). Then inter-sample mean differences are taken (rows 7-9). The t-test statistics are in the parentheses.

	before (t-1)	after (t+1)	**Difference = after - before**
Male-to-male CFO transition (MM) N=333			
(1) Discretionary current accruals (DCAC)	0.0025	-0.0173	-0.0198 **
			(-2.22)
(2) Abnormal production costs (ABPCOST)	0.0451	0.0057	-0.0394
			(-0.73)
(3) Abnormal discretionary expenses (ABDEXPN)	0.0031	0.0131	0.0100 ***
			(2.63)
Male-to-female CFO transition (MF) N=102			
(4) Discretionary current accruals (DCAC)	-0.0087	0.0141	0.0228
			(1.25)
(5) Abnormal production costs (ABPCOST)	-0.0114	0.0083	0.0197
			(0.53)
(6) Abnormal discretionary expenses (ABDEXPN)	0.0167	0.0100	-0.0067
			(-1.15)
Difference = MF – MM			**Difference-in-difference**
(7) Discretionary current accruals (DCAC)	-0.0112	0.0314	**0.0426 ** **
			(2.24)
(8) Abnormal production costs (ABPCOST)	-0.0565	0.0026	0.0591
			(0.55)
(9) Abnormal discretionary expenses (ABDEXPN)	0.0136	-0.0031	**-0.0167 ** **
			(-2.21)

***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 8: Multivariate difference regression on earnings management

This table presents OLS difference regression results for the CFO turnover subsample. Columns (1) and (2) present results for the change of discretionary current accruals as dependent variables [ΔDCAC = DCAC(t+1) – DCAC(t-1)]. Columns (3) and (4) present regression results for the change of abnormal discretionary expenditures as dependent variable [ΔABDEXPN=ABDEXPN(t+1) – ABDEXPN(t-1)]. Year t is the year of CFO turnover. Two specifications for each dependent variable are estimated. The t-test statistics of the coefficients are in the parentheses. See Appendix A for variable definitions.

	ΔDCAC		ΔABDEXPN	
	(1)	(2)	(3)	(4)
INTERCEPT	-0.0112	-0.0336	0.0182 *	0.0191 *
	(-0.45)	*(-1.26)*	*(1.92)*	*(1.84)*
MF	**0.0411 ****	**0.0432 ****	**-0.0124 ***	**-0.0134 ***
	(2.17)	***(2.27)***	***(-1.73)***	***(-1.84)***
ΔLOGTA	0.0054	0.0059	-0.0008	-0.0006
	(0.85)	*(0.93)*	*(-0.35)*	*(-0.25)*
ΔBM	-0.0370	-0.0383	-0.0180	-0.0192
	(-0.97)	*(-1.00)*	*(-1.28)*	*(-1.35)*
ΔLEV	-0.0038	0.0014	-0.0174	-0.0186
	(-0.08)	*(0.03)*	*(-1.03)*	*(-1.10)*
ΔCFFO	-0.2208 ***	-0.2057 **		
	(-2.73)	*(-2.52)*		
ΔGROWTH	-0.0011	-0.0014		
	(-0.92)	*(-1.17)*		
ΔROA	0.2834 ***	0.2897 ***	-0.2295 ***	-0.2316 ***
	(3.14)	*(3.21)*	*(-7.09)*	*(-7.12)*
ΔSTATE		-0.1352		0.0054
		(-1.35)		*(0.15)*
ΔINST		-0.1654 *		0.0293
		(-1.78)		*(0.87)*
ΔBSIZE		-0.0065 *		-0.0011
		(-1.65)		*(-0.76)*
ΔINDDIR		0.0863		0.0097
		(1.39)		*(0.41)*
ΔAGE		*-0.0009*		0.0002
		(-1.27)		*(0.93)*
N	435	435	435	435
Adj. R^2	0.037	0.044	0.122	0.119

***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Appendix A: Variable definition and descriptions

Firm size (LOGTA)	Logarithm of total assets
Market value of equity (MVE):	year-end total number of common shares outstanding times year-end stock price per share
Book-to-market ratio (BM)	book equity divided by market value of equity
Book leverage (LEV)	total book debt divided by total book assets
Standard deviation (STD)	standard deviation of daily stock returns over a one-year period
Return on sales (ROS)	net income after tax divided by sales
Return on assets (ROA)	net income after tax divided by total book assets
Sales growth (GROWTH)	sales growth over the previous year
State ownership (STATE)	total number of shares owned by the state divided by total number of shares outstanding
Institutional ownership (INST)	total number of shares owned by non-state institutions divided by total number of shares outstanding
Board size (BSIZE)	number of directors on the board
Independent directors (INDR)	number of non-executive directors divided by total number of directors on the board
CFO age (CFOAGE)	logarithm of CFO age
Duality (DUALITY)	CEO and chairman of the board are the same person
Cash flow from operations (CFFO)	cash flow from operating activities, Cash Flow Statement item, scaled by lagged total assets
Current accruals (CAC)	noncash current assets minus current liabilities excluding the current portion of long-term debt, scaled by lagged total assets
Production costs (PCOST)	equals costs of goods sold (COGS) plus change in inventory, scaled by lagged total assets
Discretionary expenditures (DEXPN)	R&D plus SG&A expenses, scaled by lagged total assets
Discretionary current accruals (DCAC)	actual current accruals minus predicted current accruals as estimated by model (1)
Abnormal production costs (ABPCOST)	actual production costs minus predicted production costs as estimated by model (2)
Abnormal discretionary expenditures (ABDEXPN)	actual discretionary expenditures minus predicted discretionary expenditures as estimated by model (3)