CFO Promotion-Based Incentives and Earnings Management

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Abstract

This study examines whether CFO promotion-based incentives induce opportunistic reporting activities. We find that CFO promotion-based incentives, measured by the pay gap between the CEO and the CFO, are positively associated with accruals management and accounting misconduct in the pre-SOX period and the probability of meeting or beating analysts' forecasts in both the pre- and post-SOX periods. Further analysis shows that CFO promotion-based incentives are negatively associated with real earnings management in both the pre- and post-SOX periods. In addition, we find some evidence that the association between CFO promotion-based incentives and opportunistic reporting activities is stronger before CEO turnovers. We also document that CFOs engage in more opportunistic financial reporting when the pay gap between the CFO and other VPs is greater. Overall, our findings suggest that CFO promotion-based incentives may encourage CFOs to engage in opportunistic reporting activities but mitigate real earnings management.

***Keywords*:** Promotion-based Incentives, Pay Gap, CEO, CFO, Earnings Management, Executive Compensation

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I.   Introduction

Excessive CEO pay and the pay gap between the CEO and other senior executives (VPs) have attracted extensive attention from the financial media, regulators, practitioners, and academics. Tournament theory provides one explanation to rationalise the large discrepancy in pay between the CEO and VPs (Lazear and Rosen, 1981). Tournament theory states that VPs compete for promotion just as contestants compete for a fixed set of prizes in a tournament, where larger prizes result in greater efforts (Prendergast, 1999). In the context of managerial compensation, a larger pay gap between the CEO and VPs can motivate VPs to exert greater effort to compete for the CEO position. However, the literature has provided mixed evidence about whether and how VP promotion-based incentives affect firm performance and firm value.[4] Kale *et al.* (2009) find that VP promotion-based incentives, measured by the pay gap between the CEO and VPs, are positively associated with firm performance and firm value. In contrast, several studies provide evidence that large pay gaps may negatively affect firms' policies and performance (e.g. Henderson and Fredrickson, 2001; Kini and Williams, 2012; Park, 2017). For example, Kini and Williams (2012) document that the pay gap between the CEO and VPs is positively associated with riskier firm policies. Similarly, Park (2017) finds that the pay gap between the CEO and VPs is positively associated with real earnings management.

Prior studies primarily focus on the pay gap between the CEO and VPs and examine its impact on firm performance, firm value, corporate investing, financing, and operating activities (e.g. Kale *et al.*, 2009; Kini and Williams, 2012; Park, 2017; Vo and Canil, 2019). Different from these studies, we focus on the pay gap between the CEO and the CFO and investigate the impacts of CFO promotion-based incentives on firms' financial reporting activities, which fall within the domain of the CFOs' responsibilities. This is an important issue for the following reasons.

First, CFOs may stand out as irreplaceable leaders for their firms and competitive candidates for CEO positions due to their financial expertise. CFOs have superior knowledge and experience in making financial decisions; they are also responsible for raising capital and communicating firm performance to outsiders (Mian, 2001). In addition, like CEOs, CFOs are able to answer questions regarding firms' operating, financing, and investment plans from shareholders, potential investors, financial analysts, and the press. Thus, CFOs play a critical role in communications between their firms, shareholders, and other interest parties.[5] Even if CFOs are not promoted by their firms, these advantages may eventually earn them the rank of CEO elsewhere.

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[4] Prior studies use the term 'tournament incentives' (e.g. Kini and Williams, 2012), while we use the term 'promotion-based incentives' in this study.

[5] We do not argue that all CFOs are equipped with all these abilities, but an increasingly competitive global environment, such as the one we are in now, does require CFOs to be able to handle most of the functions that are currently dealt with by CEOs.

Second, since CFOs are directly responsible for financial reporting decisions, they certainly have the incentives and opportunities to manage earnings (e.g. Ge *et al.*, 2010; Jiang *et al.*, 2010).

Finally, previous studies have documented the impacts of CEO and CFO equity incentives on earnings management and largely ignored the role of CFOs' promotion-based incentives in opportunistic reporting activities. For example, prior research documents that CEO equity incentives are associated with accruals management (Bergstresser and Philippon, 2006), the probability of restatement (Burns and Kedia, 2006), and meeting or beating analysts' forecasts (Cheng and Warfield, 2005). Chava and Purnanandam (2010) find that CFO risk-aversion (-increasing) incentives are associated with higher (lower) earnings smoothing through accounting accruals. Several studies examine the relative role of CEOs and CFOs in opportunistic reporting activities, although the results appear to be mixed (Jiang *et al.*, 2010; Feng *et al.*, 2011).

In addition to the equity incentives of CFOs, we expect that the promotion-based incentives also motivate CFOs to engage in earnings management. However, promotion-based incentives may or may not be strong enough to induce CFOs to undertake earnings management. This is because, according to the consulting firm Spencer Stuart, CFOs need to improve their experience and skill sets outside the accounting and finance function to become viable candidates for CEO positions. Indeed, less than 5% of the CFOs in our sample were eventually promoted to CEO within their firms. In other words, even if CFOs have some competitive edge among VPs, they may not get promoted to CEO. Previous research shows that many CFOs left for other firms after CEO turnovers (Geiger and North, 2006).

Using data from 1993 to 2018,[6] we find that CFO promotion-based incentives are positively associated with accruals management and accounting misconduct in the pre-SOX period. We also find that CFO promotion-based incentives are positively associated with the likelihood of meeting or beating analysts' forecasts in both the pre- and post-SOX periods. Furthermore, we document that CFO promotion-based incentives are negatively associated with real earnings management in both the pre- and post-SOX periods. Our results are robust after controlling for CFO and CEO equity incentives and CEO power, measured by CEO pay slice, and CEO-Chairman duality. We also find some evidence that the association between CFO promotion-based incentives and aggressive reporting activities is stronger before CEO turnovers. Finally, we observe that CFOs engage in more opportunistic financial reporting when the pay gap between the CFO and other VPs is greater.

This study contributes to the literature in three ways. First, we extend previous studies on tournament theory and find that CFO promotion-based incentives are associated with opportunistic reporting activities. Second, we add to the literature focusing on the relative

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[6] The sample period for our accounting misconduct analysis is from 1993 to 2011.

role of CEOs and CFOs in earnings management. We note that not only the equity incentives but also the promotion-based incentives are driving CFOs to engage in opportunistic reporting activities. Finally, we document the mitigating effect of CFO promotion-based incentives on real earnings management.

The remainder of the paper is organised as follows: Section II reviews the related literature and develops our hypotheses, Section III presents our empirical design, Section VI discusses the data and our empirical results, and Section V concludes the paper.

II. Literature Review and Hypotheses Development

Previous studies have provided evidence that CFOs play a key role in financial reporting. For example, Geiger and North (2006) show that discretionary accruals decrease significantly surrounding the appointment of a new CFO, indicating that CFOs have an influence on firms' reporting quality that is significant and independent from that of CEOs. Ge *et al.* (2010) provide evidence that accounting choices are influenced by the individual characteristics of CFOs, such as their disposition, personal situation, and prior experience. In addition, Chava and Puranandam (2010) find that CFOs' risk-aversion incentives are associated with higher earnings smoothing.

The equity incentives of CEOs and CFOs to manage earnings have been widely examined in the literature. Bergstresser and Philippon (2006) find that CEO equity incentives, measured as the sensitivity of CEO wealth to a one per cent change in firms' stock price, are positively associated with the absolute value of discretionary accruals. Cheng and Warfield (2005) document that CEO equity incentives are positively related to the likelihood of meeting or beating analysts' forecasts. Burns and Kedia (2006) examine all the components of CEO compensation and find that the sensitivity of the option portfolio to stock price impacts the propensity for financial statement restatements.

Two studies examine the relative role of CEOs and CFOs in accounting manipulations. Jiang *et al.* (2010) find that CFO equity incentives are positively associated with accruals management after controlling for CEO equity incentives in the pre-SOX period. They also find that CFO equity incentives, rather than CEO equity incentives, dominate the association with meeting or beating analysts' forecasts in both the pre- and post-SOX periods. In contrast, Feng *et al.* (2011) investigate whether CFOs' involvement in material accounting manipulations is caused by the pressure from CEOs instead of CFOs' equity holdings.[7] They point out that only CEO equity incentives and CEO power, measured by CEO pay slice, CEO founder, and CEO-Chairman duality, are positively associated with the occurrence of material accounting manipulations.

Little research, however, has investigated whether CFOs' opportunistic reporting

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[7] It is defined as whether CEOs or CFOs were included in the SEC's Accounting and Auditing Enforcement Releases.

behaviour is related to their promotion-based incentives. Tournament theory predicts that, just like a sports game, larger promotion prizes lead to greater effort to win the prizes in firms (Prendergast, 1999). Lazear and Rosen (1981) use tournament theory to examine the incentives generated by the pay gap among different ranks of contestants in the firm. Green and Stokey (1983) also use tournament theory to examine the incentives provided by promoting workers to positions of different rank. A growing body of literature has studied VP promotion-based incentives, which are normally measured by the pay difference between the CEO and VPs (Bognanno, 2001). Kale *et al.* (2009) find that after controlling for the CEO and VP equity incentives, VP promotion-based incentives are associated with better short- and long-term firm performance and firm value, measured by ROA and firm's Tobin's q, respectively.[8] However, due to the fierce competition between them, VPs may adopt risky policies and strategies to inflate firm performance in order to increase their chances of promotion, which can eventually jeopardise firm value (Henderson and Fredrickson, 2001; Kini and Williams, 2012; Park, 2017). Consistent with this view, Kini and Williams (2012) document that VP promotion-based incentives are positively associated with firm risk, proxied by stock return volatility, and seasonally adjusted cash flow volatility. They also find that tournament incentives are associated with higher R&D propensity, firm focus, and leverage and lower capital expenditure propensity, suggesting that VPs' tournament incentives increase firm risk through riskier operating and financing policies.[9] Park (2017) also observes a positive association between VP promotion-based incentives and real activity management.[10]

Kale *et al.* (2009) argue that promotion-based incentives arise due to the size of the pay gap between the CEO and VPs and the chance of VPs being promoted. Since CFOs are competitive candidates due to their financial expertise, they may be motivated by the large pay gap with CEOs to engage in opportunistic reporting activities in order to increase their chances of promotion. Therefore, we predict the following (in null hypothesis form):

H1a: CFO promotion-based incentives are not associated with firms' accruals management.

H1b: CFO promotion-based incentives are not associated with the likelihood of meeting or beating analysts' forecasts.

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[8]   They follow Aggarwal and Samwick (2003) to define both CEO and CFO equity incentives as (Number of shares held by the CEO or CFO + delta of options × number of options held by the CEO or CFO) / total number of shares outstanding × 100.

[9]   *Firm focus* is computed as the segment sales-based Herfindahl index. It is equal to one if the firm operates solely in one segment and decreases as the firm diversifies.

[10] Park (2017) focuses on the association between the CEO-VPs pay gap and real earnings management and decomposes the pay gap into CFO and non-CFO VPs as an additional test. The author observes a negative association between real earnings management and the long-term pay gap between the CEO and the CFO, although he fails to observe any significant association between the short-term pay gap between the CEO and the CFO and real earnings management.

H1c: CFO promotion-based incentives are not associated with the likelihood of accounting misconduct.

We also extend the analysis to real earnings management as previous studies find that real earnings management substitutes for accruals management when accruals management becomes more scrutinised following the Sarbanes-Oxley Act (Cohen *et al.*, 2008). Real earnings management affects the firm's underlying operations and may have a negative effect on the firm's long-term performance (Roychowdhury, 2006), while accruals management involves within-GAAP accounting choices which do not affect the firm's operations. Hence, the role played by CFOs in real earnings management may be different from that in accruals management. Duellman *et al.* (2013) find a negative relationship between CEO equity incentives and real earnings management, suggesting that CEO equity incentives align the CEO's and the firm's long-term interests. However, Park (2017) finds that real earnings management is positively associated with the pay gap between the CEO and VPs but negatively associated with the long-term pay gap between the CEO and the CFO. We therefore predict the following (in the form of the null hypothesis):

H2: CFO promotion-based incentives are not associated with real earnings management.

III. Empirical Design

Following Kale *et al.* (2009) and Kini and Williams (2012), we calculate CFO promotion-based incentives, *CFO_Promo_Incent,* as the natural logarithm of the pay difference between the CEO and the CFO. We follow Bergstresser and Philippon (2006) to calculate CFO equity incentives, *CFO_Equity_Incent*. We first calculate the change in the value of the CFO's stock and stock options portfolio in response to a one per cent change in stock price. When estimating the sensitivity of stock options to stock price (delta), we follow Core and Guay (2002) to estimate delta separately for newly granted options, unexercisable options, and exercisable options. We then divide it by total annual compensation to remove the size effect.

To test **H1a**, we estimate the regression (1) to examine how CFO promotion-based incentives affect accruals management:

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\begin{aligned}
|Discretionary\ Accruals| = {} & \beta_0 + \beta_1 CFO\_Promo\_Incent + \beta_2 CFO\_Equity\_Incent \\
& + \beta_3 Size + \beta_4 StdCashFlow + \beta_5 StdRev + \beta_6 StdSalesGrowth \\
& + \beta_7 Oldfirm + \beta_8 Leverage + MarketToBookDecile \\
& + G\_index + Year + Exchange + Industry + \varepsilon. \quad\quad (1)
\end{aligned}
$$

We use the modified Jones model to measure discretionary accruals.[11] We follow Bergstresser and Philippon (2006) and Jiang *et al.* (2010) in using the absolute value of discretionary accruals (|*Discretionary Accruals*|) as the dependent variable[12] to capture managerial incentives to smooth earnings and to control for firm size (*Size*), the standard deviation of cash flows from operations (*StdCashFlow*), the standard deviation of revenues (*StdRev*), the standard deviation of sales growth (*StdSalesGrowth*), firm age (*Oldfirm*), leverage (*Leverage*), deciles of the market to book ratio (*MarketToBookDecile*), governance score (*G_Index*), year indicators (*Year*), exchange indicators (*Exchange*), and industry indicators (*Industry*). We also use signed discretionary accruals to capture CFOs' incentives to report better financial performance. Appendix A provides definitions of all these variables.

To test **H1b**, we estimate the following model (2) to examine whether CFO promotion-based incentives affect the probability of meeting or beating analysts' forecasts:

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\begin{aligned}
\text{Prob } (positive\ surprise = 1) = {}& \beta_0 + \beta_1 CFO\_Promo\_Incent + \beta_2 CFO\_Equity\_Incent \\
& + \beta_3 Size + \beta_4 Growth + \beta_5 SalesGrowth + \beta_6 NOA \\
& + \beta_7 Shares + \beta_8 Litigation + \beta_9 ImplicitClaims \\
& + \beta_{10} AnalystFollowing + \beta_{11} ForecastDispersion \\
& + Year + \varepsilon \qquad\qquad\qquad\qquad\qquad (2)
\end{aligned}
$$

Following Jiang *et al.* (2010), *positive surprise* is a dummy variable which takes the value of 1 if a firm's actual annual earnings per share reported in I/B/E/S is greater than or equal to the latest analyst consensus earnings forecast from the I/B/E/S summary file, and 0 otherwise. We follow Cheng and Warfield (2005) to control for firm size (*Size*), growth option (*Growth*), sales growth (*SalesGrowth*), net operating assets (*NOA*), shares outstanding (*Shares*), litigation risk (*Litigation*), implicit claims (*ImplicitClaims*), numbers of analysts following (*AnalystFollowing*), the dispersion of the consensus forecasts

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[11] We use the modified Jones model below to estimate both non-discretionary accruals and discretionary accruals.

$ACC_{icoef.} = \beta_0 + \beta_1(1/TA_{t-1}) + \beta_2(\Delta Sales_{it} - \Delta Rec_{it}) + \beta_3(PPE_{it}) + \varepsilon_t$, where ACC_{it} is accruals deflated by beginning total assets; TA_{t-1} is beginning total assets; $\Delta Sales_{it}$ is the change in sales deflated by beginning total assets; ΔRec_{it} is the change in accounts receivable deflated by beginning total assets; PPE_{it} is gross property, plant, and equipment deflated by beginning total assets; and β_0, β_1, β_2, and β_3 are estimated cross-sectionally for each year and industry combination. We estimate non-discretionary accruals deflated by beginning total assets ($NDACC_{it}$) on the basis of these cross-sectional coefficients along with each firm's data. Discretionary accruals deflated by beginning total assets ($DACC_{it}$) are therefore ACC_{it} less $NDACC_{it}$.

[12] We use the absolute value of discretionary accruals to be consistent with previous studies (e.g. Bergstresser and Philippon, 2006; Jiang *et al.*, 2010) and to allow us to compare our results with previous studies with similar dependent variables and control variables. Our results using absolute values of abnormal accruals are generally consistent with the literature and our prediction. We also believe that to some extent, absolute values of discretionary accruals include discretionary accruals reversal. It is also likely that CFOs have considered discretionary accruals reversal when determining the magnitude of earnings management.

(*ForecastDispersion*), and year indicators (*Year*).

To test **H1c**, we estimate the following conditional logistic regression (3) to examine how CFO promotion-based incentives affect the likelihood of accounting misconduct:[13]

$$Prob\ (Misconduct = 1) = \beta_0 + \beta_1 CFO\_Promo\_Incent + \beta_2 CFO\_Equity\_Incent$$
$$+ \beta_3 \Delta Cash\_Sales + \beta_4 \Delta Earnings + \beta_5 \Delta Inventory$$
$$+ \beta_6 \Delta Receivables + \beta_7 Rsst\_Accruals + \varepsilon \qquad (3)$$

Misconduct is a dummy variable that equals 1 if the firm is charged by the SEC for accounting misconduct and 0 otherwise. Following Feng *et al.* (2011), we control for the change in cash sales (*ΔCash_Sales*), change in earnings (*ΔEarnings*), change in inventory (*ΔInventory*), change in receivables (*ΔReceivables*), and accruals (*Rsst_Accruals*).

To test *H2*, we examine whether promotion-based incentives are associated with real earnings management by estimating regression (4):

$$|RM\_Proxy| = \beta_0 + \beta_1 CFO\_PromoIncent + \beta_2 CFO\_Equity\_Incent + \beta_3 Size$$
$$+ \beta_4 StdCashFlow + \beta_5 StdRev + \beta_6 StdSalesGrowth + \beta_7 Oldfirm$$
$$+ \beta_8 Leverage + MarketToBookDecile + Year + G\_index + Exchange$$
$$+ Industry + \varepsilon \qquad (4)$$

Following Roychowdhury (2006), we estimate abnormal cash flows (*RM_CFO*), abnormal production costs (*RM_Prod*), and abnormal discretionary expenses (*RM_DiscExp*).[14] We then follow Cohen *et al.* (2008) to construct an aggregate variable (*RM_Proxy*) combining the three individual real earnings management variables. Specifically, *RM_Proxy* is the sum of the three standardised real earnings management variables (*RM_CFO*, *RM_Prod*, and *RM_DiscExp*). Prior literature provides empirical evidence that CEO incentives affect their firms' earnings management (Bergstresser and Phillippon, 2006; Cheng and Warfield, 2005; Burns and Kedia, 2006). Feng *et al.* (2011) find that CEOs who engage in material accounting manipulations are more likely to be powerful CEOs. Therefore, we also control for CEO equity incentives (*CEO_Equity_Incent*); CEO power, measured by CEO pay slice (*CEO_Payslice*); and CEO-Chairman duality

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[13] Conditional logistic regression allows for stratification and matching. It is used since the sample consists of fraud firms and control firms matched using company size, and the choice of the regression is consistent with Feng *et al.* (2011). Our results using regular logistic regression are consistent.

[14] To estimate *RM_CFO*, we run the following cross-sectional model by every industry and year to get the residual: $CFO_t/A_{t-1} = \beta_0 + \beta_1(1/A_{t-1}) + \beta_2(S_t/A_{t-1}) + \beta_3(\Delta S_t/A_{t-1}) + \varepsilon_t$, where CFO_t is the cash flow, A_{t-1} is the beginning total assets, S_t is the sales, and $\Delta S_{coef.} = S_t - S_{t-1}$.

To estimate *RM_Prod*, we first run the following cross-sectional model by every industry and year to get the residual: $Prod_t/A_{t-1} = \beta_0 + \beta_1(1/A_{t-1}) + \beta_2(S_t/A_{t-1}) + \beta_3(\Delta S_t/A_{t-1}) + \beta_4(\Delta S_{t-1}/A_{t-1}) + \varepsilon_t$, where $Prod_t$ is the sum of COGS and inventory growth.

To estimate *RM_DiscExp*, we first run the following cross-sectional model by every industry and year to get the residual: $DiscExp_t/A_{t-1} = \beta_0 + \beta_1(1/A_{t-1}) + \beta_2(S_{t-1}/A_{t-1}) + \varepsilon_t$, where $DiscExp_t$ is the discretionary expenses.

(*CEO_Chair*) in all our tests.[15]

IV. Data and Results

4.1 Data

The initial sample consists of all ExecuComp firms during the period 1993 to 2018. We identify CFOs using the data item 'titleann' in ExecuComp. We first identify any of the following phrases: CFO, chief financial officer, chief finance officer, chief accounting officer, treasurer, controller, vice president-finance, and VP-finance. If more than one person is identified as CFO (e.g. one person with the title of 'CFO' and another person with the title of 'treasurer') for the same firm in the same fiscal year, we take the person with the title 'CFO'. There are a total of 50,237 firm-years with compensation data available during the test period. We delete 8,189 observations with missing CEO or CFO. We also delete 2,530 firm-year observations with a negative pay gap following Kini and Williams (2012).[16] We remove firms in the financial sector (with SIC between 6000 and 6999) and lose observations when combining Compustat with the I/B/E/S and AAERs[17] databases, respectively. There are 28,476 firm-year observations in the final sample for model (1), 19,483 firm-year observations for model (2), and 25,573 firm-year observations for model (4).

Following Dechow *et al.* (2011), we use Accounting and Auditing Enforcement Releases (AAERs) to proxy for accounting misconduct. We delete firms that were charged with misconduct other than accounting manipulations (e.g. bribery, auditor issue, false press release, helping other companies misstate financial statements, etc.). We exclude observations without a Central Index Key (CIK), dates, financial data, or compensation data, resulting in a sample of 267 manipulation firms. We match each manipulation firm with two firms in the same industry and year and with the closest beginning total assets. Our final sample for model (3) consists of 800 firm-year observations from 1993 to 2011.

Table 1 presents descriptive statistics for the samples used in our analysis. *CFO_Promo_Incent*, which is the natural logarithm of the total pay gap between the CEO and the CFO, has a mean of 7.463 and a median of 7.556.[18] The average CFO equity

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[15] Controlling for CEO pay slice also addresses another concern that the pay gap between the CEOs and CFOs may capture the agency problem of CEOs. Bebchuk *et al.* (2011) argue that CEO pay slice may reflect CEOs' ability to extract rents.

[16] They find that a negative pay gap occurred in the companies with the CEO being the founder or receiving nominal compensation, which is not a good proxy for promotion-based incentives.

[17] According to the SEC, this public database includes financial reporting related enforcement actions concerning civil lawsuits brought by the SEC in federal court and notices and orders concerning the institution and/or settlement of administrative proceedings. For details, please refer to https://www.sec.gov/divisions/enforce/friactions.shtml.

[18] For our sample, the average and the median CEO and CFO pay gaps are $3,640,000 and $1,911,000, respectively.

Table 1   Descriptive Statistics

Variables	N	Mean	Median	Std Dev	Lower quartile	Upper quartile
|Discretionary Accruals|	28,476	0.048	0.033	0.049	0.015	0.063
CFO_Promo_Incent	28,476	7.463	7.556	1.244	6.645	8.365
CFO_Equity_Incent	28,476	0.085	0.053	0.095	0.022	0.110
CEO_Equity_Incent	28,476	0.200	0.128	0.204	0.057	0.266
CEO_Chair	28,476	0.558	1.000	0.497	0	1.000
CEO_PaySlice	28,476	0.394	0.390	0.104	0.325	0.455
VP_CFO_Ratio	26,832	1.043	0.983	0.452	0.767	1.223
Size	28,476	7.298	7.196	1.612	6.120	8.372
StdCashFlow	28,476	0.048	0.035	0.043	0.021	0.058
StdRev	28,476	0.147	0.105	0.136	0.060	0.185
StdSalesGrowth	28,476	0.206	0.125	0.281	0.067	0.229
Oldfirm	28,476	0.569	1.000	0.495	0	1.000
Leverage	28,476	0.531	0.533	0.229	0.374	0.673
Positive Surprise	19,483	0.710	1.000	0.454	0	1.000
Size_BM	19,483	7.623	7.506	1.554	6.475	8.635
Growth	19,483	0.473	0.409	0.344	0.249	0.617
SalesGrowth	19,483	1.222	1.066	1.147	0.980	1.169
NOA	19,483	0.808	0.599	0.709	0.350	1.000
Shares	19,483	4.346	4.138	1.183	3.468	5.075
Litigation	19,483	0.265	0	0.441	0	1.000
ImplicitClaims	19,483	0.457	0.558	0.387	0.194	0.772
AnalystFollowing	19,483	11.033	9.000	7.377	5.000	15.000
ForecastDispersion	19,483	0.020	0.013	0.102	0.006	0.030
Misconduct	800	0.334	0	0.472	0	1.000
ΔCash_Sale	800	0.174	0.090	0.364	-0.005	0.251
ΔIB	800	0.000	0.006	0.100	-0.022	0.034
ΔInvt	800	0.008	0.000	0.035	-0.002	0.017
ΔRect	800	0.014	0.010	0.051	-0.007	0.038
Rsst_Accruals	800	0.050	0.034	0.169	-0.022	0.106
RM_Proxy	25,573	-0.037	-0.022	0.109	-0.057	0.005
RM_CFO	25,573	-0.097	-0.065	0.390	-0.164	0.008
RM_Prod	25,573	-0.111	-0.068	0.404	-0.199	0.038
RM_DisExp	25,573	-0.031	-0.004	1.005	-0.184	0.142

Variable definitions are presented in Appendix A.

incentives and CEO equity incentives are 0.085 and 0.200, respectively. The equity incentives (delta) statistics are comparable to those of Jiang *et al.* (2010) and Bergstresser and Philippon (2006).[19] Among the top five executives reported in the Execucomp

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[19] Jiang *et al.* (2010) document that CEOs' and CFOs' average equity incentives during the sample period (1993-2006) are 0.236 and 0.105, respectively. Bergstresser and Philippon (2006) report average CEO equity incentives of 0.244 for the period 1993 to 2000.

database,[20] CEO pay slice is approximately 39.4%. On average, CEOs are also the Chairman of the Board of Directors in 55.8% of firm-year observations. The mean for the absolute value of discretionary accruals (|*Discretionary Accruals*|) is 0.048. Approximately 71% of our sample firms have their annual reported earnings meeting or beating analysts' consensus forecasts during the test period. The mean of *Misconduct,* which equals 1 if the firm is charged by the SEC for accounting manipulations and 0 otherwise, is 0.334 for our matched sample used for the accounting misconduct analysis. As to the main variables for the real earnings management test, the means of *RM_CFO, RM_Prod,* and *RM_DisExp* are -0.097, -0,111, and -0.031 respectively. The mean of *RM_Proxy,* which is the standardised sum of the three real earnings management proxies (*RM_CFO*, *RM_Prod*, and *RM_DiscExp*), is -0.037.

4.2 Accruals Management Analysis

Panel A of Table 2 presents the Pearson correlations among the variables used in our accruals management analysis. CFO promotion-based incentives (*CFO_Promo_Incent*) and CFO equity incentives (*CFO_Equity_Incent*) are positively correlated, with a coefficient of 0.215, suggesting that these measures are related but capture different aspects of CFO incentives. CFO equity incentives (*CFO_Equity_Incent*) and CEO equity incentives (*CEO_Equity_Incent*) are highly correlated, with a coefficient of 0.522, indicating that the equity incentives of the CEO and the CFO are aligned. |*Discretionary Accruals*| are negatively correlated with *CFO_Promo_Incent* and positively correlated with *CEO_Equity_Incent* but are not correlated with *CFO_Equity_Incent.* Since the correlation analysis only considers the correlation between the dependent (|*Discretionary Accruals*|) and the independent (*CFO_Promo_Incent*) variable without controlling for the effects of other independent variables, we focus on the results of the multivariate analysis.[21]

Panel B of Table 2 reports the ordinary least square regression results of estimating equation (1). Cohen *et al.* (2008) suggest that firms may switch from accrual-based earnings management to real earnings management after the Sarbanes-Oxley Act (2002). As such, we follow Jiang *et al.* (2010) and partition our sample into two time periods, with the pre-SOX period running from 1993 to 2001 and the post-SOX period running from 2002 to 2018, and estimate equation (1) for each period separately. The results for the pre-SOX period are reported in columns (1) to (4), and the results for the post-SOX period are reported in columns (5) to (8). In column (1), we only include *CFO_Equity_Incent,* and we find that the

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[20] If Execucomp database discloses more than five executives, we only consider the five highest-paid executives. If Execucomp discloses less than five executives, we assume the undisclosed executives receive the same pay as the lowest-paid executive disclosed.

[21] |*Discretionary Accruals*| are negatively correlated with *CFO_Promo_Incent*; however, in our multivariate analysis, |*Discretionary Accruals*| are positively related with *CFO_Promo_ Incent*. According to Falk and Miller (1992), when the regression coefficient and the correlation do not have the same sign, one of the reasons is real suppression, which means an important independent variable suppresses the effect of another independent variable.

Table 2
Panel A   Pearson correlations of main variables for the accruals management test

	|Discretionary Accruals|	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11
V1	CFO_Promo_Incent	**-0.095**											
V2	CFO_Equity_Incent	0.006	**0.215**										
V3	CEO_Equity_Incent	**0.027**	**0.141**	**0.522**									
V4	CEO_Chair	-0.017	**0.101**	**0.089**	**0.212**								
V5	CEO_PaySlice	**-0.034**	**0.625**	0.049	-0.001	0.065							
V6	VP_CFO_Ratio	-0.001	-0.061	0.066	-0.082	-0.052	**0.290**						
V7	Size	**-0.239**	**0.613**	**0.185**	**0.088**	**0.154**	**0.167**	-0.020					
V8	StdCashFlow	**0.295**	**-0.178**	-0.055	-0.027	**-0.095**	**-0.071**	-0.018	**-0.423**				
V9	StdRev	**0.236**	**-0.110**	-0.042	-0.020	-0.044	-0.036	0.002	**-0.244**	**0.396**			
V10	StdSalesGrowth	**0.158**	-0.067	0.018	0.017	-0.055	-0.038	-0.017	**-0.175**	**0.432**	**0.241**		
V11	Oldfirm	**-0.139**	**0.152**	-0.024	**-0.103**	0.093	**0.073**	0.016	**0.356**	**-0.234**	**-0.159**	**-0.194**	
V12	Leverage	-0.035	**0.190**	**-0.075**	**-0.152**	0.079	**0.085**	0.013	**0.394**	**-0.120**	0.008	-0.087	**0.186**

Correlations significant at the 5% level or less appear in bold. All variables are defined in Appendix A.

Panel B OLS regression of the absolute value of discretionary accruals on the CFO promotion-based incentives

| | Dependent Variable = $|Discretionary\ Accruals|$ | | | | | | | |
| | pre-SOX | | | | post-SOX | | | |
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.032	0.020	0.020	0.017	0.056	0.055	0.055	0.055
	(0.02)	(0.17)	(0.17)	(0.21)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
CFO_Promo_Incent		0.003	0.003	0.005		0.000	0.000	0.001
		(<0.01)	(<0.01)	(<0.01)		(0.42)	(0.41)	(0.06)
CFO_Equity_Incent	0.018		0.015	0.005	0.010		0.010	0.007
	(0.05)		(0.09)	(0.59)	(0.03)		(0.03)	(0.15)
CEO_Equity_Incent				0.011				0.004
				(0.02)				(0.11)
CEO_Chair				0.002				0.001
				(0.14)				(0.40)
CEO_PaySlice				-0.026				-0.009
				(<0.01)				(0.06)
Size	-0.004	-0.005	-0.006	-0.007	-0.004	-0.004	-0.004	-0.004
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
StdCashFlow	0.172	0.164	0.166	0.168	0.184	0.183	0.184	0.184
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
StdRev	0.050	0.049	0.049	0.048	0.030	0.030	0.030	0.030
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
StdSalesGrowth	0.005	0.005	0.005	0.004	0.004	0.004	0.004	0.004
	(0.07)	(0.09)	(0.11)	(0.20)	(0.10)	(0.10)	(0.11)	(0.11)
Oldfirm	-0.003	-0.003	-0.003	-0.002	-0.001	-0.001	-0.001	-0.001
	(0.08)	(0.08)	(0.12)	(0.18)	(0.41)	(0.43)	(0.43)	(0.50)
Leverage	0.027	0.026	0.025	0.025	0.009	0.009	0.009	0.009
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
R^2	17.53%	17.80%	17.84%	18.10%	12.52%	12.49%	12.52%	12.57%
No. of Observations	8,266	8,266	8,266	8,266	20,210	20,210	20,210	20,210

All variables are defined in Appendix A. The two-tailed p-values are presented in parentheses and are computed using heteroskedasticity robust standard errors, clustered by firm. All continuous variables are winzorised at 1% and 99% to mitigate the effect of outliers. For the sake of brevity, we do not report coefficient estimates for market-to-book decile indicators, year indicators, exchange indicators, G index dummies, and the Fama and French (1997) industry indicators.

coefficient on *CFO_Equity_Incent* is significantly positive (coefficient = 0.018, p = 0.05), which is consistent with prior research indicating that CFO equity incentives are positively associated with accruals management (Jiang *et al.*, 2010). The coefficients on other control variables are all significant at conventional levels and in the predicted directions. We then test whether CFO promotion-based incentives affect discretionary accruals. In column (2), we find that the coefficient on *CFO_Promo_Incent* is significantly positive (coefficient = 0.003, p < 0.01), suggesting that CFO promotion-based incentives are positively associated with accruals management. Column (3) reports the results when both *CFO_Promo_Incent* and *CFO_Equity_Incent* are included. We find that the coefficients on both *CFO_Promo_Incent* (coefficient = 0.003, p < 0.01) and *CFO_Equity_Incent* (coefficient = 0.015, p = 0.09) continue to be significantly positive. Column (4) shows that *CFO_Promo_Incent* continues to be positive and significant, although *CFO_Equity_Incent* is no longer significant after controlling for CEO equity incentives, CEO pay slice, and CEO-Chairman duality. In fact, we find that *CEO_Equity_Incent* (coefficient = 0.011, p = 0.02) subsumes *CFO_Equity_Incent* in the pre-SOX period.

In the post-SOX period, we observe that the coefficient on *CFO_Promo_Incent* is significantly positive in column (8) only (coefficient = 0.001, p = 0.06). However, the coefficients on *CFO_Equity_Incent* and *CEO_Equity_Incent* are insignificant in column (8). We find weak results for the post-SOX period. One possible explanation is that CEOs and CFOs have become more conservative since SOX Section 302 requires CEOs and CFOs to take personal responsibility for their firms' financial reporting.

The absolute value of discretionary accruals is used to capture earnings smoothness, assuming that boards of directors expect CFOs to deliver more consistent accounting performance. However, it is also likely that CFOs are expected to deliver better accounting performance. As a result, we should observe a significant positive relation between signed discretionary accruals and CFO promotion-based incentives. Untabulated results show that signed discretionary accruals are not associated with CFOs' promotion-based incentives, suggesting that CFOs do not necessarily engage in earnings management through income-increasing accruals to increase their chance of getting promoted to CEO.

4.3 Meeting or Beating Analysts' Forecasts

Panel A of Table 3 presents the Pearson correlations among the variables used in our logistic analysis of meeting or beating analysts' forecasts. *Positive Surprise* is positively correlated with *CFO_Promo_Incent and CFO_Equity_Incent,* suggesting that both CFO promotion-based incentives and CFO equity incentives are positively correlated with the likelihood of meeting or beating analysts' forecasts.

Panel B of Table 3 reports the effect of CFO promotion-based incentives on the likelihood of meeting or beating analysts' forecasts. Column (1) shows that the coefficient on *CFO_Equity_Incent* (coefficient = 1.394, p < 0.01) is significantly positive, which is

Table 3

Panel A   Pearson correlations of main variables for the meeting or beating analysts' forecasts test

	Positive Surprise	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14
V1 CFO_Promo_Incent	**0.086**														
V2 CFO_Equity_Incent	**0.072**	**0.216**													
V3 CEO_Equity_Incent	**0.068**	**0.133**	**0.511**												
V4 CEO_Chair	0.016	**0.094**	**0.079**	**0.212**											
V5 CEO_PaySlice	0.032	**0.612**	0.044	-0.011	**0.066**										
V6 VP_CFO_Ratio	0.014	-0.072	**0.072**	-0.088	-0.052	**0.289**									
V7 Size_BM	**0.038**	**0.622**	**0.216**	**0.110**	**0.142**	**0.147**	-0.035								
V8 Growth	-0.053	-0.171	-0.233	-0.210	-0.016	-0.045	0.028	-0.054							
V9 SalesGrowth	0.021	**0.053**	0.043	0.019	0.026	-0.005	-0.022	**0.103**	-0.014						
V10 NOA	-0.043	**0.075**	0.019	-0.024	0.011	0.014	0.013	**0.264**	**0.220**	0.029					
V11 Shares	**0.063**	**0.577**	**0.229**	**0.157**	**0.080**	**0.095**	-0.058	**0.833**	-0.169	**0.093**	**0.168**				
V12 Litigation	**0.073**	-0.031	0.016	**0.093**	-0.081	-0.054	-0.042	-0.162	-0.048	-0.010	-0.182	-0.003			
V13 ImplicitClaims	**0.095**	**0.047**	**0.084**	**0.117**	-0.075	-0.002	0.017	-0.153	-0.143	0.005	-0.270	-0.066	**0.141**		
V14 AnalystFollowing	**0.089**	**0.450**	**0.310**	**0.265**	**0.090**	**0.052**	-0.073	**0.602**	-0.223	**0.085**	**0.130**	**0.669**	**0.103**	-0.073	
V15 ForecastDispersion	-0.036	-0.021	-0.026	-0.016	0.004	-0.007	0.007	0.000	0.001	-0.000	0.017	-0.024	-0.019	-0.024	-0.021

Correlations are significant at the 5% level or lower appear in bold. All variables are defined in Appendix A.

Panel B　Logistic analysis of the likelihood of meeting or beating analysts' forecasts on the CFO promotion-based incentives

	Dependent Variable = *Positive Surprise*							
	pre-SOX				post-SOX			
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.498	-0.154	-0.174	-0.256	0.210	-0.366	-0.354	-0.366
	(0.07)	(0.65)	(0.61)	(0.47)	(0.21)	(0.07)	(0.08)	(0.07)
CFO_Promo_Incent		0.167	0.156	0.188		0.121	0.118	0.134
		(<0.01)	(<0.01)	(<0.01)		(<0.01)	(<0.01)	(<0.01)
CFO_Equity_Incent	1.394		1.167	0.860	0.828		0.779	0.611
	(<0.01)		(0.03)	(0.15)	(<0.01)		(<0.01)	(0.04)
CEO_Equity_Incent				0.303				0.158
				(0.21)				(0.25)
CEO_Chair				0.020				0.065
				(0.81)				(0.16)
CEO_PaySlice				-0.366				-0.224
				(0.46)				(0.46)
Size	0.086	0.030	0.046	0.053	-0.015	-0.051	-0.060	-0.069
	(0.09)	(0.55)	(0.36)	(0.31)	(0.59)	(0.09)	(0.05)	(0.03)
Growth	-0.143	-0.154	-0.127	-0.115	-0.055	-0.063	-0.025	-0.017
	(0.17)	(0.14)	(0.22)	(0.27)	(0.41)	(0.34)	(0.71)	(0.80)
SalesGrowth	0.030	0.030	0.030	0.030	0.038	0.037	0.036	0.037
	(0.19)	(0.18)	(0.17)	(0.17)	(0.09)	(0.10)	(0.11)	(0.10)
NOA	-0.059	-0.046	-0.053	-0.055	-0.073	-0.059	-0.062	-0.059
	(0.28)	(0.40)	(0.34)	(0.32)	(0.04)	(0.10)	(0.09)	(0.09)
Shares	-0.113	-0.117	-0.143	-0.165	0.032	0.016	0.026	0.029
	(0.11)	(0.11)	(0.05)	(0.02)	(0.43)	(0.69)	(0.52)	(0.47)
Litigation	0.168	0.177	0.163	0.155	0.281	0.277	0.281	0.278
	(0.08)	(0.07)	(0.09)	(0.11)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
ImplicitClaims	0.197	0.159	0.118	0.087	0.522	0.516	0.502	0.497
	(0.07)	(0.14)	(0.28)	(0.43)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
AnalystFollowing	0.016	0.017	0.014	0.014	0.027	0.028	0.025	0.024
	(0.07)	(0.05)	(0.12)	(0.13)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
ForecastDispersion	-0.828	-0.816	-0.810	-0.818	-0.496	-0.507	-0.491	-0.490
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Generalised pseudo R^2	2.41%	2.68%	2.86%	2.93%	3.19%	3.28%	3.36%	3.40%
No. of Observations	3,834	3,834	3,834	3,834	15,649	15,649	15,649	15,649

All variables are defined in Appendix A. The two-tailed p-values are presented in parentheses and are computed using heteroskedasticity robust standard errors, clustered by firm. All continuous variables are winzorised at 1% and 99% to mitigate the effect of outliers. For the sake of brevity, we do not report coefficient estimates for year indicators.

consistent with Jiang *et al.*'s (2010) finding that CFO equity incentives are positively associated with meeting or beating analysts' forecasts. In column (2), the coefficient on *CFO_Promo_Incent* (coefficient = 0.167, p < 0.01) is significantly positive. We also observe that the coefficient on *CFO_Promo_Incent* is significantly positive in columns (3) and (4).

In the post-SOX period, the coefficients on both *CFO_Promo_Incent* and *CFO_Equity_Incent* are significantly positive. Taken together, we observe that CFO promotion-based incentives are positively associated with the likelihood of meeting or beating analysts' forecasts in both the pre- and post-SOX periods, suggesting that CFOs have more incentives to avoid negative forecast surprises when they have higher promotion-based incentives.

4.4 Accounting Misconduct

Panel A of Table 4 displays the Pearson correlations for the variables used in the accounting misconduct test. We find that *CFO_Promo_Incent* is positively correlated with *Misconduct,* indicating that CFO promotion-based incentives are positively correlated with the likelihood of accounting manipulations.

Panel B of Table 4 shows the relation between CFO promotion-based incentives and the likelihood of accounting misconduct. In the pre-SOX period, the coefficient on *CFO_Promo_Incent* is significantly positive in columns (2), (3), and (4), indicating that the likelihood of accounting misconduct is higher when CFO promotion-based incentives increase. This finding indicates that promotion-based incentives may induce CFOs to commit accounting frauds. However, *Misconduct* is not related to *CFO_Promo_Incent* in the post-SOX period, suggesting that SOX may have deterred accounting misconduct caused by CFOs' promotion incentives because CEOs and CFOs are now personally responsible for firms' financial reporting frauds in the post-SOX period (Cohen *et al.*, 2008). We also find *CEO_Equity_Incent*, *CFO_Equity_Incent*, and CEO power measures are mostly insignificant in both the pre- and post-SOX periods.

In sum, we find consistent evidence that CFO promotion-based incentives are associated with opportunistic reporting activities in the pre-SOX period, while we only observe a positive association between CFO promotion-based incentives and the likelihood of meeting or beating analysts' forecasts in the post-SOX period. Our findings confirm that SOX successfully mitigates accounting manipulations.

4.5 Real Earnings Management

Panel A of Table 5 presents the Pearson correlations among the variables used for the real earnings management test. *CFO_Promo_Incent* is negatively correlated with *RM_Proxy* and *RM_CFO* but is not correlated with *RM_DiscExp* or *RM_Prod*.

Panel B of Table 5 presents the effect of CFO promotion-based incentives on real earnings management. In both the pre- and post-SOX periods, the coefficient on

Table 4

Panel A   Pearson correlations of main variables for the accounting misconduct test

		Misconduct	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
V1	CFO_Promo_Incent	**0.149**										
V2	CFO_Equity_Incent	0.040	**0.251**									
V3	CEO_Equity_Incent	-0.025	0.060	**0.539**								
V4	CEO_Chair	-0.001	**0.108**	-0.023	**0.127**							
V5	CEO_PaySlice	**0.131**	**0.655**	**0.115**	-0.044	0.049						
V6	VP_CFO_Ratio	-0.033	-0.015	**0.088**	-0.046	-0.008	**0.322**					
V7	ΔCash_Sale	0.063	0.039	**0.329**	**0.286**	-0.020	-0.004	-0.002				
V8	ΔIB	-0.033	0.002	0.042	0.002	**-0.072**	0.045	**0.080**	**0.085**			
V9	ΔInvt	**0.081**	0.054	0.012	0.027	0.002	0.067	-0.001	**0.300**	0.052		
V10	ΔRect	0.053	-0.035	**0.129**	**0.127**	0.016	-0.035	0.006	**0.411**	**0.123**	**0.404**	
V11	Rsst_Accruals	-0.023	-0.014	**0.155**	**0.208**	0.023	-0.007	**0.078**	**0.419**	**0.206**	**0.296**	**0.410**

Correlations significant at the 5% level or less appear in bold. All variables are defined in Appendix A.

Panel B Conditional logistic regression of the likelihood of accounting misconduct on the CFO promotion-based incentives

| | Dependent Variable = *Misconduct* | | | | | | | |
| | pre-SOX | | | | post-SOX | | | |
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.864	-3.001	-3.092	-3.144	-0.776	-1.594	-1.587	-1.209
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(0.04)	(0.04)	(0.16)
CFO_Promo_Incent		0.289	0.311	0.229		0.115	0.113	0.103
		(<0.01)	(<0.01)	(0.02)		(0.26)	(0.28)	(0.49)
CFO_Equity_Incent	0.290		-0.749	-0.659	0.425		0.096	0.542
	(0.68)		(0.37)	(0.51)	(0.68)		(0.93)	(0.62)
CEO_Equity_Incent				0.019				-1.050
				(0.97)				(0.09)
CEO_Chair				0.255				-0.374
				(0.25)				(0.16)
CEO_PaySlice				1.182				0.321
				(0.20)				(0.81)
ΔCash_Sales	0.313	0.276	0.370	0.411	0.052	0.036	0.031	0.006
	(0.27)	(0.35)	(0.24)	(0.19)	(0.93)	(0.95)	(0.96)	(0.99)
ΔEarnings	-1.598	-1.686	-1.741	-1.828	1.212	1.337	1.315	1.169
	(0.11)	(0.11)	(0.10)	(0.10)	(0.40)	(0.36)	(0.37)	(0.42)
ΔInventory	2.838	2.001	1.468	1.462	10.736	10.587	10.588	10.549
	(0.32)	(0.49)	(0.62)	(0.63)	(0.05)	(0.05)	(0.05)	(0.04)
ΔRecievables	2.409	3.145	3.252	3.272	0.580	1.058	1.025	1.729
	(0.29)	(0.19)	(0.18)	(0.18)	(0.87)	(0.76)	(0.77)	(0.64)
Rsst_Accruals	-0.517	-0.386	-0.352	-0.425	-2.476	-2.556	-2.553	-2.377
	(0.41)	(0.53)	(0.56)	(0.49)	(0.02)	(0.01)	(0.01)	(0.03)
Generalised pseudo R2	1.97%	5.68%	5.85%	6.43%	2.77%	3.17%	3.17%	5.10%
No. of Observations	470	470	470	470	330	330	330	330

All variables are defined in Appendix A. The two-tailed p-values are presented in parentheses and are computed using heteroskedasticity robust standard errors, clustered by firm. All continuous variables are winzorised at 1% and 99% to mitigate the effect of outliers.

Table 5

Panel A   Pearson correlations of main variables for the real earnings management test

		RM_Proxy	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V10	V10	V10	V11
V1	RM_CFO	**0.669**														
V2	RM_Prod	**0.849**	**0.317**													
V3	RM_DiscExp	**-0.179**	**-0.400**	**-0.230**												
V4	CFO_Promo_Incent	-0.031	-0.047	-0.009	0.002											
V5	CFO_Equity_Incent	**-0.116**	**-0.102**	**-0.092**	-0.004	**0.207**										
V6	CEO_Equity_Incent	**-0.111**	**-0.099**	**-0.088**	-0.006	**0.124**	**0.508**									
V7	CEO_Chair	0.009	-0.007	0.010	0.026	**0.096**	**0.086**	**0.223**								
V8	CEO_PaySlice	0.009	-0.010	**0.017**	**0.013**	**0.626**	**0.051**	-0.009	**0.060**							
V9	VP_CFO_Ratio	0.012	0.004	**0.014**	0.007	**-0.065**	**0.065**	**-0.083**	**-0.050**	**0.291**						
V10	Size	**0.063**	0.011	**0.079**	0.031	**0.630**	**0.202**	**0.111**	**0.131**	**0.162**	-0.021					
V11	StdCashFlow	**-0.051**	0.000	**-0.060**	**-0.045**	**-0.186**	**-0.064**	**-0.035**	**-0.072**	**-0.070**	**-0.019**	**-0.390**				
V12	StdRev	**0.054**	**0.017**	**0.060**	**0.018**	**-0.119**	**-0.046**	**-0.030**	**-0.034**	**-0.040**	0.004	**-0.220**	**0.403**			
V13	StdSalesGrowth	**-0.029**	**-0.016**	**-0.019**	**-0.032**	**-0.064**	**0.027**	**0.023**	**-0.043**	**-0.031**	-0.010	**-0.154**	**0.384**	**0.254**		
V14	Oldfirm	**0.069**	**0.031**	**0.071**	**0.024**	**0.166**	-0.008	**-0.085**	**0.077**	**0.075**	0.024	**0.331**	**-0.208**	**-0.137**	**-0.199**	
V15	Leverage	**0.112**	**0.080**	**0.101**	**0.030**	**0.203**	**-0.068**	**-0.132**	**0.070**	**0.087**	0.013	**0.376**	**-0.094**	**0.033**	**-0.094**	**0.162**

Correlations significant at the 5% level or less appear in bold. All variables are defined in Appendix A.

Panel B OLS regression of the real earnings management on the CFO promotion-based incentives

	Dependent Variable = *RM_Proxy*							
	pre-SOX				post-SOX			
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.115	-0.104	-0.104	-0.108	-0.084	-0.075	-0.075	-0.074
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
CFO_Promo_Incent		-0.003	-0.003	-0.007		-0.002	-0.002	-0.005
		(<0.01)	(<0.01)	(<0.01)		(0.04)	(0.04)	(<0.01)
CFO_Equity_Incent	-0.006		-0.003	-0.007	-0.023		-0.023	-0.017
	(0.65)		(0.82)	(0.58)	(0.04)		(0.04)	(0.15)
CEO_Equity_Incent				0.009				-0.009
				(0.16)				(0.11)
CEO_Chair				0.003				0.001
				(0.12)				(0.54)
CEO_Payslice				0.049				0.039
				(<0.01)				(<0.01)
Size	0.002	0.004	0.004	0.005	0.002	0.003	0.003	0.005
	(0.04)	(<0.01)	(<0.01)	(<0.01)	(0.02)	(<0.01)	(<0.01)	(<0.01)
StdCashFlow	0.052	0.057	0.057	0.066	-0.043	-0.038	-0.042	-0.039
	(0.13)	(0.09)	(0.09)	(0.05)	(0.23)	(0.29)	(0.25)	(0.28)
StdRev	0.065	0.065	0.065	0.065	0.048	0.048	0.048	0.048
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
StdSalesGrowth	0.006	0.006	0.006	0.007	0.003	0.003	0.003	0.003
	(0.26)	(0.23)	(0.22)	(0.19)	(0.66)	(0.66)	(0.63)	(0.61)
Oldfirm	0.002	0.001	0.001	0.001	0.004	0.003	0.003	0.003
	(0.52)	(0.59)	(0.60)	(0.62)	(0.07)	(0.09)	(0.08)	(0.13)
Leverage	-0.014	-0.013	-0.012	-0.012	-0.025	-0.025	-0.024	-0.024
	(0.07)	(0.09)	(0.10)	(0.11)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
R^2	27%	27.17%	27.17%	27.58%	14.99%	14.99%	15.02%	15.08%
No. of Observations	7,175	7,175	7,175	7,175	18,398	18,398	18,398	18,398

All variables are defined in Appendix A. The two-tailed p-values are presented in parentheses and are computed using heteroskedasticity robust standard errors, clustered by firm. All continuous variables are winzorised at 1% and 99% to mitigate the effect of outliers. For the sake of brevity, we do not report coefficient estimates for market-to-book decile indicators, year indicators, exchange indicators, G index dummies, and the Fama and French (1997) industry indicators.

CFO_Promo_Incent is significantly negative, indicating that CFO promotion-based incentives mitigate real earnings management activities. The results are different from accruals management, which could be caused by the fact that real earnings management is costly in the sense that it negatively affects firms' long-run performance (e.g. Roychowdhury, 2006). If a CFO has the potential to get promoted to the CEO position, she or he should care about the firm's future performance after taking office. Furthermore, unlike accruals management that is determined and undertaken by CFOs (Jiang *et al.*, 2010), real earnings management requires cooperation from other VPs who may be competing with the CFO for the CEO position. The coefficients on *CFO_Equity_Incent* and *CEO_Equity_Incent* are insignificant in columns (4) and (8).

4.6 Cross-sectional Analyses

If VPs, including CFOs, have inside information about potential CEO turnovers and plan ahead accordingly, we expect that CFO promotion-based incentives are higher in the years before CEO turnovers.[22] *CEO_Turnover* is defined as a dummy variable that equals 1 if the test period is within the two-year period prior to CEO turnovers and 0 otherwise.[23] Panel A of Table 6 shows that in the pre-SOX period, the absolute value of discretionary accruals remains positively associated with *CFO_Promo_Incent* (coefficient = 0.005, p < 0.01) but negatively associated with *CEO_Turnover* (coefficient = -0.015, p = 0.08). More importantly, the coefficient on the interaction term *CEO_Turnover × CFO_Promo_Incent* is positive and statistically significant (coefficient = 0.003, p = 0.03), suggesting that the positive association between absolute discretionary accruals and CFO promotion incentives is more pronounced in the two-year period preceding CEO turnovers. However, the coefficient on the interaction term is insignificant in the post-SOX period. In Panel of Table 6, the likelihood of meeting or beating analysts' forecasts remains positively associated with *CFO_Promo_Incent* (coefficient = 0.180, p < 0.01) in the pre-SOX period. The coefficient on the interaction term *CEO_Turnover × CFO_Promo_Incent* is positive and statistically significant (coefficient = 0.149, p = 0.06), suggesting that the positive association between the likelihood of meeting or beating analysts' forecasts and CFO promotion incentives is also more pronounced in the two-year period preceding CEO turnovers. However, in Panel C of Table 6, we fail to find that the interaction term is associated with *Misconduct*. Overall, we find some evidence supporting the notion that the relation between CFO promotion-based incentives and opportunistic financial reporting is stronger when approaching CEO turnovers.

We also examine the impact of the pay gap between the CFO and other VPs

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[22] It is reasonable to assume that CFOs and other VPs have internal information advantages and can foresee CEO turnover. This is because CFOs and other VPs are top managers who work with the Board of Directors regularly and should have inside information to foresee CEO turnover.

[23] We follow Murphy and Zimmerman (1993) and use two years preceding CEO turnover as the cut-off.

(*CFO_VP_ratio*) in Table 6. *CFO_VP_ratio* is calculated as CFO pay divided by the average pay of other VPs. Hence, a higher *CFO_VP_ratio* ratio indicates that the CFO receives higher pay relative to other VPs, which may imply a higher probability of the CFO being promoted to the CEO position when competing with other VPs. We therefore expect that *CFO_VP_ratio* is positively associated with opportunistic financial reporting. We find that *CFO_VP_ratio* is indeed positively associated with the absolute value of discretionary accruals in the post-SOX period (coefficient = 0.003, $p < 0.01$) in Panel A and positively associated with meeting or beating analysts' forecasts in both the pre- and post-SOX periods (coefficient = 0.330, $p < 0.01$ and coefficient = 0.202, $p < 0.01$, respectively) in Panel B. However, we do not find a significant association between *CFO_VP_ratio* and accounting misconduct in Panel C.[24] Overall, we find some evidence that CFOs engage in more opportunistic financial reporting when the pay gap between the CFO and other VPs is greater.

Table 6 Panel D reports the results for real earnings management. We do not find a significant association between the interaction term *CEO_Turnover × CFO_Promo_Incent* and *RM_Proxy*. In addition, we do not find a significant association between *CFO_VP_ratio* and real earnings management.

Table 6
Panel A   OLS regression of the absolute value of discretionary accruals on the CFO promotion-based incentives conditional on CEO turnover

| | Dependent Variable = \|*Discretionary Accruals*\| | | | |
| | pre-SOX | | post-SOX | |
Variables	(1)	(2)	(3)	(4)
Intercept	0.021	0.018	0.053	0.051
	(0.16)	(0.24)	(<0.01)	(<0.01)
CFO_Promo_Incent	0.005	0.006	0.001	0.002
	(<0.01)	(<0.01)	(0.03)	(<0.01)
CEO_Turnover	-0.015		0.008	
	(0.08)		(0.16)	
CEO_Turnover× CFO_Promo_Incent	0.003		-0.001	
	(0.03)		(0.12)	
CFO_VP_ratio		0.003		0.003
		(0.17)		(<0.01)
CEO_Chair	0.003	0.003	0.001	0.001
	(0.06)	(0.05)	(0.16)	(0.18)
CEO_Payslice	-0.024	-0.036	-0.009	-0.022
	(<0.01)	(<0.01)	(0.06)	(<0.01)
Size	-0.006	-0.006	-0.004	-0.004
	(<0.01)	(<0.01)	(<0.01)	(<0.01)

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[24] We also examine whether firms' internal promotion history affects the association between the CEO-CFO pay gap and opportunistic reporting behaviour. We predict that CFOs in firms with incumbent CEOs who are hired within the firm may have higher promotion-based incentives to manage earnings. However, the untabulated result does not support our prediction.

	(1)	(2)	(3)	(4)
StdCashFlow	0.163	0.169	0.182	0.186
	(<0.01)	(<0.01)	(<0.01)	(<0.01)
StdRev	0.049	0.048	0.030	0.030
	(<0.01)	(<0.01)	(<0.01)	(<0.01)
StdSalesGrowth	0.005	0.004	0.004	0.004
	(0.11)	(0.19)	(0.10)	(0.09)
Oldfirm	-0.003	-0.003	-0.001	-0.001
	(0.10)	(0.08)	(0.46)	(0.46)
Leverage	0.025	0.024	0.009	0.008
	(<0.01)	(<0.01)	(<0.01)	(<0.01)
R^2	18.12%	18.04%	12.54%	12.65%
No. of Observations	8,266	7,811	20,210	19.021

All variables are defined in Appendix A. The two-tailed p-values are presented in parentheses and are computed using heteroskedasticity robust standard errors, clustered by firm. All continuous variables are winzorised at 1% and 99% to mitigate the effect of outliers. For the sake of brevity, we do not report coefficient estimates for market-to-book decile indicators, year indicators, exchange indicators, G index dummies, and the Fama and French (1997) industry indicators.

Panel B   Logistic analysis of the likelihood of meeting or beating analysts' forecasts on the CFO promotion-based incentives conditional on CEO turnover

	Dependent Variable = *Positive Surprise*			
	pre-SOX		post-SOX	
Variables	(1)	(2)	(3)	(4)
Intercept	0.127	-0.590	-0.343	-0.726
	(0.72)	(0.11)	(0.11)	(<0.01)
CFO_Promo_Incent	0.180	0.297	0.139	0.217
	(<0.01)	(<0.01)	(<0.01)	(<0.01)
CEO_Turnover	-1.376		-0.242	
	(0.01)		(0.49)	
CEO_Turnover× CFO_Promo_Incent	0.149		0.013	
	(0.06)		(0.76)	
CFO_VP_ratio		0.330		0.202
		(<0.01)		(<0.01)
CEO_Chair	0.051	0.043	0.089	0.074
	(0.53)	(0.61)	(0.05)	(0.11)
CEO_Payslice	-0.720	-1.430	-0.320	-1.109
	(0.14)	(0.02)	(0.29)	(<0.01)
Size	0.024	-0.009	-0.061	-0.075
	(0.64)	(0.86)	(0.05)	(0.02)
Growth	-0.142	-0.098	-0.057	-0.051
	(0.17)	(0.36)	(0.39)	(0.46)
SalesGrowth	0.028	0.031	0.037	0.057
	(0.21)	(0.17)	(0.11)	(0.06)
NOA	-0.043	-0.067	-0.058	-0.068
	(0.43)	(0.23)	(0.10)	(0.06)
Shares	-0.122	-0.112	0.020	0.014
	(0.09)	(0.14)	(0.61)	(0.74)
Litigation	0.195	0.220	0.281	0.269
	(0.04)	(0.03)	(<0.01)	(<0.01)

ImplicitClaims	0.139	0.074	0.515	0.512
	(0.20)	(0.51)	(<0.01)	(<0.01)
AnalystFollowing	0.016	0.016	0.027	0.026
	(0.07)	(0.09)	(<0.01)	(<0.01)
ForecastDispersion	-0.815	-0.986	-0.506	-0.636
	(0.01)	(<0.01)	(0.02)	(<0.01)
Generalised pseudo R^2	3.21%	3.16%	3.37%	3.55%
No. of Observations	3,834	3,684	15,649	14,792

All variables are defined in Appendix A. The two-tailed p-values are presented in parentheses and are computed using heteroskedasticity robust standard errors, clustered by firm. All continuous variables are winzorised at 1% and 99% to mitigate the effect of outliers. For the sake of brevity, we do not report coefficient estimates for year indicators.

Panel C   Logistic regression of the likelihood of accounting misconduct on the CFO promotion-based incentives conditional on CEO turnover

	Dependent Variable = *Misconduct*			
	pre-SOX		post-SOX	
Variables	(1)	(2)	(3)	(4)
Intercept	-2.876	-2.640	-1.053	-1.534
	(<0.01)	(<0.01)	(0.25)	(0.13)
CFO_Promo_Incent	0.110	0.150	0.012	0.111
	(0.29)	(0.13)	(0.94)	(0.51)
CEO_Turnover	-0.473		-1.248	
	(0.70)		(0.49)	
CEO_Turnover× CFO_Promo_Incent	0.164		0.281	
	(0.30)		(0.23)	
CFO_VP_ratio		-0.366		0.011
		(0.07)		(0.97)
CEO_Chair	0.267	0.261	-0.529	-0.467
	(0.24)	(0.24)	(0.05)	(0.08)
CEO_PaySlice	2.073	2.202	0.837	0.593
	(0.03)	(0.04)	(0.54)	(0.70)
ΔCash_Sales	0.365	0.318	0.063	-0.124
	(0.20)	(0.30)	(0.92)	(0.85)
ΔEarnings	-1.461	-1.125	0.807	0.998
	(0.19)	(0.32)	(0.57)	(0.49)
ΔInventory	2.097	2.560	10.793	9.582
	(0.48)	(0.40)	(0.04)	(0.08)
ΔRecievables	3.401	2.528	1.582	1.310
	(0.16)	(0.29)	(0.66)	(0.72)
Rsst_Accruals	-0.482	-0.278	-2.366	-2.405
	(0.44)	(0.66)	(0.03)	(0.03)
Generalised pseudo R2	8.45%	6.85%	7.29%	4.18%
No. of Observations	470	446	330	307

All variables are defined in Appendix A. The two-tailed p-values are presented in parentheses and are computed using heteroskedasticity robust standard errors, clustered by firm. All continuous variables are winzorised at 1% and 99% to mitigate the effect of outliers.

Panel D   OLS regression of the real earnings management on the CFO promotion-based incentives conditional on CEO turnover

Variables	Dependent Variable = *RM_Proxy*			
	pre-SOX		post-SOX	
	(1)	(2)	(3)	(4)
Intercept	-0.101	-0.108	-0.076	-0.068
	(<0.01)	(<0.01)	(<0.01)	(<0.01)
CFO_Promo_Incent	-0.007	-0.008	-0.005	-0.007
	(<0.01)	(<0.01)	(<0.01)	(<0.01)
CEO_Turnover	-0.017		0.002	
	(0.15)		(0.91)	
CEO_Turnover× CFO_Promo_Incent	0.002		-0.000	
	(0.18)		(0.92)	
CFO_VP_ratio		-0.002		-0.004
		(0.25)		(0.10)
CEO_Chair	0.004	0.005	0.000	0.001
	(0.06)	(0.04)	(0.94)	(0.74)
CEO_Payslice	0.049	0.057	0.038	0.054
	(<0.01)	(<0.01)	(<0.01)	(<0.01)
Size	0.005	0.005	0.004	0.004
	(<0.01)	(<0.01)	(<0.01)	(<0.01)
StdCashFlow	0.065	0.058	-0.035	-0.046
	(0.05)	(0.09)	(0.33)	(0.22)
StdRev	0.065	0.066	0.048	0.049
	(<0.01)	(<0.01)	(<0.01)	(<0.01)
StdSalesGrowth	0.007	0.006	0.003	0.002
	(0.16)	(0.25)	(0.65)	(0.73)
Oldfirm	0.001	0.001	0.003	0.003
	(0.71)	(0.59)	(0.11)	(0.12)
Leverage	-0.012	-0.011	-0.025	-0.025
	(0.10)	(0.16)	(<0.01)	(<0.01)
R^2	27.57%	27.41%	15.04%	15.14%
No. of Observations	7,175	6,788	18,398	17,328

All variables are defined in Appendix A. The two-tailed p-values are presented in parentheses and are computed using heteroskedasticity robust standard errors, clustered by firm. All continuous variables are winzorised at 1% and 99% to mitigate the effect of outliers. For the sake of brevity, we do not report coefficient estimates for market-to-book decile indicators, year indicators, exchange indicators, G index dummies, and the Fama and French (1997) industry indicators.

V. Conclusions

This study examines whether CFO promotion-based incentives, measured by the pay gap between the CEO and the CFO, affect managerial opportunistic reporting activities. Using data for the period 1993 to 2018, we provide evidence that CFO promotion-based incentives are positively associated with accruals management and accounting misconduct in the pre-SOX period. We also find that CFO promotion-based incentives are positively

associated with the likelihood of meeting or beating analysts' forecasts in both the pre- and post-SOX periods. In addition, we document that CFO promotion-based incentives are negatively associated with real earnings management in both the pre- and post-SOX periods. Our results are robust after controlling for CFO and CEO equity incentives and CEO power. Our results suggest that CFO promotion-based incentives may encourage CFOs to engage in more aggressive financial reporting activities but mitigate real earnings management. Moreover, we find some evidence that the association between CFO promotion-based incentives and opportunistic reporting activities is more profound before CEO turnovers. Our results also provide some support for the notion that CFOs engage in more opportunistic financial reporting when the pay gap between the CFO and other VPs is greater. The findings of this study should be of interest to boards of directors, regulators, and academics.

Our study is not without caveats. We are unable to determine whether corporate boards will attribute the inflated firm performance solely to CFOs. Hence, earnings management driven by CFO promotion-based incentives may help CEOs secure their positions. We argue that this concern may not discourage CFOs from managing earnings in order to outperform other VPs because the boards of directors are likely to consider successors to the CEO on the basis of various criteria and relative performance benchmarks (e.g. Lazear, 1989; Gibbs, 1995). Future research can further examine how VPs, including the CFO, impress corporate boards with their abilities and help the boards to differentiate their performance from that of the CEO.

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Appendix A – Variable Definitions

Variable Name	Description
CFO_Promo_Incent	The logarithm of the total pay gap between the CEO and the CFO
CFO_Equity_Incent	CFO's equity incentive ratio as per Bergstresser and Philippon (2006)
CEO_Equity_Incent	CEO's equity incentive ratio as per Bergstresser and Philippon (2006)
CEO_Payslice	CEO pay divided by the sum of the pay of top five senior executives
CEO_Chair	A dummy variable that equals 1 if the CEO is also Chairman of the Board and 0 otherwise
|Discretionary Accruals|	The absolute value of abnormal accruals estimated by using the modified Jones model
Size	The natural logarithm of lagged total assets
OldFirm	A dummy variable that equals 1 if a firm is included in Compustat for more than 20 years and 0 otherwise
StdSalesGrowth	The standard deviation of sales growth over the current and previous four years
Leverage	Total liabilities deflated by total assets
StdRev	The standard deviation of sales deflated by total assets over the current and previous four years
StdCashFlow	The standard deviation of sales growth over the current and previous four years
MarketToBookDecile	The indicators of market value to book value deciles, which are calculated as deciles of the market value of assets divided by the book value of assets, ranked within each year
Positive surprise	A dummy variable that equals 1 if a firm's actual earnings per share is greater or equal to the latest analyst consensus forecast and 0 otherwise
Growth	The book value of equity to market value of equity at the beginning of year t
SalesGrowth	The sales in year t divided by sales in year t-1
NOA	The net operating assets deflated by sales measured at the beginning of year t
Shares	The natural logarithm of common shares outstanding measured at the end of year t
Litigation	A dummy variable that equals 1 if the firm is in the pharmaceutical, biotechnology, computer, electronics, or retail industries and 0 otherwise

ImplicitClaims	1 minus the ratio of gross PPE to total assets measured at the end of year t
AnalystFollowing	The number of analysts whose forecasts are included in the I/B/E/S consensus annual earnings forecast
ForecastDispersion	The coefficient of variation of the consensus forecast (standard deviation divided by the mean of analysts' forecasts)
Year	The year indicators
G_Index	Governance index as per Gompers *et al.* (2003): G1 equals 1 if G < = 6, and 0 otherwise; G2 equals 1 if 7 < = G < = 9, and 0 otherwise; G3 equals 1 if 10 < = G < = 12, and 0 otherwise; G4 equals 1 if G > = 13, and 0 otherwise
Exchange	The exchange indicators
Industry	The Fama and French industry indicators
Misconduct	A dummy variable that equals 1 if the firm is charged by the SEC for accounting manipulations and 0 otherwise
ΔCash_Sales	The rate of change in cash sales, where cash sales are sales minus change in Accounts Receivable
ΔEarnings	The annual change in Net Income divided by average total Assets
ΔInventory	The annual change in Inventory divided by average total Assets
ΔRecievables	The annual change in Accounts Receivable divided by average total Assets
Rsst_Accruals	($ΔWC + ΔNCO + ΔFIN$)/Average total assets, where *WC*=[Current Assets – Cash and Short-term Investments] – [Current Liabilities – Debt in Current Liabilities]; *NCO*=[Total Assets – Current Assets − Investments and Advances] – [Total Liabilities – Current Liabilities – Long-term Debt]; *FIN*=[Short-term Investments + Long-term Investments] – [Long-term Debt + Debt in Current Liabilities + Preferred Stock]
RM_Proxy	The standardised sum of the three real earnings management proxies (*RM_CFO*, *RM_Prod*, and *RM_DiscExp*)
CEO_Turnover	A dummy variable that equals 1 if the test periods falls within the last two years approaching CEO turnovers and 0 otherwise
CFO_VP_Ratio	CFO pay divided by average VP pay