CFO Gender and Accruals Quality

Abhijit Barua, Lewis F. Davidson, Dasaratha V. Rama, and Sheela Thiruvadi

SYNOPSIS: The authors examine the association between chief financial officer (hereafter, CFO) gender and the quality of accruals. Based on findings in prior research on gender differences in a variety of decision settings—risk-taking attitudes, financial judgments, and regulatory compliances—they hypothesize that firms with female CFOs will have higher quality of accruals. The empirical findings, based on a sample of 1,559 (1,222) firms in 2005 (2004), support this hypothesis. The study shows that companies with female CFOs have lower performance-matched absolute discretionary accruals and lower absolute accrual estimation errors, after controlling for other factors that prior research has shown to be associated with accruals.

INTRODUCTION

The objective of this paper is to examine the association between CFO gender and the quality of accruals. Motivation for this study comes from (1) recent congressional actions related to the role of individual executives in ensuring financial reporting quality, and (2) research from diverse areas suggesting gender differences in business and accounting judgments. We test our hypotheses using a sample of 1,559 (1,222) firms from 2005 (2004).

In the aftermath of the Enron failure, legislators and regulators have shown increasing interest in the role of the CFO in ensuring financial reporting quality. This interest likely occurs because the CFO has a substantial amount of control over a firm's reported financial results (Geiger and North 2006).[1] Sections 302, 404, and 906 of the Sarbanes-Oxley Act of 2002, or SOX (U.S. House of Representatives, Committee on Financial Services 2002) require that the chief executive officer (hereafter, CEO) and the chief financial officer (hereafter, CFO) of SEC-listed firms personally certify various aspects of the financial statements filed with the SEC.

Some recent studies have examined the association between CFO appointments and accruals quality. Dowdell and Krishnan (2004) compare discretionary accruals for 172 companies that appointed to the CFO position someone who was a former employee of the company's audit firm and a control sample of companies that appointed new CFOs who were not affiliated with their

---

Abhijit Barua is an Assistant Professor at Florida International University, Lewis F. Davidson and Dasaratha V. Rama are both Professors at Florida International University, and Sheela Thiruvadi is an Assistant Professor at Morgan State University.

---

[1] About 80 percent of financial statement fraud involves the company's CFO or CEO (Beasley et al. 1999).

auditors. They find that firms with affiliated CFOs have greater earnings management than firms with unaffiliated CFOs. Geiger and North (2006) examine changes in discretionary accruals surrounding the appointment of a new CFO for 712 companies that appointed new CFOs from 1994 to 2000; they show a significant reduction in discretionary accruals following the appointment of a new CFO, and that the reduction is greater than for a control group of firms without new CFOs. Geiger et al. (2008) find that market reactions to companies hiring accounting and finance officers directly from their external audit firms during 1985–2002 is significantly positive, and that such appointments are not associated with lower financial reporting quality, when such quality is measured using discretionary accruals or an Accounting and Auditing Enforcement Release (AAER) against the company. Thus, recent research has examined the association between CFO tenure and the quality of accruals. In this paper, we examine another CFO characteristic—gender—and the quality of accruals.

As discussed in detail later, research from diverse areas suggests that women tend to be less aggressive or more cautious in a variety of financial decisions. For example, women tend to be more averse to risk in general (Byrnes et al. 1999) and in the context of investment choices (Riley and Chow 1992); women are more likely to choose less aggressive options for retirement (Sunden and Surette 1998) and in common stock portfolios (Barber and Odean 2001); women are more likely to be in compliance with rules and regulations; and gender differences are particularly pronounced in ambiguous situations—as is the case in the context of accruals (Baldry 1987; Lenney 1977). Huang and Kisgen (2008) find evidence suggesting that female CFOs are more cautious in evaluating acquisitions and in issuing debt. The overall weight of such evidence showing differential caution and risk-taking by women in business and finance leads to our hypothesis that firms with female CFOs would likely have higher accruals quality.

We test our hypothesis using two different approaches. First, we use the absolute value of performance-matched abnormal total accruals and abnormal current accruals following the method suggested in Kothari et al. (2005). Second, we use cross-sectional versions of the Dechow and Dichev (2002) (hereafter, DD 2002) measure of accruals quality and its extended version as implemented in Francis et al. (2005) and Jones et al. (2008). We test our hypothesis using a sample of 1,559 (1,222) firms with fiscal year-ends in 2005 (2004). Our results show that companies with female CFOs have lower absolute abnormal accruals and lower accrual estimation errors.

The next section provides the background and develops the hypothesis. This section is followed by a discussion of method and data. After providing details about the results from our analyses, we conclude with a summary and discussion.

BACKGROUND AND HYPOTHESIS
Gender Differences in Decision Making

Byrnes et al. (1999) review 150 studies related to gender differences in risk taking and find significant support for the proposition that women, on average, are more cautious and less aggressive than men in a variety of decision contexts. Prior research also shows that such caution and aversion to extreme outcomes by women is prevalent in a variety of business judgment and decision contexts. For example, Sexton and Bowman-Upton (1990) examine entrepreneurs and find lower scores among females for four types of risk-taking measures; Hansemark (2003) shows that there are significant differences between male and female entrepreneurs in the prerequisites for starting new businesses. Powell and Ansic (1997) find that females are more cautious and less risk-seeking than males irrespective of familiarity, costs, or ambiguity, and that men and women adopt different strategies in financial-decision environments.

Many studies have examined whether such gender differences in caution and aversion to risk found in the general psychology and business literatures translate into differences in financial judgment and decision settings. Cohn et al. (1975) and Riley and Chow (1992) find that women are more risk averse than men when making investment choices. Other research shows that after controlling for demographic factors such as income, age, and marital status, women are more likely to choose more cautious options for retirement (Hinz et al. 1997; Bajtelsmit and VanDerhei 1997; Sunden and Surette 1998; Watson and McNaughton 2007) and common stock portfolios (Barber and Odean 2001). Olsen and Cox (2001) find that women (1) weigh attributes, such as ambiguity, more heavily than their male colleagues, and (2) emphasize risk reduction more than men do in financial decisions. Studies also suggest that women are likely to exhibit lower confidence in male-dominated areas such as finance, and are less prone to overconfidence in financial judgments (Barber and Odean 2001; Fehr-Duda et al. 2006). Estes and Hosseini (1988) find that even among expert investors, gender is a significant explanatory factor affecting confidence in investment decisions after controlling for age, experience, education, knowledge, and asset holdings.

Prior research also provides support for gender differences in compliance with regulations in accounting and tax-related situations. In an experimental setting, Baldry (1987) shows that females are likely to be more compliant in tax-reporting decisions than males, while Fallan (1999) finds that gender is significant in explaining attitude changes in tax ethics. Cullis et al. (2006) find that men are likely to report significantly less income than women when the tax amount is framed as a loss. Lenney (1977) suggests that such gender differences are particularly prevalent in ambiguous situations—as is the case with judgments related to accruals.

In a contemporaneous study, Huang and Kisgen (2008) find that female CFOs are more cautious in their acquisition and debt-issuance decisions. The authors find that companies with female CFOs make fewer acquisitions, but acquisitions by firms with female CFOs have higher announcement returns. Furthermore, Huang and Kisgen (2008) also find that firms with female CFOs issue debt less frequently than do firms with male CFOs. Overall, the authors suggest that the results indicate greater caution in deal-making by female CFOs.

In summary, prior research suggests that females are more cautious and more likely to be compliant with accounting regulations. This leads to the argument that female CFOs are less likely to be aggressive in making judgments related to discretionary accruals. This argument suggests that firms with female CFOs would be more likely to have higher accruals quality. This leads to our hypothesis.

Formally stated, our hypothesis is:

H0: Firms that have female CFOs will have higher accruals quality than firms with male CFOs.

DATA AND METHOD

Data

We start with 2,938 U.S. firms with CFO profile data from the 2006 version of the Corporate Library database. We use the CFO profile data to obtain information about CFO gender.[2] Table 1 presents the sample selection process. Because prior studies show that CFO turnover and the

---

[2] Neither the later nor earlier versions of the Corporate Library database have information about the profile of the CFO; the earlier versions (starting from 2001) have information only about the name of the CFO (some of the later years have age and tenure data for some, but not all, CFOs). We use the CFO profile data to obtain information about gender, education, experience, and tenure.

TABLE 1

Sample Selection

	Number of Observations		
	2004 and 2005	**2004**	**2005**
U.S. firms in 2006 version of Corporate Library database			2,938
Firms with new CFO in 2005 or CFO tenure data missing			(339)
Firms with a new CFO in 2004		(580)	2,599
	4,618	2,019	2,599
Observations not in Compustat	(54)	(22)	(32)
Firms in financial industries (SIC 6000−6799)	(758)	(326)	(430)
Missing data to estimate abnormal accruals	(174)	(74)	(100)
Missing control variables for regression analyses	(853)	(375)	(478)
Observations used in performance-matched abnormal accruals-based analyses	2,781	1,222	1,559
Missing accrual estimation error variables	(159)	(48)	(111)
Total observations used in accrual estimation error-based analyses	2,622	1,174	1,448

appointment of new CFOs are associated with abnormal accruals, we delete firms with new CFO appointments in 2005 and 2004 for the analyses of accruals quality in 2005 and 2004, respectively. After deleting observations that do not have CFO tenure data or new CFO appointments, we form our initial sample of 2,599 (2,019) firms for fiscal year 2005 (2004). We also delete observations not found in the Compustat database. Given the unique characteristics of financial firms, we delete firms in SIC codes 60 through 67. After deleting firms without required data for estimating performance-matched abnormal accruals and control variables, we have a sample of 2,781 firm-year observations (1,559 and 1,222 for 2005 and 2004, respectively) for our performance-matched accrual analyses.

We also use the DD (2002) model, as implemented in Jones et al. (2008), to evaluate accruals quality. We need values of operating cash flows (*OCF*) in the preceding and succeeding years to estimate the DD accruals quality model. As shown in Table 1, the above steps reduce our sample size to 2,622 firm-year observations (1,448 and 1,174 for 2005 and 2004, respectively) for the DD accruals quality analysis. We get data for accounting variables from the Compustat annual database.

Accruals Measures

Performance Matched Abnormal Accruals

Our first metric is the absolute value of abnormal accruals estimated by using the Modified Jones Model (Dechow et al. 1995) as applied in Kothari et al. (2005). We estimate the following equation cross-sectionally by each two-digit SIC industry and by year:

$$TA_{it} = \varphi_0 + \varphi_1(1/A_{it-1}) + \varphi_2(\Delta REV_{it} - \Delta REC_{it}) + \varphi_3 PPE_{it} + \varepsilon_{it} \tag{1}$$

where:

TA = total accruals for firm i for year t, measured as the difference between income before extraordinary items (Compustat data item #123) and operating cash flows (Compustat data item #308−#124);

A_{it-1} = total assets (Compustat data item #6) of firm i for year $t-1$;

ΔREV_{it} = change in revenues (Compustat data item #12) for firm i from year $t-1$ to year t;

ΔREC_{it} = change in receivables (Compustat data item #2) for firm i from year $t-1$ to year t;

PPE_{it} = firm i's year t gross property plant and equipments (Compustat data item #7); and

ε_{it} = error term.

We estimate Equation (1) by industry-year with at least 10 observations using all observations with required data in Compustat.[3] The residuals from Equation (1) are a measure of abnormal total accruals (*ATA*).

We then adjust ATA_{it} for performance matching following the approach used in Francis et al. (2005). We form performance decile groups by industry based on the current year's *ROA* (where *ROA* is defined as net income before extraordinary items divided by beginning of year total assets). Performance-matched abnormal total accruals ($PMATA_{it}$) are estimated as the difference between ATA_{it} and median *ATA* for the *ROA* decile to which firm i belongs (where the median is calculated excluding firm i). Large values of *PMATA* in both directions reflect lower accruals quality; we use the absolute value of performance-matched total accruals (ABS_PMATA_{it}) as our first measure of accruals quality.

Some prior studies (e.g., Guenther 1994; Teoh et al. 1998; Bradshaw et al. 2001; Ashbaugh et al. 2003) argue that firms have more flexibility in manipulating earnings with current accruals compared with long-term accruals. Hence, we also use a measure of abnormal current accruals. We follow the same approach as used in estimating abnormal total accruals. We derive the following model after deleting PPE_{it} from Equation (1) and estimate by two-digit SIC industry and by year:

$$TCA_{it} = \varphi_0 + \varphi_1(1/A_{it-1}) + \varphi_2(\Delta REV_{it} - \Delta REC_{it}) + \varepsilon_{it} \qquad (2)$$

where:

TCA_{it} = firm i's total current accruals in year $t = (\Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STDEBT_{it})$;[4]

ΔCA_{it} = change in current assets (Compustat data item #4) for firm i from year $t-1$ to year t;

ΔCL_{it} = change in current liabilities (Compustat data item #5) for firm i from year $t-1$ to year t;

$\Delta Cash_{it}$ = change in cash and short-term investment (Compustat data item #1) for firm i from year $t-1$ to year t; and

$\Delta STDEBT_{it}$ = change in current portion of long-term liabilities (Compustat data item #34) for firm i from year $t-1$ to year t.

All other variables are as described in Equation (1). The residuals from the industry and year-specific regressions using Equation (2) are a measure of abnormal current accruals (*ACA*).

Performance-matched abnormal current accruals ($PMACA_i$) are derived after adjusting ACA_i by median *ACA* for the industry *ROA* decile group as described before. We use the absolute value of performance-matched current accruals (ABS_PMACA_{it}) as our second measure of accruals quality.

---

[3] The mean and median values of the coefficients in our accrual estimation regressions are similar to those reported in prior studies (e.g., Subramanyam 1996).

[4] We also use $TCA_{it} = (\text{Total accruals}_{it} + \text{Depreciation and amortization}_{it}) / A_{it-1}$, where total accruals is the difference between income from continuing operations and operating cash flows. Results are quite similar with this alternative measurement for total current accruals.

Accrual Estimation Errors

Our second set of accruals-quality measures is based on accrual estimation errors from the DD (2002) model estimated cross-sectionally as in prior studies (Francis et al. 2008; Jones et al. 2008). We use the following model:

$$TCA_{it} = \phi_0 + \phi_1 OCF_{it-1} + \phi_2 OCF_{it} + \phi_3 OCF_{it+1} + \nu_{it} \tag{3}$$

where OCF_{it} = Operating Cash flow of firm i in year t, and other variables are as defined earlier. All variables are scaled by average total assets. Following Jones et al. (2008), we estimate Equation (3) cross-sectionally by year and by two-digit SIC industry using all observations available in Compustat with required data.[5] The absolute value of residuals from Equation (3) is our third measure of accrual quality (*ABS_DD*).

We then use the augmented specification of the DD (2002) model as suggested by McNichols (2002) and as implemented in prior research (Francis et al. 2005; Jones et al. 2008) as shown below.

$$TCA_{i,t} = \phi_0 + \phi_1 OCF_{i,t-1} + \phi_2 OCF_{i,t} + \phi_3 OCF_{i,t+1} + \phi_4 \Delta REV_{i,t} + \phi_5 PPE_{i,,t} + \nu_{i,,t}. \tag{4}$$

All variables are the same as defined in previous equations. Following Jones et al. (2008), we estimate Equation (4) cross-sectionally by year and by two-digit SIC industry using all observations available in Compustat with required data. The absolute value of residuals from Equation (4) is our fourth measure of accruals quality (*ABS_MDD*).

Regression Model

We conduct regression analyses to test our hypothesis that firms with female CFOs will have higher quality accruals. We test whether female CFOs are less aggressive in using accruals (negative or positive). We use four different proxies for accruals quality (*AQ*) discussed above, and we model *AQ* as a function of different variables representing firm characteristics and an indicator variable for CFO gender in the following cross-sectional regression equation:

$$AQ_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 BM_{it} + \alpha_3 SGROWTH_{it} + \alpha_4 ROA_{it} + \alpha_5 OCF_{it} + \alpha_6 OCF_{it}^2 + \alpha_7 AU_{it}$$

$$+ \alpha_8 DE_{it} + \alpha_9 OPCYCLE_{it} + \alpha_{10} FEMALECFO_{it} + \varepsilon_{it}. \tag{5}$$

The variables are defined as below:

AQ_{it} = accruals quality measures (ABS_PMATA_{it}, ABS_PMACA_{it}, ABS_DD_{it}, ABS_MDD_{it}) estimated as described earlier;

$SIZE_{it}$ = natural logarithm of total assets for firm i in year t;

BM_{it} = ratio of book value of equity to market value;

$SGROWTH_{it}$ = change in revenue for firm i from year $t-1$ to year t divided by revenue in year $t-1$;

ROA_{it} = return on assets measured as earnings before extraordinary items for firm i in year t divided by average total assets in year t;

OCF_{it} = operating cash flow for firm i for year t divided by total assets for year $t-1$;

AU_{it} = 1 if firm i for year t is audited by one of the Big 4 auditors and 0 otherwise;

DE_{it} = book value of debt for firm i for year t divided by book value of equity in year t;

---

[5] The mean and median values of the coefficients in our accrual estimation error regressions are similar to those reported in prior research (e.g., Dechow and Dichev 2002).

$OPCYCLE_{it}$ = natural logarithm of the length of operating cycle measured as the sum of average days of account receivable and average days of inventory; and

$FEMALECFO_{it}$ = 1 if firm i's CFO in year t is female and 0 otherwise.

The variable of interest is *FEMALECFO*. We predict that the coefficient of *FEMALECFO* will be negative in the above *AQ* model because the dependent variables are all inverse measures of accruals quality.

Firm size has been used as a proxy for a variety of constructs in accounting research. Prior studies also suggest that the management in larger firms face more pressure to report more predictable earnings (Pincus and Rajgopal 2002), which may cause managers to use either income-increasing or income-decreasing abnormal accruals. DD (2002) find smaller firms are associated with lower quality of accruals. We also predict a negative coefficient for $SIZE_{it}$.

Prior research suggests that abnormal accruals are associated with variables proxying for growth. We use two different measures for growth that have been used in prior research (e.g., Klein 2002; Menon and Williams 2004; Bédard et al. 2004): book-to-market ratio (*BM*), which is related to market expectations of growth prospects, and recent sales growth (*SGROWTH*).[6] Menon and Williams (2004) find that the absolute value of abnormal accruals is positively associated with sales growth and negatively associated with book-to-market ratio.

Prior studies (e.g., Dechow et al. 1995; Kasznik 1999) show that Jones-type abnormal accrual measures are sensitive to firm performance. We control for firm performance within the industry while estimating performance-matched abnormal accruals. In multivariate analyses, we estimate Equation (3) cross-sectionally across all industries and include a performance variable (*ROA*). DD (2002) find that poor performance is associated with lower quality of earnings, so we predict a negative coefficient for *ROA*. Another performance variable is operating cash flow (*OCF*). Subramanyam (1996) finds a negative and significant relationship between operating cash flows and abnormal accruals. To control for the effect of operating cash flows on abnormal accruals, we include *OCF* but do not predict a sign for *OCF* as we use absolute values as the dependent variable. Because accruals and *OCF* are negatively related, and because our dependent variables are absolute accrual measures, the association between *AQ* measures and *OCF* is likely to be U-shaped, so we also include a quadratic variable, OCF^2, and predict a positive coefficient.

Becker et al. (1998) show that firms audited by Big N audit firms have lower income-decreasing abnormal accruals compared with firms audited by other auditors. *AU* is included in the model to control for auditor type, and we expect Big N auditors are associated with higher quality of earnings. DeFond and Jiambalvo (1994) provide evidence that managers close to violating debt covenants resort to income-increasing abnormal accruals. Sweeney (1994) shows that firms manage earnings upward even after the violation of debt covenants. Thus, firms with debt constraints have incentives to manage earnings upward to meet debt covenants. We include *DE* to control for debt constraints. DD (2002) document that the quality of accruals is negatively related with the length of the operating cycle. We include *OPCYCLE*, the natural logarithm of the length of operating cycle measured as the sum of average days of account receivable and average days of inventory. We predict a positive coefficient for *OPCYCLE*.

RESULTS

Descriptive Statistics

Table 2 presents descriptive statistics of our accruals quality measures and control variables, by partitioning the sample based on CFO gender. Firms with female CFOs constitute 8.0 percent

---

[6] Apart from other differences, *BM* is thus related to expectations about *future* events while *SGROWTH* is a measure of *past* events.

TABLE 2

Descriptive Statistics

Variables	Female CFO 2004: n = 98 2005: n = 135				Male CFO 2004: n = 1124 2005: n = 1424				Test of Difference between Mean (Median)
	Mean	**Q1**	**Median**	**Q3**	**Mean**	**Q1**	**Median**	**Q3**	**p-values**
ABS_PMATA	0.053	0.017	0.035	0.062	0.059	0.015	0.038	0.074	0.078 (0.037)
ABS_PMACA	0.048	0.012	0.029	0.060	0.054	0.014	0.032	0.067	0.056 (0.107)
ABS_DD	0.036	0.012	0.028	0.052	0.046	0.015	0.033	0.059	<0.001 (0.018)
ABS_MDD	0.038	0.010	0.029	0.051	0.045	0.014	0.032	0.059	0.013 (0.129)
SIZE	6.987	5.719	6.982	7.837	7.013	5.853	6.874	8.033	0.818 (0.581)
BM	0.373	0.2190	0.360	0.519	0.419	0.244	0.384	0.566	0.023 (0.408)
SGROWTH	0.216	0.043	0.126	0.233	0.184	0.041	0.112	0.246	0.162 (0.073)
ROA	0.042	0.035	0.069	0.107	0.041	0.018	0.054	0.097	0.516 (0.013)
OCF	0.109	0.065	0.115	0.188	0.100	0.046	0.101	0.157	0.295 (0.054)
AU	0.970	1.000	1.000	1.000	0.923	1.000	1.000	1.000	0.009 (0.009)
DE	0.580	0.001	0.271	0.731	0.686	0.027	0.354	0.865	0.434 (0.168)
OPCYCLE	4.590	4.249	4.661	5.106	4.629	4.277	4.706	5.028	0.411 (0.581)

Variable Definitions:
  ABS_PMATA = absolute value of performance-matched abnormal total accruals measure estimated by using a cross-sectional version of the Modified Jones Model;
  ABS_PMACA = absolute value of performance-matched abnormal current accruals;
  ABS_DD = absolute value of accrual estimation errors using the Dechow and Dichev (2002) model;
  ABS_MDD = absolute value of accrual estimation errors using the extended version of Dechow and Dichev (2002) model as suggested by McNichols (2002);
  SIZE = natural logarithm of total assets;
  BM = ratio of book value of equity to market value;
  SGROWTH = change in current year's sales divided by lagged sales;
  ROA = return on assets measured as earnings before extraordinary items divided by average total assets;
  OCF = operating cash flow scaled by lagged assets;
  AU = indicator variable takes a value of 1 if the firm is audited by one of the Big 4 auditors, and 0 otherwise;
  DE = debt-equity ratio; and
  OPCYCLE = natural logarithm of the length of operating cycle measured as the sum of average days of account receivable and average days of inventory.

All continuous variables (except log transformed variables) are winsorized at 1 percent and 99 percent.

(8.7 percent) of our sample in 2004 (2005). The mean (median) absolute performance-matched abnormal total accruals and current accruals are 0.053 (0.035) and 0.048 (0.029) respectively for firms with female CFOs, compared with 0.59 (0.038) and 0.054 (0.032) respectively for firms with male CFOs. Univariate tests of differences show that magnitudes of both abnormal accruals measures, *ABS_PMATA* and *ABS_PMACA*, are significantly smaller (p = 0.078 and p = 0.056, respectively for mean tests and p = 0.037 and p = 0.107 for median tests) for firms with female CFOs compared with firms with male CFOs. Similarly, the accrual quality measures based on accrual estimation errors (*ABS_DD* and *ABS_MDD*) are significantly smaller (p < 0.001 and p = 0.013, respectively for mean tests and p = 0.018 and p = 0.129 for median tests) for firms with female CFOs compared with firms with male CFOs. These univariate results are consistent with our hypothesis; however, these results are preliminary, and inferences can be made only after we control for other factors in our regression models.

Table 2 also provides mean and median values of control variables and univariate tests of differences between two subsamples based on CFO gender. Mean (Chi-square) tests indicate that the two groups differ significantly with respect to *BM* (*AU*); tests of difference in medians indicate that the two groups differ significantly along *SGROWTH*, *ROA*, and *OCF*.[7]

Regression Results

Performance-Matched Abnormal Accruals
We estimate Equation (5) using all observations with available data by using two measures as dependent variables: absolute performance-matched abnormal total accruals (*ABS_PMATA*) and current accruals (*ABS_PMACA*).[8] Regression results are presented in Table 3. Consistent with prior studies (e.g., DD 2002; Francis et al. 2008), the coefficients of *SIZE*, *ROA*, and *BM* are significantly negative (p < 0.001, p < 0.001, and p < 0.01, respectively) in both regressions. Consistent with Menon and Williams (2004), the coefficient of *SGROWTH* is positive and significant in both estimations, suggesting that recent sales growth is associated with higher level of abnormal accruals. Although the coefficients of *OCF* are positive and significant in both regressions, the coefficient of the quadratic term OCF^2 is also positive and highly significant (p < 0.0001) in both regressions, suggesting a U-shaped association between the accruals quality measures and *OCF*. Consistent with DD (2002), the coefficient of *OPCYCLE* is positive and significant, suggesting that firms with longer operating cycles are more likely to have higher levels of abnormal accruals.

The variable of interest, *FEMALECFO*, is negative and significant in both regressions (p = 0.05 for *ABS_PMATA* regression and p = 0.012 for *ABS_PMACA* regression). These results support our hypothesis that firms with female CFOs are associated with lower levels of absolute abnormal total accruals and abnormal current accruals.

Accrual Estimation Errors
Table 4 presents the results from estimating Equation (5) by using the accrual estimation error-based measures as dependent variables: *ABS_DD* and *ABS_MDD*. The coefficients of control variables, *SIZE*, *SGROWTH*, *ROA*, OCF^2, and *OPCYCLE* are significant and in the predicted directions, consistent with the results reported in Table 3. However, the coefficient of *BM* is not significant at conventional levels. The coefficient of *AU* is negative and significant in both regressions, suggesting that firms audited by Big 4 auditors are more likely to have higher quality of

---

[7] A correlation matrix shows that variables representing firm characteristics such as size (*SIZE*), book-to-market ratio (*BM*), performance (*ROA* = return on assets; *OCF* = operating cash flow), debt-equity ratio (*DE*), and auditors' quality (AU) all are significantly correlated (p < 0.05) with accrual measures.
[8] We also estimate both regressions for each year separately as additional analyses.

TABLE 3

Regression of Absolute Value of Performance-Matched Abnormal Accruals

Variable	PredictedSign	ABS_PMATA		ABS_PMACA	
		Coefficient	p-value	Coefficient	p-value
Intercept		0.044	0.000	0.064	<0.001
SIZE	−	−0.005	<0.001	−0.006	<0.001
BM	−	−0.013	0.003	−0.014	0.001
SGROWTH	+	0.019	<0.001	0.020	<0.001
ROA	−	−0.165	<0.001	−0.105	<0.001
OCF	?	0.125	<0.001	0.049	0.002
OCF^2	+	0.287	<0.001	0.324	<0.001
AU	−	−0.005	0.348	−0.009	0.056
DE	?	0.000	0.633	0.000	0.632
OPCYCLE	+	0.009	<0.001	0.007	<0.001
FEMALECFO	−	−0.007	0.049	−0.010	0.012
Adj. R^2		14.2%		14.5%	
No. of Observations		2,781		2,781	

p-value for *FEMALECFO* is based on one-tailed test; all other variables have two-tailed tests.

The sample consists of all nonfinancial firms with all required data available in the Compustat and Corporate Library databases. The table presents OLS regressions results of the following equation:

$AQ_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 BM_{it} + \alpha_3 GROWTH_{it} + \alpha_4 ROA_{it} + \alpha_5 OCF_{it} + \alpha_6 OCF_{it}^2 + \alpha_7 AU_{it} + \alpha_8 DE_{it} + \alpha_9 OPCYCLE_{it}$
$+ \alpha_{10} FEMALECFO_{it} + \varepsilon_{it}$ where *AQ* represents two accrual quality measures based on abnormal accruals.

ABS_PMATA is the absolute value of performance-matched abnormal total accruals and *ABS_PMACA* is the absolute value of performance-matched abnormal current accruals.

Variable Definitions:
- *SIZE* = natural logarithm of market value of equity;
- *BM* = ratio of book value of equity to market value;
- *SGROWTH* = changes in current year's sales divided by lagged sales;
- *ROA* = return on assets measured as earnings before extraordinary items divided by average total assets;
- *OCF* = operating cash flow scaled by lagged assets;
- *AU* = indicator variable takes a value of 1 if the firm is audited by one of the Big 4 auditors, and 0 otherwise;
- *DE* = debt-equity ratio;
- *OPCYCLE* = natural logarithm of the length of operating cycle measured as the sum of average days of account receivable and average days of inventory; and
- *FEMALECFO* = indicator variable takes a value of 1 if the CFO of the firm is female, and 0 otherwise.

accruals. The variable of interest, *FEMALECFO*, is negative and significant (p < 0.01) in both regressions. The results thus are consistent with the hypothesis that firms with female CFOs have higher quality of accruals.

Additional Analysis

Annual Regressions

We also estimate separate annual regressions for 2004 and 2005, with each of the above mentioned four accrual quality measures as the dependent variable. In the performance-matched abnormal accrual analyses with *ABS_PMATA* and *ABS_PMACA* as dependent variables, the sign

TABLE 4

Regression of Absolute Value of Accrual Estimation Errors

Variables	Predicted Sign	ABS_DD		ABS_MDD	
		Coefficient	**p-value**	**Coefficient**	**p-value**
Intercept	?	0.040	<0.001	0.057	<0.001
SIZE	−	−0.002	0.002	−0.002	<0.001
BM	−	−0.003	0.347	−0.005	0.103
SGROWTH	+	0.005	0.062	0.008	0.002
ROA	−	−0.041	<0.001	−0.039	<0.001
OCF	?	−0.001	0.918	0.007	0.527
OCF^2	+	0.165	<0.001	0.143	<0.001
AU	−	−0.012	0.000	−0.012	0.000
DE	?	−0.001	0.188	0.000	0.936
OPCYCLE	+	0.006	<0.001	0.003	0.044
FEMALECFO	−	−0.011	0.001	−0.008	0.010
Adj. R^2		8.5%		7.5%	
No. of Observations		2,622		2,622	

p-value for *FEMALECFO* is based on one-tailed test; all other variables have two-tailed tests.

The sample consists of all firms with all required data available in the Compustat and Corporate Library databases.

The table presents OLS regressions results of the following equation:

$AQ_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 BM_{it} + \alpha_3 GROWTH_{it} + \alpha_4 ROA_{it} + \alpha_5 OCF_{it} + \alpha_6 OCF^2_{it} + \alpha_7 AU_{it} + \alpha_8 DE_{it} + \alpha_9 OPCYCLE_{it}$
$+ \alpha_{10} FEMALECFO_{it} + \varepsilon_{it}$ where *AQ* represents two accruals quality measures based on accrual estimation errors.

ABS_DD = absolute value of accrual estimation errors using the Dechow and Dichev (2002) model; and *ABS_MDD* = absolute value of accrual estimation errors using the extended version of Dechow and Dichev (2002) model as suggested by McNichols (2002).

Variable Definitions:

  SIZE = natural logarithm of market value of equity;
  BM = ratio of book value of equity to market value;
  SGROWTH = changes in current year's sales divided by lagged sales;
  ROA = return on assets measured as earnings before extraordinary items divided by average total assets;
  OCF = operating cash flow scaled by lagged assets;
  AU = indicator variable takes a value of 1 if the firm is audited by one of the Big 4 auditors, and 0 otherwise;
  DE = debt-equity ratio;
  OPCYCLE = natural logarithm of the length of operating cycle measured as the sum of average days of account receivable and average days of inventory; and
  FEMALECFO = indicator variable takes a value of 1 if the CFO of the firm is female, and 0 otherwise.

and significance of the control variables are generally similar to those reported in Table 3.[9] The coefficient of *FEMALECFO* is negative and significant in the regressions for 2004 ($p < 0.05$ in both regressions) and 2005 ($p < 0.10$ in both regressions).

In the accrual estimation error-based regressions, with *ABS_DD* and *ABS_MDD* as the dependent variables, the variable of interest *FEMALECFO* is negative and significant in 2004 ($p < 0.01$ in both regressions) and 2005 ($p < 0.05$ in both regressions). The coefficients of all other variables are qualitatively similar to those reported in Table 4.

[9] The only difference is as follows: the coefficients of *BM* and *SGROWTH* are significant in 2005, consistent with the results presented for pooled regressions; however, these two variables are not significant in 2004.

Sensitivity Tests

Female CEO

In our sample, 43 firms have female CEOs; in seven firms both CEOs and CFOs are female. We rerun our regressions by including a *FEMALECEO* dummy variable, but this is not significant in our regressions, while *FEMALECFO* remains negative and significant as reported in our primary results. In addition, we conduct our analyses on subsamples formed by deleting observations where (1) both the CEO and CFO are female, or (2) the CEO is female. In such estimations, *FEMALECFO* is consistently negative and significant in line with the results reported in our main analyses.

CFO Changes and Accruals Quality

If the hypothesis that female CFOs are less aggressive is valid, we should see accruals quality improve (deteriorate) after a firm transitions from a male to a female (female-to-male) CFO. The 2006 edition of the Corporate Library database provides us with information about the gender and tenure of the CFO. Using such tenure data, we identify the year of a new CFO (regardless of the gender of the predecessor) from 1996 to 2002. We then use 10-K filings and news media to identify the gender of the predecessor CFO. We are able to identify the year of the change for 541 firms with adequate data to estimate all performance-matched abnormal accruals and accrual estimation errors for three years before and after the transition year. The number of CFO changes is as follows: (1) male-to-female, 36; (2) female-to-male, 19; (3) female-to-female, 21; and (4) male-to-male, 465.

For each instance of a firm hiring a new CFO, we consider the three years before and after (but not during the year of) the change. We then add three dummy variables in the various regression models discussed earlier: *POST*, *POST∗M−F*, and *POST∗F−M* (where *POST* = 1 after the CFO change and 0 before, *M−F* = 1 if the change was from a male to a female CFO, and 0 otherwise; *F−M* = 1 if the change was from a female to a male CFO, and 0 otherwise). We find that the coefficient of *POST* is negative (-0.007 in both the total and current accruals regressions) and significant ($p < 0.01$, in each instance) in the models, indicating that accruals quality is higher in the initial years of a CFO. More interestingly, *POST∗M−F* is negative (-0.008) and significant in the regression ($p < 0.10$) with total accruals suggesting an incremental gender effect; the interaction term is negative but not significant at conventional levels in the regression with absolute value of abnormal current accruals as the dependent variable. In each of the two accrual estimation error models, the *POST* variable is not significant, but the *POST∗M−F* is negative (-0.008) and significant ($p < 0.05$).

CFO Expertise

Aier et al. (2005) find that CFO financial expertise (experience, education, and certification) is negatively associated with the incidence of earnings restatements. CFO gender may proxy for CFO financial expertise that could be the driving force for the results documented earlier in this paper. To rule out this alternative explanation, we obtain data about the certification (CPA or not), education (M.B.A. or not), and experience (tenure as CFO) and include these three variables in the accruals regressions.[10] We find that the education and certification variables are not significant in any of the regressions for our sample; the experience measure is significant in the regression with absolute value of accruals as the dependent variable. More importantly, the *FEMALECFO* variable is negative and significant in every regression with these additional variables.

---

[10] We also conduct univariate correlations analyses between CFO gender (*FEMALECFO*) and CFO certification (CPA or not), education (M.B.A. or not), and experience (tenure as CFO). The correlation coefficients between *FEMALECFO* and the three expertise measures are 0.042, 0.035, and -0.039, respectively.

SUMMARY AND CONCLUSIONS

Enron, WorldCom, and other recent instances of fraudulent financial reporting have drawn legislators' and regulators' attention to the fact that the CFO has substantial control over a firm's financial reporting. Spurred by such recognition, multiple sections of SOX require individual certifications from the CFO and CEO about the financial reporting process and results. Such legislative attention has led to research examining the association between CFO characteristics and financial reporting quality (Dowdell and Krishnan 2004; Aier et al. 2005; Geiger and North 2006; Geiger et al. 2008).

In this paper, we examine the association between CFO gender and the quality of accruals. Our study is spurred by evidence from prior studies indicating that females are more cautious and less aggressive in a variety of business and finance settings. If females are less aggressive (or more cautious), then firms with female CFOs are likely to have lower absolute abnormal accruals. We test this hypothesis using data from 1,559 (1,222) firms during 2005 (2004). We find that, after controlling for factors shown to be associated with accruals, firms that have female CFOs report lower levels of absolute abnormal (total and current) accruals and lower accrual estimation errors.

Our study is subject to the following limitations. First, our sample includes only those companies that are included in the Corporate Library database, and such firms tend to be larger. Second, while we employ accruals models that have been used in prior research, such models are always subject to measurement errors. Another issue is that perhaps other underlying factors are simultaneously associated with both the employment of a female CFO and higher quality financial reporting. Although we have controlled for factors known to be associated with accruals, and although our data show no significant differences between companies based on CFO gender in terms of the control variables (other than auditor type), it is always possible that other (possibly unobservable) factors are correlated with both the hiring of a female CFO and higher quality of accruals.

The proportion of females entering the accounting profession has increased steadily in recent years, such that females constitute about half of accounting graduates and those passing the CPA exam.[11] Yet, we find that females constitute only a small proportion of CFOs of public companies. Taken together with our results suggesting that companies with female CFOs are more likely to have higher accruals quality, the data potentially have implications for executive recruiters and their hiring decisions.

Our findings also suggest possible avenues for further research. Do observable gender differences appear in other accounting or auditing contexts? For example, do women managers and partners in audit firms make, on average, more cautious or less aggressive decisions? Also, research and anecdotal evidence suggest that the Sarbanes-Oxley Act has led to significant changes in the environment of accounting and auditing. Did SOX, for example, have a differential impact on female CFOs and auditors than on male CFOs and auditors, respectively? Another fruitful avenue for future research is to use other proxies for financial reporting quality (such as restatements, SEC enforcement actions, and shareholder litigation) to test whether similar patterns in financial reporting quality exist based on the gender of the CFO.

REFERENCES

Aier, J. K., J. Comprix, M. T. Gunlock, and D. Lee. 2005. The financial expertise of CFOs and accounting restatements. *Accounting Horizons* 19 (3): 123–135.

---

[11] Women account for 57 percent (54 percent) of recent accounting graduates (new hires in public accounting firms) (Vigilante 2005). Grant (2008) reports that women outnumber men in the AICPA membership professional entry age cohort.

Ashbaugh, H., R. LaFond, and B. Mayhew. 2003. Do non-audit services compromise auditor independence? *The Accounting Review* 78 (3): 611–639.

Bajtelsmit, V. L., and J. L. VanDerhei. 1997. Risk aversion and pension investment choices. In *Positioning Pensions for the Twenty-First Century*, edited by Gordon, M. S., O. S. Mitchell, and M. M. Twinney. Philadelphia, PA: University of Pennsylvania Press.

Baldry, J. C. 1987. Income tax evasion and the tax schedule: Some experimental results. *Public Finance* 42: 357–383.

Barber, B. M., and T. Odean. 2001. Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics* 116 (1): 261–292.

Beasley, M. S., J. V. Carcello, and D. R. Hermanson. 1999. *Fraudulent Financial Reporting: 1987–1997, An Analysis of U.S. Public Companies*. New York: Committee of Sponsoring Organizations of the Treadway Commission (COSO).

Becker, C. L., M. L. DeFond, J. Jiambalvo, and K. R. Subramanyam. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15 (1): 1–24.

Bédard, J., S. M. Chtourou, and L. Courteau. 2004. The effect of audit committee expertise, independence, and activity on aggressive earnings management. *Auditing: A Journal of Practice & Theory* 23 (2): 13–35.

Bradshaw, M. T., S. A. Richardson, and R. G. Sloan. 2001. Do analysts and auditors use information in accruals? *Journal of Accounting Research* 39 (1): 45–74.

Byrnes, J. P., D. C. Miller, and W. D. Schäfer. 1999. Gender differences in risk taking: A meta-analysis. *Psychological Bulletin* 125 (May): 367–383.

Cohn, R. A., W. G. Lewellen, R. C. Lease, and G. G. Schlarbaum. 1975. Individual investor risk aversion and investment portfolio composition. *The Journal of Finance* 30 (2): 605–620.

Cullis, J., P. Jones, and A. Lewis. 2006. Tax framing, instrumentality and individual differences: Are there two different cultures? *Journal of Economic Psychology* 27 (2): 304–320.

Dechow, P. M., and I. Dichev. 2002. The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review* 77 (Supplement): 35–59.

———, R. G. Sloan, and A. P. Sweeney. 1995. Detecting earnings management. *The Accounting Review* 70 (2): 193–225.

DeFond, M. L., and J. Jiambalvo. 1994. Debt covenant effects and the manipulation of accruals. *Journal of Accounting and Economics* 17 (January): 145–176.

Dowdell, T., and J. Krishnan. 2004. Former audit firm personnel as CFOs: Effect on earnings management. *Canadian Accounting Perspectives* 3 (1): 117–142.

Estes, R., and J. Hosseini. 1988. The gender gap on Wall Street: An empirical analysis of confidence in investment decision making. *The Journal of Psychology* 122 (6): 577–590.

Fallan, L. 1999. Gender, exposure to tax knowledge, and attitudes towards taxation: An experimental approach. *Journal of Business Ethics* 18 (2): 173–184.

Fehr-Duda, H., M. de Gennaro, and R. Schubert. 2006. Gender, financial risk, and probability weights. *Theory and Decision* 60 (2–3): 283–313.

Francis, J., A. H. Huang, S. Rajgopal, and A. Zang. 2008. CEO reputation and earnings quality. *Contemporary Accounting Research* 25 (1): 109–147.

———, R. LaFond, P. Olsson, and K. Schipper. 2005. The market pricing of accruals quality. *Journal of Accounting and Economics* 39 (2): 295–327.

Geiger, M. A., C. S. Lennox, and D. S. North. 2008. The hiring of accounting and finance officers from audit firms: How did the market react? *Review of Accounting Studies* 13 (March): 55–86.

———, and D. S. North. 2006. Does hiring a new CFO change things? An investigation of changes in discretionary accruals. *The Accounting Review* 81 (4): 781–809.

Grant, J. 2008. Demographic challenges facing the CPA profession. *Research in Accounting Regulation* 20: 47–61.

Guenther, D. 1994. Earnings management in response to corporate rate changes: Evidence from the 1986 Tax Reform Act. *The Accounting Review* 69: 230–243.

Hansemark, O. C. 2003. Need for achievement, locus of control and the prediction of business start-ups: A longitudinal study. *Journal of Economic Psychology* 24 (3): 301–319.

Hinz, R. P., D. D. McCarthy, and J. A. Turner. 1997. Are women conservative investors? Gender differences in participant-directed pension investments. In *Positioning Pensions for the Twenty-First Century*, edited by Gordon, M. S., O. S. Mitchell, and M. M. Twinney. Philadelphia, PA: University of Pennsylvania Press.

Huang, J., and D. Kisgen. 2008. Gender and corporate finance. Working paper, Boston College.

Jones, K. L., G. V. Krishnan, and K. D. Melendrez. 2008. Do models of discretionary accruals detect actual cases of fraudulent and restated earnings? An empirical analysis. *Contemporary Accounting Research* 25 (2): 499–531.

Kasznik, R. 1999. On the association between voluntary disclosure and earnings management. *Journal of Accounting Research* 37 (1): 57–81.

Klein, A. 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics* 33 (2): 277–432.

Kothari, S. P., A. L. Leone, and C. E. Wasley. 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39 (1): 163–197.

Lenney, E. 1977. Women's self-confidence in achievement settings. *Psychological Bulletin* 84 (1): 1–13.

McNichols, M. 2002. Discussion of the quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review* 77 (Supplement): 61–69.

Menon, K., and D. D. Williams. 2004. Former audit partners and abnormal accruals. *The Accounting Review* 79 (October): 1095–1118.

Olsen, R. A., and C. M. Cox. 2001. The influence of gender on the perception and response to investment risk: The case of professional investors. *The Journal of Psychology and Financial Markets* 2 (1): 29–36.

Pincus, M., and S. Rajgopal. 2002. The interaction between accrual management and dredging: Evidence from oil and gas firms. *The Accounting Review* 77 (1): 127–160.

Powell, M., and D. Ansic. 1997. Gender differences in risk behavior in financial decision-making: An experimental analysis. *Journal of Economic Psychology* 18 (6): 605–628.

Riley, W. B., and K. V. Chow. 1992. Asset allocation and individual risk aversion. *Financial Analysts Journal* 48: 32–37.

Sexton, D. L., and N. Bowman-Upton. 1990. Female and male entrepreneurs: Psychological characteristics and their role in gender-related discrimination. *Journal of Business Venturing* 5 (1): 29–36.

Subramanyam, K. R. 1996. The pricing of abnormal accruals. *Journal of Accounting and Economics* 22 (1–3): 249–281.

Sunden, A. E., and B. J. Surette. 1998. Gender differences in the allocation of assets in retirement savings plans. *The American Economic Review* 88 (2): 207–211.

Sweeney, A. P. 1994. Debt-covenant violations and managers' accounting responses. *Journal of Accounting and Economics* 17 (3): 281–308.

Teoh, S. H., I. Welch, and T. J. Wong. 1998. Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics* 50: 63–99.

U.S. House of Representatives, Committee on Financial Services. 2002. Sarbanes-Oxley Act of 2002. Public Law No. 107–204. Washington, D.C.: Government Printing Office.

Vigilante, B. 2005. Women at full throttle. *Journal of Accountancy* 200 (4): 76–77.

Watson, J., and M. McNaughton. 2007. Gender differences in risk aversion and expected retirement benefits. *Financial Analysts Journal* 63 (4): 52–62.