# Why are CFO insider trades more informative?

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## Abstract

**Purpose** – The authors examine whether the stronger information content of chief financial officer (CFO) insider trading relative to that of chief executive officers (CEOs) results from a different willingness to exploit the information asymmetry that exists between executives and outside shareholders (scrutiny hypothesis) or from differing financial acumen between CFOs and CEOs (financial acumen hypothesis). The authors consider the information content of equity purchases for CEOs and CFOs. The paper aims to discuss these issues.

**Design/methodology/approach** – The authors examine purchase-based insider trading portfolio returns before and after the implementation of SOX in firms with high versus low regulation, for routine and opportunistic managers, and in samples of CEOs with prior CFO experience.

**Findings** – The authors provide evidence that SOX affected executives differently and provide support for the scrutiny hypothesis. CFO-based portfolios remain the most profitable post-SOX, but the magnitude of returns has fallen in absolute and relative terms compared to returns for CEOs. Superior financial acumen of CFOs does not appear to be supported. CEO purchase trade returns appear to be lower than CFO returns because CEOs face greater visibility and scrutiny and thus limit their own trading aggressiveness.

**Originality/value** – This research contributes to the literature in explaining why CFOs best CEOs in their insider trading purchases and documents that in the post-SOX period, CFO insider trading superiority disappears.

**Keywords** Insider trading, CEO, CFO, Executive roles, Executives, Insider rank

**Paper type** Research paper

## Introduction and hypothesis development

Lakonishok and Lee (2001) find insider trades to be informative, providing evidence that insiders appear able to beat the market when transacting in their firm's shares. The highest explanatory power for future returns comes from managers relative to large shareholders and other affiliated insiders. Previous studies have documented the predictive power of insider trading as a whole (Seyhun, 1986; Lakonishok and Lee, 2001;

Bharath *et al.*, 2009). However, managers are not one homogenous group. Indeed, Seyhun (1986) pioneered this analysis by investigating different groups of insiders (directors, officers, officers/directors, large shareholders, and chairs of boards). Subsequent investigations have examined the trading of chief executive officers (CEOs) (Jenter, 2005), executives by gender (Bharath *et al.*, 2009), and executives in the UK (Fidrmuc *et al.*, 2006). Wang *et al.* (2012) show that chief financial officer (CFO) stock purchases are more profitable than CEO stock purchases. The contribution of our study is to determine why certain managerial insider trades appear more informative. We consider the trades of CEOs and CFOs. Both of these high-level executives have different roles, expertise, access to information, and visibility outside the firm.

Executive role has become an increasingly important topic of research, especially with the implementation of the Sarbanes-Oxley Act in 2002 (SOX)[1]. With the passage of SOX, the role of the CFO has taken on heightened significance because the CFO is now a required signatory for a firm's audited financial statements, along with the CEO. In December 2006, the securities and exchange commission published new rules that required additional executive compensation disclosures in the firm's annual proxy statement for principal executive officers, principal financial officers, and the next three most highly paid named executive officers[2]. Attention has begun to shift toward the CFO and his unique position as another key player in the firm. In fact, evidence indicates that CFO characteristics, such as compensation and equity ownership, might be related to firm governance and profitability. Specifically, Hoitash *et al.* (2012) investigate CFO compensation and its relation to internal control, material weakness disclosures, corporate governance, external monitoring, and firm risk. In addition, Jiang *et al.* (2010) find that CFO equity heightened sensitivity to the size of accruals and the likelihood of beating analysts' forecasts. These results indicate that CFOs could engage in more profitable insider trading than CEOs. Finally, Wang *et al.* (2012) find that CFO purchases are more strongly associated with positive future earnings surprises than are CEO purchases, indicating CFOs use better information about future earnings in their insider trading.

This paper examines possible explanations for CFO-based insider trades being more informative than CEO insider trades. Wang *et al.* (2012) offer two possible explanations for superior CFO trading: information advantage and more restraint on behalf of the CEO because of his prominence in the firm. In their earnings test, they provide evidence of the higher use of information asymmetry, but their test could also be interpreted as CEO restraint during a sensitive time. Thus, we explore whether the CFO trading dominance is the result of better trading ability or CEO trading inhibition because of stronger investor visibility and scrutiny. Our hypotheses are as follows:

*H1.* Portfolios based on the insider trades of CFOs outperform portfolios based on the insider trades of CEOs because CEOs face higher visibility of investors, constraining trading behavior (scrutiny hypothesis).

*H2.* Portfolios based on the insider trades of CFOs outperform portfolios based on the insider trades of CEOs because CFOs have better financial acumen (financial acumen hypothesis).

To focus on the more informative trades, we consider those trades in which insiders trade alone (without another executive trading during the same window). That is, we cannot test for the differences in trade motivation when the CEO and CFO make the

same trade. The test was structured this way to remove corroborated signals. The intent is to pick up when, for some reason, CEOs and CFOs decide to trade in a different fashion. The question is whether the difference indicates a different skill or different propensity to capitalize on inside information. By using unique signals only, the common part of the signal is ignored allowing focus on differences. Our research question examines whether CFO insider trading profitability exceeds CEO insider trading profitability because of reduced scrutiny of the CFO relative to the CEO or because of superior skill on the part of CFOs.

To test the hypotheses, we create executive trading samples that either are similar in visibility but different in financial acumen or are similar in acumen but vary in visibility. We then test for differences in trading returns. First, we verify the outperformance of CFOs relative to CEOs noted by Wang *et al.* (2012). Second, we examine insider returns before and after SOX implementation because SOX implementation represented a change in CFO scrutiny. Third, we test return differences in highly and lightly regulated firms because they vary in terms of CEO scrutiny. Fourth, we adopt the classification of routine versus opportunistic trades of Cohen *et al.* (2012) to test further the scrutiny hypothesis. Last, we examine the returns for CEOs with financial acumen from CFO experience prior to becoming CEOs.

We use the implementation of SOX, a significant regulatory event that affected all executives to some degree but especially CEOs and CFOs. We study both the pre-SOX and post-SOX periods to offer additional evidence about the nature of the return differences across executive role trades. Wang *et al.* (2012) study only the pre-SOX period. However, SOX reduced the time to report an insider trade. Bhabra and Hossain (2011) study the informativeness of this time reduction (specifically before and after the events of 2007-2009) and conclude the information content of insider trading strengthened after SOX and was especially strong in the period coming out of the credit crunch. They use a rough measure of insider rank and show it is an important factor in understanding the improved price informativeness.

To investigate our hypotheses, we use SOX as an event for understanding the relative severity of agency conflict. SOX shortened the insider trading reporting time and thrust CFOs into the spotlight with potential personal liability (along with CEOs) for financial reporting misstatements. Our findings indicate senior executives (CEOs and CFOs) were dissimilarly affected by the new requirements of SOX, as evidenced by the profitability of trades before and after SOX. We support the findings of Wang *et al.* (2012) with CFO-based purchase portfolios beating CEO-based purchase portfolios during the pre-SOX period.

Our contribution is to determine the nature of the differences in insider trading profitability across executives reflects executives avoiding scrutiny in their trades. When SOX tightened oversight of CFOs, their profitability declined and converged with that of CEOs, consistent with CFOs restraining their trading to avoid investor scrutiny. Prior to SOX, the magnitude of the excess return was higher. After SOX was implemented, CFO profitability was attenuated, and the differences between CFO- and CEO-based portfolios disappeared.

The organization of the paper is as follows. Section 1 is a review of the relevant literature; Section 2 includes discussion of the data and portfolio formation methodology; Section 3 addresses the profitability of role-based insider-trading portfolios; Section 4

includes discussion of the scrutiny hypothesis; Section 5 includes discussion of the financial acumen hypothesis; Section 6 concludes.

## 1. Literature review

The information content of an insider trade can signal executive assessment of firm valuation to the market. A sufficient number of such trades (interfirm or aggregated across firms) provides a strong signal. At the individual level, the problem is to ascertain what portion if any of an executive's trade contains actual information. Assuming investors can isolate the information content, the question becomes whether one can benefit from trading on this information.

Early studies on insider trading focused on return prediction from insider trades (Lorie and Niederhoffer, 1968; Jaffe, 1974). Seyhun (1986, 1988) examine the question of whether investors can profit from insider trades and find that mimicking aggregate insider trading is not profitable after incorporating transactions costs. Seyhun (1992) provides both cross-sectional and time-series evidence of the predictive ability of insider trading after incorporating changing business conditions. Rozeff and Zaman (1998) investigate insider transactions, forming portfolios based on value and growth classifications. They find insiders buy when their firms are value firms and sell when their firms are growth firms, indicating that insiders are trading against deviations from fundamental value.

Lakonishok and Lee (2001) note that insiders in the aggregate are contrarians, but the effect in the cross-section principally stems from small firm returns. Furthermore, the strongest predictive content emanates from purchases, not sales. Jeng *et al.* (2003) recast the question of trading profitability from the insider's point of view. Sales are not found to be profitable, but insiders experience abnormal returns of greater than 6 percent per year with their purchases. In addition, Ravina and Sapienza (2010) examine the trades of independent directors and compare their price informativeness to that of their own firm's executives. They find that these independent directors capture excess returns.

Roulstone (2003) examines firm-level restrictions placed on insiders and reports that firms compensate insiders for their reduced liquidity because of firm-level trading restrictions. Henderson (2011) extends Roulstone's work by investigating 10b5-1 trading plans (planned trades) to appreciate the relation between CEO pay and CEO insider trades. Henderson's test distinguishes between liquidity-motivated trading and information-motivated trading, finding that CEOs apparently engaged in more information-based trades are less well compensated, indicating boards factor in information-based trading as implicit compensation. Piotroski and Roulstone (2005) investigate insider trades and observe incremental power in both the contrarian nature of insider trading and insiders' pre-dispositions to trade on superior cash-flow information.

Brochet (2010) studies the information content of insider trades in relation to the adoption of the Sarbanes-Oxley Act, finding the improvement to disclosure resulted in an improvement to price efficiency from the more timely reporting and an apparent reduction to opportunistic trading by insiders. Our study is closely related to the work of Wang *et al.* (2012), who find that CFO purchases are more profitable than CEO purchases. They also find that CFO purchases are more strongly associated with positive future earnings surprises than are CEO purchases, indicating CFOs use better

information about future earnings in their insider trading. The sample period of Wang *et al.* (2012) includes only pre-SOX trades. Our study demonstrates incorporating the post-SOX period updates their findings. In addition, we offer evidence concerning why CFO trades are more informative than CEO trades and how the new regulatory environment under SOX appears to have strengthened corporate governance in terms of insider trading.

## 2. Data and methodology
This study covers the period of 1992-2009 and includes all firms reporting insider-trading activity to the SEC with a reported role associated with such reporting events. To make inferences between the pre- and post-SOX portfolio returns, we use data from firms that survived the entire period between 1992 and 2009. The SEC requires that insiders (officers, directors, and large and affiliated shareholders) electronically disclose ownership (form 3), changes in ownership (form 4), and annual updates of ownership (form 5) by the second day following disposition of shares[3]. Thomson Financial's Value-Added Insider Data Feed provides trade-level data from which we form insider-trading portfolios. Stock returns come from the Center for Research in Security Prices (CRSP).

Table I shows sample selection information for the insider trades used in this study. We begin with the universe of insider trades in Thomson Financial's Value-Added Insider Data Feed with cleanse codes of R, H, and L, following Knewtson *et al.* (2010). We then remove amended and duplicate filings and subset on open-market purchases. Lakonishok and Lee (2001) exclude trades for which share prices fall below \$2 per share, trades involving less than 100 shares, trades that involve more than 20 percent of

| | |
|---|---:|
| Thomson Financial's Insider Data Feed (1992-2009), cleanse codes R, H, L | 5,725,461 |
| Less: amended/duplicate filings | 405,377 |
| | 5,320,084 |
| Filter: open-market purchases only | 4,634,340 |
| | 685,744 |
| Less: trades excluded using methodology of Lakonishok and Lee (2001) | 77,585 |
| | 608,159 |
| Filter: managers only | 183,221 |
| | 424,938 |
| Filter: firms that survive full sample period requirement (1992-2009) | 308,059 |
| Sample (managers) | 116,879 |
| Sample (CEOs and CFOs) | 17,340 |

**Notes:** This table shows sample selection information for the insider trades of managers used in this study; we begin with the universe of insider trades in Thomson Financial's Value-Added Insider Data Feed with cleanse codes of R, H and L, following Knewtson *et al.* (2010); we then remove amended and duplicate filings and subset on open-market purchases; Lakonishok and Lee (2001) exclude trades for which share prices fall below \$2 per share, trades involving less than 100 shares, trades that involve more than 20 percent of shares outstanding, and large volume trades in which the trade price differs from the daily close price by greater than 20 percent; we lose approximately 10 percent of trades by applying this filter; we also limit the sample to manager trades, thereby removing director trades; consistent with Lakonishok and Lee (2001), we focus on the more informative purchase-based trading portfolios; to make inferences between the pre- and post-SOX portfolio returns, we use data from firms that survived the entire period between 1992 and 2009

**Table I.**
Sample selection

shares outstanding, and large volume trades in which the trade price differs from the daily close price by greater than 20 percent. We lose approximately 10 percent of trades by applying this filter. We also limit the sample to manager trades, thereby removing director trades. Consistent with Lakonishok and Lee (2001), we focus on the more informative purchase-based trading portfolios. The evidence for differences in sales-based portfolios is very limited, with the insider opportunism results of Cohen *et al.* (2012) serving as a recent exception. The managerial sample includes 116,879 purchase trades, and the CEO and CFO sample includes 17,340 purchase trades.

To construct cleaner tests, we retain purchase trades on a trading date if and only if they represent independent trades by CEOs and CFOs. For example, if the CEO of a certain firm purchased shares on January 2, 1992, we include his purchase only if the CFO of that same firm had not purchased shares that day or the subsequent four trading days (January 3, 6, 7, and 8). Therefore, the remaining purchases of CEOs represent independent buy signals (independent of CFOs). The same process is applied to CFO trades (independent of CEO trades). We chose a five-day trading window to ensure executives were more likely acting on purchase decisions made independent of one another, rather than executing trades based on similar news within a few trading days of one another. We ran robustness tests that excluded (within each firm) same-day trades (one trading day), same day and two subsequent days (three trading days), same day and six subsequent days (seven trading days), and same day and nine subsequent days (ten trading days). The results were similar across all these windows.

To test the hypotheses, a measure of abnormal returns was selected. Given the overlapping nature of insider trades in calendar time, adopting a buy and hold abnormal return (BHAR) approach for longer term returns would produce overstated test statistics (Barber and Lyon, 1997). Therefore, we use a return benchmark better suited for this study. We adopt the calendar-time portfolio approach used by Bharath *et al.* (2009), adapted from Barber and Odean (2001) for calculating portfolio returns for CEOs, CFOs, and the differences between CFOs and CEOs.

Our approach differs from prior insider-trading studies because our task is focused on understanding behavioral differences in trading rather than attempting to quantify differences with which to construct portfolios based on executive roles. Wang *et al.* (2012) establish that differences exist between CEO and CFO portfolio returns. To explain managerial behavior, we are focused on learning why such differences exist.

Both trade value and equally weighted portfolio returns are computed using 50 trading day estimation and 50-day return windows[4]. As a trade-value weighted example, assume that, on a certain trading date, two CEOs traded in the 50 days leading up to the trading date. Over those 50 prior trading days, the first executive purchased $100,000 of his firm's stock, and the second executive purchased $50,000 of his firm's stock. These purchases result in a 2/3 ($100,000/$150,000) weight for the first executive's firm and a 1/3 ($50,000/$150,000) weight for the second executive's firm. The equal weights would be 1/2 for each firm. Using weights from the estimation window, the portfolio return becomes the weighted average of daily returns of two firms over the post-trade 50 days. Each portfolio is formed for 50 days, and a new portfolio is formed each day. This approach results in the formation of 50 daily portfolio returns per trading day. Finally, the time series of daily returns are formed by taking the simple average of the 50 portfolio returns by trading day, resulting in one daily portfolio return per trading day across the entire time series of the study.

This procedure is applied to both trade value and equal weighted portfolios for each mutually exclusive group of executives: CEOs and CFOs[5]. In some cases, a reported insider purchase indicates an executive holds these two roles simultaneously. Disjoint roles are required to distinguish portfolio returns across pairs of roles. If a trade is attributed to more than one role, the trade is deleted from this analysis. Using portfolio returns, we estimate the Carhart (1997) four-factor model for each role to detect abnormal returns:

$$R_{pt} - R_{ft} = \alpha_{pt} + \beta_1(R_{mt} + R_{ft}) + \beta_2(SMB_t) + \beta_3(HML_t) + \beta_4(UMD_t) + \epsilon_t, \quad (1)$$

where $R_{pt}$ is the portfolio return, $R_{ft}$ is the risk free rate, $R_{mt}$ is the market benchmark return, and $\alpha_{pt}$ is the daily abnormal return from the regression[6]. The four-factors (excess market returns, size, value/growth, and momentum) are obtained from the data published on Ken French's web site[7].

Table II shows summary statistics for the insider trades from Thomson Financial's Value-Added Insider Data Feed (1992-2009). Columns include open-market purchases for all managers (officers and directors), CEOs, and CFOs. Each panel shows a summary of the dollar value of equity purchases (in constant 1,984 dollars), the number of purchases, the average value of purchases, and the number of firms that

| Managerial role | Purchases | | |
| --- | --- | --- | --- |
| | All | CEO | CFO |
| *Panel A: 1992-2009* | | | |
| Value ($ millions) | 6,221 | 986 | 86 |
| Number of purchases | 116,879 | 13,049 | 4,291 |
| Average value ($ millions) | 0.0532 | 0.0755 | 0.0200 |
| Number of firms | 1,883 | 1,134 | 898 |
| *Panel B: pre-SOX* | | | |
| Value ($ millions) | 3,569 | 606 | 53 |
| Number of purchases | 59,101 | 5,223 | 2,135 |
| Average value ($ millions) | 0.0604 | 0.1161 | 0.0247 |
| Number of firms | 1,733 | 1,134 | 612 |
| *Panel C: post-SOX* | | | |
| Value ($ millions) | 2,652 | 379 | 33 |
| Number of purchases | 57,778 | 7,826 | 2,156 |
| Average value ($ millions) | 0.0459 | 0.0485 | 0.0151 |
| Number of firms | 1,736 | 775 | 511 |
| *Panel D: percentage changes (SOX)* | | | |
| Average value ($ millions) | $-0.2398$ | $-0.5826$ | $-0.3856$ |

**Notes:** This table shows summary statistics for insider trades from Thomson Financial's Value-Added Insider Data Feed (1992-2009); columns include open-market purchases for all managers (officers and directors), CEOs and CFOs for firms that survived the entire sample period between 1992 and 2009; each panel shows a summary of the dollar value of equity purchases (in constant 1,984 dollars), the number of purchases, the average value of purchases, and the number of firms that experienced purchases; Panel A shows this information for January 1, 1992 to December 31, 2009; Panels B and C show information for purchases prior to the implementation of SOX (January 1, 1992 to August 28, 2002) and after implementation of SOX (August 29, 2002 to December 2009), respectively; Panel D shows the percentage changes in the average value of shares purchased between the pre- and post-SOX periods

experienced purchases[8]. Panel A shows this information for January 1, 1992 to December 31, 2009. Panels B and C show information for purchases prior to the implementation of SOX (January 1, 1992 to August 28, 2002) and after implementation of SOX (August 29, 2002 to December 31, 2009). Panel D shows the percentage changes in the average value of shares purchased between the pre- and post-SOX periods.

CEOs are the strongest purchasers. As shown in Panel A, between 1992 and 2009, the average value of CEO purchases was $75,500, comprising 15.8 percent of the dollar value of managerial insider purchases. By comparison, CFOs had an average purchase amount of $20,000 for 1.4 percent of the dollar value of purchase trades. Panels B and C show the pre- and post-SOX periods covered in this study. SOX required more rapid reporting of insider trades to the SEC for all insiders, similarly affecting CEOs and CFOs. Potential sanctions against CEOs and CFOs were instituted to mitigate the agency conflict these named executives experience given their dominance as heads of firms and of finances, respectively. As indicated in Panel D, managers as a group show a 24 percent decrease in the average value of purchases. CEOs had a 58 percent decrease in average purchase value, and CFOs experienced a decrease of nearly 39 percent in their average value of purchases.

The univariate analysis indicates that these senior executives were unequally affected by the implementation of SOX. Next, we consider multivariate analysis of different portfolio returns to understand why certain insiders appear to have better predictive power over future firm returns. Then, we test our hypotheses.

## 3. Profitability of role-based insider-trading portfolios
First, we demonstrate that positive abnormal returns are found by forming portfolios based on purchases. This section discusses regression results for daily return portfolios formed for CEOs and CFOs and difference portfolios of CFOs and CEOs. To form portfolios, we use the presence of insider trades in a 50-day estimation window to form trade value and equal weights. These weights are applied to a forward portfolio for 50 trading days to find the daily returns the holder of a portfolio would realize. Daily return portfolios are formed across the two executive role groups. Because of the overlapping nature of these portfolio returns, all regressions use Newey and West (1987) *t*-statistics that correct for autocorrelation and heteroscedastiscity.

### 3.1 Regressions by executive role: CEOs, CFOs, and differences
Table III shows regression results of returns for portfolios that follow the insider trades of CEOs and CFOs and differenced CFO and CEO portfolio returns using the calendar-time portfolio approach of Barber and Odean (2001) for the period 1992-2009. Purchase-based trade value and equally weighted portfolio regression results are provided. SOX was implemented on August 29, 2002. We remove the four-month window surrounding SOX to form cleaner portfolios. Results are shown for three periods: January 1, 1992 to December 31, 2009 (full period), January 1, 1992 to June 30, 2002 (pre-SOX), and November 1, 2002 to December 31, 2009 (post-SOX). We control for the risk factors using the Carhart (1997) four-factor model. Basis points (monthly) are calculated by compounding daily estimates to monthly returns (20 trading days per month).

In general, portfolios based on CFO purchases dominate those based on CEO purchases. From 1992 to 2009, CEO-based purchase portfolios yielded an excess

Dependent variable – daily returns of purchase-based insider trading portfolios

| | Panel A: CEO | | | Panel B: CFO | | | Panel C: CFO – CEO | | |
|---|---|---|---|---|---|---|---|---|---|
| Model intercept | 1992-2009 | Pre-SOX | Post-SOX | 1992-2009 | Pre-SOX | Post-SOX | 1992-2009 | Pre-SOX | Post-SOX |
| Trade value weighted daily return | 0.000311** | 0.000550*** | −0.000020 | 0.000695*** | 0.000901*** | 0.000213 | 0.000390* | 0.000362 | 0.000237 |
| | (2.14) | (2.87) | (−0.11) | (4.06) | (3.57) | (1.32) | (1.87) | (1.28) | (0.91) |
| Basis points (monthly) | 62 | 111 | −4 | 140 | 182 | 43 | 78 | 73 | 48 |
| Equally weighted daily return | 0.000448*** | 0.000575*** | 0.000286*** | 0.000739*** | 0.001015*** | 0.000295*** | 0.000301*** | 0.000458*** | 0.000000 |
| | (7.74) | (7.24) | (3.50) | (11.21) | (10.33) | (3.73) | (4.28) | (4.31) | (0.11) |
| Basis points (monthly) | 90 | 116 | 57 | 149 | 205 | 59 | 60 | 92 | 0 |
| Number of daily portfolios | 4,541 | 2,600 | 1,853 | 4,565 | 2,624 | 1,853 | 4,541 | 2,600 | 1,853 |

**Notes:** Tests of significance that are valid at traditional levels of: *10, **5 and ***1 percent; this table shows regression results of returns for portfolios that follow the insider trades of CEOs, CFOs and differences between the CFO and CEO portfolio returns using the calendar-time portfolio approach of Barber and Odean (2001) for the period 1992-2009; purchase-based trade value and equally weighted portfolio regression results are provided; Panel A shows results for the CEO portfolio; Panel B shows results for the CFO portfolio; Panel C shows difference portfolios which take a long position in the CFO portfolio and a short position in the CEO portfolio; SOX was implemented on August 29, 2002; we remove the four-month window surrounding SOX to form cleaner portfolios; results are shown for three periods: January 1, 1992 to December 31, 2009 (full period), January 1, 1992 to June 30, 2002 (pre-SOX), and November 1, 2002 to December 31, 2009 (post-SOX); trade value (equal) weights are found by determining all insiders that engaged in purchases during a 50-day trading window and forming weights based on the dollar (equal) contribution to the portfolio; portfolio returns are then created by using weights against the next 50-days of firm level returns; we control for the risk factors using the Carhart (1997) four-factor model, using factors obtained from Ken French's web site; basis points (monthly) are calculated by compounding daily estimates to monthly returns (20 trading days per month); regression coefficients are reported with the associated *t*-statistic appearing in parentheses below the estimate

**Table III.**
Regression analysis for
insider trading
purchase-based portfolios
CEOs, CFOs and
differences

62 basis points per month (trade-value weighted, significant at the 5 percent level) and an excess 90 basis points per month (equally weighted, significant at the 1 percent level). Over the same period, CFO-based purchase portfolios yielded an excess 140 basis points per month (trade-value weighted) and an excess 149 basis points per month (equally weighted), both significant at the 1 percent level. CEO equally weighted returns fall by nearly half from the pre-SOX to the post-SOX period (116 to 57 basis points per month) and by over two-thirds for CFOs between the pre-SOX and the post-SOX period (205 to 59 basis points per month).

The differences between CFO and CEO portfolio returns appear in Panel C of Table III. The difference portfolio returns take a long position in the CFO portfolio and short the CEO portfolio, resulting in 60 excess basis points per month (equally weighted). The subperiod results show that, in the pre-SOX period, CFOs surpassed CEOs by 92 basis points per month (equally weighted), a significant result at the 1 percent level. No difference is shown between CFOs and CEOs in the post-SOX period for equally weighted portfolio returns, and no significant difference in the trade-value weighted returns. We provide the results in monthly basis points for comparability with previous insider trading studies. However, the persistence of the findings lasts for nearly one full quarter.

The evidence thus far is consistent with the findings of Wang *et al.* (2012) in that CFO-based purchase portfolios yield returns statistically greater than those for CEOs. For comparative purposes, Table 5 of Wang *et al.* (2012) shows return-weighted purchase portfolio returns for the Carhart (1997) four-factor model of 115 basis points for CEOs, 169 basis points for CFOs, and 53 basis points for the difference portfolio. The pre-SOX columns from Table III in this present paper closely matches their results, yielding 116 basis points for CEOs, 205 basis points for CFOs, and 92 basis points for the difference portfolio, based on the five-day window trade exclusion. Our sample is somewhat more restrictive than the sample of Wang *et al.* (2012) to enable differencing of pre- and post-SOX returns by removing some of the trades in the same firm within five trading days of one another.

Our overall findings for purchase-based insider trading portfolios are stronger than the findings of Wang *et al.* (2012) because we use a more restrictive definition of independent executive trades. Doing so removed a portion of the insider-trading signal from our sample. Our findings are reasonable given that correlated signals of executives are removed from the portfolios, leaving a more opportunistic portion of the trade. We conduct a test later to explore this opportunism. One of our contributions is to note that, in the post-SOX period, the superiority of CFO insider trading performance for purchase-based portfolios disappears.

SOX apparently acted as a mechanism to constrain information-based trading for purchases of senior executives. Despite the tightening of reporting requirements and the additional sanctions possible against CFOs and CEOs, excess returns remain for purchase-based portfolios for executives, although they disappear for differenced executive portfolios. The results of this test provide support for the scrutiny hypothesis.

*3.2 Post-SOX results and the credit crises of 2007-2009*
To ensure the results from this section were not driven by the credit crises of 2007-2009, we repeat the tests for the post-SOX period ending at the height of the real estate bubble (October 9, 2007), when the Dow Jones industrial average achieved

a historic value of 14,164.53. If our purchase results are driven by market lows in 2008 and 2009 (i.e. good timing of purchases in late 2008 and early 2009 when markets were at extreme lows), then structuring the tests to end at the market high biases against finding significant results. The results from this shorter post-SOX period (August 29, 2002 to October 9, 2007) are qualitatively similar, confirming the most recent market activity does not drive our results. For brevity, the results are not included as a separate table.

## 4. Scrutiny hypothesis
### 4.1 Evidence from firm regulation-based portfolios
We next examine the effect of the increased visibility of and scrutiny by regulators. Firms in industries subject to greater regulation have additional people and monitoring processes than more lightly regulated firms. If CEOs have as much financial acumen as CFOs, but limit their trading aggressiveness because of higher scrutiny, then they should be even more restrained when faced with the additional regulatory scrutiny. To test further whether CEOs respond to the higher scrutiny in a regulated firm, we split insider managers into two groups: those in firms with high regulation and those in firms with low regulation. We then investigate differences in insider-trading profitability.

It is a challenge to classify firms as either more or less regulated because all businesses endure some degree of regulation. For example, the Occupational Health and Safety Administration affects nearly every business entity in the USA. We do not attempt to distinguish the common component of regulation because it does not drive information asymmetry differences. Rather, certain firms operate in environments of additional scrutiny with regulators because of their positions as monopolists (utilities) and financial market makers (finance and insurance industries). Amir *et al.* (2000) study the value of analysts and deem that firms in the financial and utilities industries are considered heavily regulated. Thus, we adopt their classification of regulated firms to include financials and utilities. Firms outside of financials and utilities are classified as more lightly regulated.

Table IV shows regression results of returns for portfolios split by degree of regulation (non-financials/non-utilities vs financials and utilities) that follow the insider purchases of CEOs and CFOs and the differenced CFO and CEO portfolios using the calendar-time portfolio approach of Barber and Odean (2001) for the period 1992-2009. Firms not in the financials or utilities industries are classified as low-regulation firms (Panel A), and firms in the financials and utilities industries are classified as high-regulation firms (Panel B). Model 3 shows difference portfolios that take a long position in the CFO portfolio and a short position in the CEO portfolio. Again, we control for the risk factors using the Carhart (1997) four-factor model.

Panel A shows results for CEOs, CFOs, and differenced portfolios within the more lightly regulated industries. Consistent with the overall findings in Table III, CEO- and CFO-based purchase portfolios lose strength between the pre- and post-SOX periods. For example, CFO-based purchase portfolios fall from 230 (pre-SOX) to 74 (post-SOX) basis points per month (significant at the 1 percent level for equally weighted returns). The evidence for the long CFO and short CEO purchase difference portfolio supports a meaningful difference in returns for equally weighted portfolios. Across the period 1992-2009 and in the pre-SOX period, returns were statistically different from zero at

**Table IV.**
Regression analysis for insider trading purchase-based portfolios CEOs, CFOs and differences: split by degree of regulation

Dependent variable – daily returns of purchase-based insider trading portfolios

| Model intercept | Model 1: CEO | | | Model 2: CFO | | | Model 3: CFO – CEO | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1992-2009 | Pre-SOX | Post-SOX | 1992-2009 | Pre-SOX | Post-SOX | 1992-2009 | Pre-SOX | Post-SOX |
| *Panel A: low-regulation firms (non-financials/non-utilities)* | | | | | | | | | |
| Trade value weighted daily return | 0.000385 ** | 0.000551 *** | 0.000160 | 0.000807 *** | 0.001017 *** | 0.000323 * | 0.000370 | 0.000379 | 0.000164 |
| | (2.30) | (2.42) | (0.65) | (4.29) | (3.74) | (1.70) | (1.61) | (1.20) | (0.55) |
| Basis points (monthly) | 77 | 111 | 32 | 163 | 205 | 65 | 74 | 76 | 33 |
| Equally weighted daily return | 0.000561 *** | 0.000621 *** | 0.000503 *** | 0.000828 *** | 0.001137 *** | 0.000368 *** | 0.000267 *** | 0.000530 *** | – 0.000140 |
| | (7.41) | (6.25) | (4.54) | (9.85) | (9.63) | (3.50) | (2.97) | (4.06) | (– 1.16) |
| Basis points (monthly) | 113 | 125 | 101 | 167 | 230 | 74 | 54 | 107 | – 28 |
| Number of daily portfolios | 4,468 | 2,527 | 1,853 | 4,565 | 2,624 | 1,853 | 4,468 | 2,527 | 1,853 |
| *Panel B: high-regulation firms (financials/utilities)* | | | | | | | | | |
| Trade value weighted daily return | 0.000441 * | 0.000651 *** | 0.000161 | 0.000183 | 0.000368 ** | – 0.000150 | – 0.000210 | – 0.000220 | – 0.000310 |
| | (1.69) | (3.04) | (0.32) | (1.27) | (2.13) | (– 0.60) | (– 0.86) | (– 0.90) | (– 0.69) |
| Basis points (monthly) | 89 | 131 | 32 | 37 | 74 | – 30 | – 42 | – 44 | – 62 |
| Equally weighted daily return | 0.000310 *** | 0.000490 *** | 0.000057 | 0.000347 *** | 0.000465 *** | 0.000127 | 0.000083 | 0.000048 | 0.000070 |
| | (3.49) | (5.29) | (0.38) | (4.06) | (4.66) | (0.89) | (1.23) | (0.55) | (0.66) |
| Basis points (monthly) | 62 | 98 | 11 | 70 | 93 | 25 | 17 | 10 | 14 |
| Number of daily portfolios | 4,119 | 2,178 | 1,853 | 4,544 | 2,603 | 1,853 | 4,107 | 2,166 | 1,853 |

**Notes:** Tests of significance that are valid at traditional levels of: *10, **5 and ***1 percent; this table shows regression results of returns for portfolios, split by degree of regulation (non-financials/non-utilities vs financials and utilities) that follow the insider trades of CEOs, CFOs and differences between the CFO and CEO portfolio returns using the calendar-time portfolio approach of Barber and Odean (2001) for the period 1992-2009; firms not in the financials or utilities industries are classified as low-regulation firms (Panel A) and firms that are in the financials or utilities industries are classified as high-regulation firms (Panel B); purchase-based trade value and equally weighted portfolio regression results are shown; model 1 shows results for the CEO portfolio; model 2 shows results for the CFO portfolio; model 3 shows difference portfolios which take a long position in the CFO portfolio and a short position in the CEO portfolio; SOX was implemented on August 29, 2002; we remove the four-month window surrounding SOX to form cleaner portfolios; results are presented for three periods: January 1, 1992 to December 31, 2009 (full period), January 1, 1992 to June 30, 2002 (pre-SOX) and November 1, 2002 to December 31, 2009 (post-SOX); trade value (equal) weights are found by determining all insiders that engaged in purchases during a 50-day trading window and forming weights based on the dollar (equal) contribution to the portfolio; portfolio returns are then created by using weights against the next 50-days of firm level returns; we control for the risk factors using the Carhart (1997) four-factor model, using factors obtained from Ken French's web site; basis points (monthly) are calculated by compounding daily estimates to monthly returns (20 trading days per month); regression coefficients are reported with the associated *t*-statistic appearing in parentheses below the estimate

the 1 percent level. In the post-SOX period, after CFOs had become relatively more scrutinized, a significant difference in their returns was no longer evident.

Panel B shows the results of executive-pair differences within financials and utilities. In these industries, greater scrutiny is an important issue to executives. Although portfolios based on the trades of CEOs and CFOs as separate subgroups show evidence of excess returns, the pre-SOX period seems to drive the results. For example, CEO-based purchase portfolios yielded 98 basis points per month, and CFO-based purchase portfolios yielded 93 basis points per month for equally weighted returns in the pre-SOX period (significant at the 1 percent level in both cases). The difference portfolio (long CFO and short CEO) is not meaningfully different between executives in more highly regulated firms. When CFOs face increased regulatory scrutiny (post-SOX), their trading aggressiveness converges to that of CEOs. Again, support is found in these regulated differentiated tests for the scrutiny hypothesis.

### 4.2 Evidence from opportunistic executives

The evidence in Tables II-IV indicates both CEOs and CFOs act opportunistically in their personal portfolio trades. The effect is stronger for CFOs than for CEOs and appears to diminish in the post-SOX period. To test further for this opportunistic trading, we adopt the approach of Cohen *et al.* (2012) in classifying executives as either routine or opportunistic. The findings of Cohen *et al.* (2012) indicate the nonroutine trades of insiders show the most predictive power for future returns. They operationalize routine trades as trades in which insiders purchased shares in the same month over the previous three years (for trades with adequate trade history to have met this criterion). Trades that met this trade history criterion but did not satisfy the test of being routine were classified as opportunistic. We follow their procedure of classifying executives annually by considering whether opportunistic trades were detected for each insider, updated on an annual basis. This split our sample into two categories of opportunistic and routine executives.

Table V shows the results of our regression analysis for insider trading differenced executive portfolios split by degree of opportunism. Panel A shows opportunistic executive trades, and Panel B shows routine executive trades. Portfolios based on the trades of CEOs and CFOs as separate subgroups show evidence of excess returns, and the pre-SOX period seems to drive the results. For example, CEO-based purchase portfolios yielded 86 basis points per month, and CFO-based purchase portfolios yielded 171 basis points per month for equally weighted returns in the pre-SOX period (significant at the 1 percent level in both cases). The difference portfolio (long CFO and short CEO) indicates 50 basis points per month (significant at the 10 percent level for equally weighted returns). It appears to be driven by the pre-SOX period, with 97 excess basis points per month significant at the 1 percent level and no meaningful difference in the results for CEOs and CFOs in the post-SOX period. If the definition of opportunism includes more aggressive trading, then CFOs in the post-SOX period showed a much stronger decline in opportunism than CEOs.

Panel B shows the routine trades of CEOs and CFOs. Similar to the data in Panel A, Panel B indicates some evidence of abnormal returns for CEOs and CFOs, predominantly from the equally weighted returns. Again, returns from the pre-SOX period to the post-SOX period decline for both CEOs and CFOs. The difference portfolio shows marginally significant evidence (at the 10 percent level) that CFOs bested CEOs across

**Table V.**
Regression analysis for insider trading purchase-based portfolios CEOs, CFOs and differences: split by degree of opportunism

Dependent variable – daily returns of purchase-based insider trading portfolios

| | Model 1: CEO | | | Model 2: CFO | | | Model 3: CFO – CEO | | |
|---|---|---|---|---|---|---|---|---|---|
| Model intercept | 1992-2009 | Pre-SOX | Post-SOX | 1992-2009 | Pre-SOX | Post-SOX | 1992-2009 | Pre-SOX | Post-SOX |
| *Panel A: opportunistic executive trades* | | | | | | | | | |
| Trade value weighted daily return | 0.000578 *** | 0.000835 *** | 0.000307 | 0.000708 *** | 0.001035 *** | 0.000280 | 0.000155 | 0.000275 | − 0.000030 |
| | (2.92) | (3.18) | (1.04) | (3.83) | (4.97) | (0.93) | (0.58) | (0.81) | (− 0.07) |
| Basis points (monthly) | 116 | 168 | 62 | 143 | 209 | 56 | 31 | 55 | − 6 |
| Equally weighted daily return | 0.000406 *** | 0.000426 *** | 0.000404 *** | 0.000631 *** | 0.000850 *** | 0.000298 | 0.000248 * | 0.000484 *** | − 0.000110 |
| | (4.54) | (3.45) | (3.12) | (5.55) | (6.05) | (1.59) | (1.84) | (2.72) | (− 0.51) |
| Basis points (monthly) | 82 | 86 | 81 | 127 | 171 | 60 | 50 | 97 | − 22 |
| Number of daily portfolios | 4,180 | 2,293 | 1,853 | 4,425 | 2,485 | 1,852 | 4,160 | 2,220 | 1,852 |
| *Panel B: routine executive trades* | | | | | | | | | |
| Trade value weighted daily return | 0.000285 | 0.000361 | 0.000119 | 0.000550 *** | 0.000547 * | 0.000422 * | 0.000271 | 0.000182 | 0.000302 |
| | (1.45) | (1.16) | (0.52) | (2.65) | (1.77) | (1.91) | (1.04) | (0.46) | (1.01) |
| Basis points (monthly) | 57 | 72 | 24 | 111 | 110 | 85 | 54 | 36 | 61 |
| Equally weighted daily return | 0.000399 *** | 0.000548 *** | 0.000202 * | 0.000549 *** | 0.000685 *** | 0.000297 *** | 0.000165 * | 0.000171 | 0.000096 |
| | (5.46) | (5.29) | (1.93) | (6.57) | (5.64) | (2.67) | (1.94) | (1.38) | (0.82) |
| Basis points (monthly) | 80 | 110 | 40 | 110 | 138 | 60 | 33 | 34 | 19 |
| Number of daily portfolios | 4,104 | 2,153 | 1,853 | 4,450 | 2,509 | 1,853 | 4,094 | 2,153 | 1,853 |

**Notes:** Tests of significance that are valid at traditional levels of: *10, **5 and ***1 percent; this table shows regression results of returns for portfolios, split by degree of opportunism (routine vs non-routine/opportunistic), that follow the insider trades of CEOs, CFOs and differences between the CFO and CEO portfolio returns using the calendar-time portfolio approach of Barber and Odean (2001) for the period 1992-2009; we adopt the methodology of Cohen *et al.* (2012) to classify executives as either routine or opportunistic with respect to their insider purchases; portfolios based on executives whose trades were classified as non-routine were deemed opportunistic (Panel A); portfolios based on executives trades classified as routine appear in Panel B; model 1 shows results for the CEO portfolio; model 2 shows results for the CFO portfolio; model 3 shows difference portfolios which take a long position in the CFO portfolio and a short position in the CEO portfolio; SOX was implemented on August 29, 2002; we remove the four-month window surrounding SOX to form cleaner portfolios; results are presented for three periods: January 1, 1992 to December 31, 2009 (full period), January 1, 1992 to June 30, 2002 (pre-SOX) and November 1, 2002 to December 31, 2009 (post-SOX); trade value (equal) weights are found by determining all insiders that engaged in purchases during a 50-day trading window and forming weights based on the dollar (equal) contribution to the portfolio; portfolio returns are then created by using weights against the next 50-days of firm level returns; we control for the risk factors using the Carhart (1997) four-factor model, using factors obtained from Ken French's web site; basis points (monthly) are calculated by compounding daily estimates to monthly returns (20 trading days per month); regression coefficients are reported with the associated *t*-statistic appearing in parentheses below the estimate

the sample period of 1992-2009 while the results for the pre-SOX period are insignificant. The routine trades of CEOs and CFOs do not appear to explain the higher returns for CFO trades. Rather, the evidence from this table continues to support the scrutiny hypothesis that the relatively more visible opportunistic CFOs in the post-SOX period revised trading to match more closely that of CEOs' trades.

## 5. Financial acumen hypothesis

The willingness to use asymmetric information appears to drive results for CFO portfolio profitability. However, it could be argued that financial skills might differ among executives. In this section, we test whether skill drives CFO profitability by focusing on the relation between CEOs and CFOs. We separate CEOs who had prior CFO experience from CEOs who did not have such prior experience (as reported in the person's history within the Thomson Financial's Value-Added Insider Data Feed)[9]. In our sample, 651 CEOs had previously held CFO positions, and the remaining 1,599 CEOs had apparently never held a CFO position.

If a CEO has been a CFO, he should still have the skill set of a financial manager. If financial skill rather than information is the impetus behind differences in profitability between CFOs and CEOs, then the trades of the group of CEOs with prior CFO experience should show higher returns. That is, if CFO skills acquired prior to promotion to CEO endowed the CFO with superior trading ability, such skills should remain with the CEO after the role change. Therefore, such CEOs' trades should show the same profitability as those of CFOs unless the CEOs restrain their own trading aggressiveness because of increased scrutiny.

Table VI shows the results of this test. We consider the returns for portfolios that follow the insider purchases of CEOs with and without former experience as CFOs, using the calendar-time portfolio approach of Barber and Odean (2001). In Panel A, our model purchases the portfolio of CEOs with prior experience as CFOs and sells the portfolio of CEOs without prior experience as CFOs. Trade-value weighted excess returns across the full sample period, before and after SOX implementation, indicate no meaningful difference in the returns of CEOs with prior CFO experience and CEOs without such experience. For equally weighted excess returns, the results are similar.

To ensure the accuracy of this test on these subsamples, we ran the test between CFOs as an entire group (with and without subsequent CEO experience) and CEOs who were once CFOs. For consistency with our results in Tables II-V, we expect differences in the pre-SOX period, which we find, with the effect diminishing in the post-SOX period. CFOs appear to have an insider-trading advantage over CEOs arising from their propensity to use asymmetric information and not merely their financial acumen. Thus, the financial acumen hypothesis is not supported.

We did not find support for the financial acumen hypothesis as an alternative to the scrutiny hypothesis as a driver of managerial behavior. The inability to support financial acumen as an explanation does not mean financial executives fail to possess such acumen because CEOs should possess a certain level of financial acumen to assume responsibilities as a firm's lead executive. Thus, we may not be able to detect meaningful differences in skill between CEOs with and those without formal CFO histories. Given nearly 25 percent of our CEOs had CFO experience, this explanation does not seem implausible.

**Dependent variable – daily returns of purchase-based insider trading portfolios**

|  | Panel A: CEOs with CFO experience less CEOs without CFO experience | | | Panel B: CFOs less CEOs with CFO experience | | |
|---|---|---|---|---|---|---|
| Model intercept | 1992-2009 | Pre-SOX | Post-SOX | 1992-2009 | Pre-SOX | Post-SOX |
| Trade value weighted daily return | 0.000273 | −0.000090 | 0.000614 | 0.000065 | 0.000269 | −0.000300 |
|  | (1.05) | (−0.24) | (1.61) | (0.27) | (0.80) | (−1.00) |
| Basis points (monthly) | 55 | −18 | 124 | 13 | 54 | −60 |
| Equally weighted daily return | 0.000037 | 0.000043 | 0.000078 | 0.000259 *** | 0.000420 *** | −0.000050 |
|  | (0.44) | (0.40) | (0.58) | (3.06) | (3.48) | −(0.42) |
| Basis points (monthly) | 7 | 9 | 16 | 52 | 84 | −10 |
| Number of daily portfolios | 4,219 | 2,278 | 1,853 | 4,137 | 2,298 | 1,751 |

**Notes:** Tests of significance that are valid at traditional levels of: *10, **5 and ***1 percent; this table shows regression results of returns for portfolios that consider tests of financial acumen that follow the insider trades of certain CEOs and CFOs using the calendar-time portfolio approach of Barber and Odean (2001) for the period 1992-2009; we consider differenced portfolio returns for (model 1) CEOs with CFO experience and CEOs without CFO experience and differenced returns for (model 2) CFOs and CEOs with CFO experience; SOX was implemented on August 29, 2002; we remove the four-month window surrounding SOX to form cleaner portfolios; results are presented for three periods: January 1, 1992 to December 31, 2009 (full period), January 1, 1992 to June 30, 2002 (pre-SOX) and November 1, 2002 to December 31, 2009 (post-SOX); trade value (equal) weights are found by determining all insiders that engaged in purchases during a 50-day trading window and forming weights based on the dollar (equal) contribution to the portfolio; portfolio returns are then created by using weights against the next 50-days of firm level returns; we control for the risk factors using the Carhart (1997) four-factor model, using factors obtained from Ken French's web site; basis points (monthly) are calculated by compounding daily estimates to monthly returns (20 trading days per month); regression coefficients are reported with the associated t-statistic appearing in parentheses below the estimate

**Table VI.**
Regression analysis for insider trading purchase-based portfolios CEOs with and without CFO experience

## 6. Conclusion

We consider the information content of equity purchase activity for CEOs and CFOs using portfolios formed according to purchase activity. CFO-based trading portfolios yield higher excess returns than CEO-based insider trading portfolios because CFOs appear to exploit information more fully than CEOs, as shown in portfolios based on CFO insider-trading yielding higher abnormal returns. Concerning whether higher returns depend on higher financial acumen of CFOs or whether CEOs have the same skills but simply restrain their own trading aggressiveness because they face higher scrutiny from investors than CFOs do, we find the following. First, CFOs' trade profitability lessened after SOX implementation, when their trades faced more scrutiny. Although the dominance of CFO trading remains after the implementation of SOX, the returns of CFOs' insider-trading portfolios converged with CEO trade returns such that no statistically significant difference between CFO and CEO returns remains. Prior to SOX implementation, CFOs appeared more willing to exploit their asymmetric information advantage than were CEOs. It appears corporate governance strengthened with the implementation of SOX.

Second, we considered tests of scrutiny from two perspectives: insider returns within highly and lightly regulated firms and insider returns within the categories of opportunistic and routine executives. The superiority of CFO returns is strongest before SOX implementation in the more lightly regulated firms and among more opportunistic executives. The evidence is consistent with executives restraining their trading aggressiveness in the face of higher scrutiny by regulators and in their more opportunistic trades. Because SOX placed CFOs in a new position of scrutiny, the evidence indicates the additional scrutiny acted to constrain their trading aggressiveness.

Last, we compare the insider-trading performance of CEOs with CFO experience and that of CEOs without CFO experience to test whether financial acumen drives results. Our evidence does not support financial acumen as a driver of the relation. The results of all our tests indicate that CFO-purchase trade returns outperformed CEO trade returns in the pre-SOX period because they were less visible than CEO trades. While CFOs experienced lower scrutiny, they appeared to trade more aggressively, earning higher abnormal returns. However, since the implementation of SOX, CFOs have become more visible, and their trades are subject to more scrutiny. It appears that CFOs have responded by not trading as aggressively.

## Notes

1. Corporate and Auditing Accountability, Responsibility, and Transparency Act of 2002. Pub. L. No. 107-204, 116 Stat 745. USA.

2. See Executive Compensation Disclosure Rules, 17 C.F.R., Parts 228 and 229 (2006).

3. Prior to the Sarbanes-Oxley reform (August 29, 2002), trades were required to be reported by the tenth day following the close of the month in which the trade took place.

4. We also conducted these tests for 20 trading days (one month). The results for 20 and 50 trading days were similar. For brevity, only the 50 trading day results are used.

5. We require a minimum of ten transactions in a trading window to form the portfolio daily return. When the number of trades falls below ten, the daily risk-free rate is shown.

6. In general, our results from Fama and French's (1993) three-factor model regressions are very similar to our results from the Carhart (1997) four-factor model. For brevity, we do not tabulate the three-factor model results.

7. http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

8. Dollar values are computed by using the CPI factors from the Federal Reserve of St Louis (http://research.stlouisfed.org/fred2/series/CPIAUCSL/).

9. Data limitations prevent us from unequivocally ensuring that CEOs have never been CFOs.

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