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Are CFOs' Trades More Informative Than CEOs' Trades?

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Abstract

We investigate whether trades made by chief financial officers (CFOs) reveal more information about future stock returns than those by chief executive officers (CEOs). We find that CFOs earn statistically and economically higher abnormal returns following their purchases of company shares than CEOs. During 1992–2002, CFOs earned an average 12-month excess return that is 5% higher than that by CEOs. The superior performance by CFOs occurs notwithstanding controls for risk factors and persists even after their trades are publicly disclosed. Further analysis shows that CFO purchases are associated with more positive future earnings surprises than CEO purchases, suggesting that CFOs incorporate better information about future earnings.

I. Introduction

In this paper we investigate whether trades made by chief financial officers (CFOs) contain more information about the firms' future stock performance than those made by chief executive officers (CEOs). We measure the information content in CEOs' and CFOs' stock trades by the abnormal returns cumulated after they purchase or sell company shares.

The most important executive of the corporation is the CEO, who retains overall accountability and responsibility for corporate operations. The CFO is responsible for setting the firm's financial policies including budgeting, investment, financing, risk management, and cost containment. The CFO is also in charge of the financial reporting process, which gives him or her considerable insights into the firm's financial health. Underscoring the importance of these 2 executives, the Sarbanes-Oxley Act of 2002 (SOX) holds the CEO and the CFO responsible for

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the integrity of the firm's financial information and requires that they personally certify financial statements. Traditional studies that examine insider trading behavior either group together all insiders in the firm or focus on top executives as a homogeneous entity (e.g., Jaffe (1974), Finnerty (1976), Seyhun (1986), (1998), Rozeff and Zaman (1988), Lin and Howe (1990), and Jeng, Metrick, and Zeckhauser (2003)). They do not separately examine trades by CEOs and CFOs and whether their trades reveal different information. Such knowledge should help market regulators as well as investors who use insider transactions to assess information.

CFOs may use more inside information in their trades than CEOs. First, it is possible that CFOs possess superior information about the firms than do CEOs. Since CFOs are responsible for the financial strategies of the firms, they could be more intimately acquainted with the financial details than CEOs. CFOs are also in charge of the financial reporting process, a responsibility that allows them to exercise unique influence on reported financial numbers (Jiang, Petroni, and Wang (2010), Geiger and North (2006)). However, such an information advantage might be offset because CFOs, being in a subordinate position, are obligated and perhaps eager to inform CEOs of any private information they possess. Under this view, CEOs' information should dominate that of CFOs (Graham and Harvey (2001)).

Even in the absence of an information advantage by CFOs, their trades could still be more informative than CEOs' because the latter may refrain from using private information in trades. Being the highest profile persons in the corporations, CEOs are more intensely scrutinized by shareholders, regulators, and the public than other insiders. This could make any informed trade more legally risky to CEOs. In addition, CEOs are more highly compensated than CFOs and may have more influence on their compensation structure, which would enable them to derive compensation from less risky avenues. Also, CEOs may acquire stocks for reasons other than profits (e.g., to satisfy the board's ownership guidelines), thus making their trades less informative than those of CFOs. Taken together, we expect CFOs to utilize more private information in their trades than CEOs.

While insiders' information is usually not directly observable, it can be inferred from and measured by their trading performance. While trading by insiders is at times undertaken because of their desire for liquidity and/or to rebalance their portfolios, a significant portion of trades relates to their possessing private information (e.g., Seyhun (1992)). This approach is motivated by models of informed trading in which insiders maximize profits and abnormal profits are related to information asymmetry. In this study, we focus on purchase transactions rather than sales because they allow for more powerful tests: Purchases are more likely to be informed trades, whereas sales may be due to insiders' rebalancing objectives and/or liquidity needs.

Using a comprehensive sample of trades by CEOs and CFOs from Jan. 1992 to July 2002,[1] we find that CFOs earn higher abnormal returns than CEOs in

[1]We end the sample in July 2002 because this is when SOX went into effect and instituted significant changes in the reporting of inside trades. We focus on the pre-SOX period in this study.

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the months following their open market purchases of company shares. The differences are both statistically significant and economically meaningful. Following purchases, CFOs earn an average 12-month size- and book-to-market-adjusted cumulative abnormal return (CAR) that is 5% higher than CEOs. Most of the outperformance by CFOs occurs in the first 9 months, especially the first 3 months after they buy stocks. After their purchases, CFOs on average outperform CEOs by 2.58% in months 1–3, 1.17% in months 4–6, and 1.02% in months 7–9. We also find that CFOs' outperformance concentrates in smaller firms, consistent with Lakonishok and Lee (2001), with CFOs obtaining higher abnormal returns in the smallest 3 size quartiles, but not in the highest size quartile. CAR analysis may suffer from problems of cross-sectional correlations and inflated standard errors (Fama (1998)). To alleviate such concerns, we also use the capital asset pricing model (CAPM), the 3-factor (Fama and French (1993)), and the 4-factor (Carhart (1997)) regression models. We form separate calendar-time portfolios that track returns after CEO and CFO purchases. We find that in the CAPM and factor models, CFOs obtain significantly higher returns than CEOs.

Leland (1992) and Hu and Noe (2001), among others, contend that insider trading causes private information to be quickly reflected in prices. This happens because, when insiders trade, a signal is sent to the market when these trades are disclosed, thereby leading to a change in demand for the shares. We therefore test whether CFOs' superior abnormal returns could still be earned after the filing date when their trades are publicly disclosed.[2] Surprisingly, we still find statistically and economically significant outperformance by CFOs over CEOs. In a 12-month period measured after the filing date, CFOs outperform CEOs by 4.62% in purchases. Again, most of the outperformance occurs in the first 9 months and especially in the first 3 months of the cumulation period.

Next we examine whether the abnormal returns obtained by these insiders are driven by the use of information about future earnings (e.g., Ke, Huddart, and Petroni (2003), Piotroski and Roulstone (2005)). If insiders use private information about future earnings, their trades should predict future earnings innovations, that is, earnings changes that have not been anticipated by the market (earnings surprise) and thus not impounded in price. We measure earnings innovations by the 3-day CARs around quarterly earnings announcements (EAs). We find that compared with CEO purchases, CFO purchases are followed by more positive earnings innovations, suggesting that CFOs incorporate better information about future earnings in their purchases.[3]

Our primary contribution to the insider trading literature is that we show that trades by different corporate executives reveal different private information and that CFOs' trades are more informative than those of CEOs. Extant literature

[2]Prior to SOX of 2002, insiders had to publicly disclose their trades by the 10th day of the following month. For example, both trades that took place on Mar. 1 and Mar. 31 would be filed with the Securities and Exchange Commission (SEC) by Apr. 10. The reporting lag could be as long as 40 days. Since SOX, insiders must disclose their trades within 2 days of the transactions.

[3]It should be noted, though, that the magnitude of CARs around EA is small relative to the CARs cumulated over the 6-month period after CFO purchases. This suggests that private information about future earnings does not fully explain the abnormal trading profits obtained by CFOs.

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has mostly treated corporate insiders as a uniform group.[4] In light of the recent regulatory focus on both CEOs and CFOs as the key players in corporate governance, we provide evidence that the difference in abnormal trading performance between CEOs and CFOs is economically meaningful. We also contribute to the literature by relating CFOs' superior trading performance to information about firms' future earnings. Beneish and Vargus (2002) find that trades made by top executives predict earnings quality. Our results suggest that CFOs' purchases are better predictors of future earnings innovations than CEOs'.

The rest of the paper is organized as follows: Section II describes the data and summary statistics. Section III presents empirical results. Section IV examines the sources of private information of CEOs and CFOs. Section V summarizes and concludes.

II. Data Description and Summary Statistics

Our sample covers the period Jan. 1992–July 2002, before SOX's provisions concerning insider trades went into effect on July 30, 2002. Insider trading data are obtained from Thomson Financial. The data set includes all open market purchases and sales made by CEOs and CFOs. It also includes the date of the transaction, the price paid or received for each share purchased or sold, the size of the transactions, and the SEC filing date. Following Lakonishok and Lee (2001), we exclude transactions in which the trading stock price is below \$2 to avoid unnecessary noise in estimating returns (Conrad and Kaul (1993)). We also require that a stock is traded for at least 25 trading days during each 3-month period after the transaction date. Our results, however, are not sensitive to these restrictions on trading price and minimum number of trading days. We obtain company financial data from Compustat and stock return data from the Center for Research in Security Prices (CRSP).

Table 1 provides an accounting of the number of CEO and CFO transactions we use in the analysis. Thomson Financial recorded 171,388 instances of open market transactions by CEOs and CFOs from Jan. 1992 to July 2002. In our final sample, we have 58,421 observations, of which 12,936 and 7,049 purchases are made by CEOs and CFOs, respectively, and 24,527 and 13,909 sales are made by CEOs and CFOs, respectively. The loss of observations is due to eliminating low price stocks (less than \$2 per share), less frequently traded stocks (traded on fewer than 25 days per quarter), foreign registrants, stocks with insufficient market data from CRSP, and stocks that lack the required size and book-to-market data for assignment to 10×10 portfolios. But the biggest reduction in sample size (a reduction of 70,923 or more than 40% of the original number of observations) is due to the fact that we treat multiple trades by the same insider on the same day as 1 transaction. Insiders often execute more than 1 trade on the same day. We assume these trades are motivated by the same information and therefore combine these trades into a single data point. As a sensitivity test, we conduct our analyses

[4]Seyhun (1998) and Jeng et al. (2003) discuss subgroups of insiders and provide evidence of officers possessing better information than other insiders (e.g., large shareholders). However, they do not specifically compare CEOs with CFOs.

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TABLE 1
Sample Selection

Table 1 describes the sampling procedure and reports the number of insider trades in our sample.

Sample Selection	CEO Purchases	CEO Sales	CFO Purchases	CFO Sales	Total No. of Obs.
Thomson Financial Insider Trading Database (Jan. 1992–July 2002) open market transactions	48,904	73,226	18,556	30,702	171,388
Less: Trading price of stock less than $2/share	(10,231)	(4,849)	(2,943)	(885)	(18,908)
Less: Combining multiple same-day transactions by the same insider into a single observation	(18,756)	(35,428)	(4,896)	(11,843)	(70,923)
Less: Trades in foreign firms	(242)	(419)	(126)	(205)	(992)
Less: Stocks with insufficient market data data (CRSP), or size and book-to-market data to assign to 10 × 10 portfolios, stocks traded in fewer than 25 days in a quarter after insider transactions	(6,739)	(8,003)	(3,542)	(3,860)	(22,144)
Final sample	12,936	24,527	7,049	13,909	58,421

by treating same-day trades as distinctive ones. We obtain much larger CARs for both insiders and much larger differences between CEOs and CFOs.[5]

We examine insider purchases and sales separately in this study instead of using net sales (total sales minus total purchases), as is often done in other studies. Treating purchases and sales separately is preferable for two reasons. First, we are interested in determining the extent to which purchases and sales by CEOs and CFOs contain different amounts of private information. Second, and more important, insiders' sales are often driven by liquidity needs. Increasingly, managers' compensation packages are comprised of equity-based compensation such as options and restricted shares, and it is expected that some or all of these shares will be converted to cash, depending on the insiders' liquidity needs. Sales such as these will weaken the predictive power of insider trades and therefore weaken our ability to ascertain the amount of private information contained in these trades. In contrast, insider purchases are usually not motivated by liquidity needs and are more likely to be information based. Therefore, focusing on purchases will increase the power of our tests.

Table 2 provides summary statistics of CEO and CFO transactions in Panel A and characteristics of firms that have either CEO or CFO trades in Panel B. Not surprisingly, most insider transactions are sales rather than purchases. Sales also dominate purchases both in dollar terms and as a percentage of the firm's market capitalization. Since top executives are compensated by options and restricted shares, they need to be net sellers of company stocks over time. CEO transactions are much larger than CFO transactions, which is not surprising, either, since CEOs are usually better compensated and have more wealth than CFOs. The median

[5]It is possible that trades by the same insider that take place within days of each other are also based on the same information. To allow for that possibility, we conduct sensitivity tests by grouping trades that take place within 3, 5, 7, or 10 days of each other into a single transaction. We obtain very similar results.

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TABLE 2

Descriptive Statistics

Table 2 presents descriptive statistics. Panel A reports descriptive statistics of insider trades, as sorted by position (CEO and CFO). All market values and shares outstanding used as scalars are as of the beginning of the calendar year when an insider trade takes place. Panel B reports descriptive statistics of firm-year observations between 1992 and 2002 that have insider trading activities. The market value of the firm is measured at the beginning of the fiscal year. Book-to-market ratio is calculated as book value of equity divided by market value of equity, both measured at the beginning of the fiscal year. CEO (CFO) in Panel B refers to the firms whose CEO (CFO) traded in the year.

Variables	Insiders	*N*	Mean	SD	25%	Median	75%
Panel A. Insider Trades by Position							
Insider purchase amount ($)	CEO	12,936	183,084	4,075,846	5,500	18,250	62,500
	CFO	7,049	44,610	310,213	3,500	10,000	26,820
	All	19,985	134,272	3,285,524	4,649	14,277	46,500
Insider purchase amount ($) scaled by market capitalization	CEO	12,936	0.00083	0.00983	0.00004	0.00015	0.00044
	CFO	7,049	0.00025	0.00256	0.00002	0.00006	0.00020
	All	19,985	0.00063	0.00806	0.00003	0.00011	0.00034
Insider sales amount ($)	CEO	24,527	1,326,451	9,757,793	63,000	220,140	738,150
	CFO	13,909	405,958	1,215,337	39,000	127,200	359,190
	All	38,436	994,079	7,846,161	51,480	180,000	566,000
Insider sales amount ($) scaled by market capitalization	CEO	24,527	0.00147	0.00929	0.00009	0.00030	0.00091
	CFO	13,909	0.00054	0.00371	0.00006	0.00018	0.00047
	All	38,436	0.00114	0.00777	0.00008	0.00025	0.00071
Panel B. Firm-Year Descriptive Statistics							
Market value of firm (in millions $)	CEO	9,308	1,645.8	4,446.9	96.0	315.0	1,042.2
	CFO	8,855	1,726.5	4,474.0	107.6	349.6	1,161.1
	All	13,438	1,627.0	4,364.0	94.8	310.7	1,046.5
Book-to-market ratio	CEO	9,308	0.560	0.4479	0.249	0.446	0.725
	CFO	8,855	0.534	0.413	0.244	0.432	0.694
	All	13,438	0.556	0.431	0.255	0.450	0.717

market value of the firm is $310.7 million. So, the typical firm in our sample is a small cap firm.

III. Empirical Results

If insiders use private information in their trades, they should earn abnormal returns. In this section, we first provide evidence on CARs earned following CEO and CFO trades. Next, we measure abnormal returns in factor model regressions. Finally, we examine abnormal returns after insider trades are publicly disclosed to assess how quickly information in insider trades is incorporated in price.

A. CARs of CEO and CFO Trades

We measure insider trading performance by calculating CARs of a stock earned during the 12-month period after an insider trade takes place. CARs are calculated by taking the daily return of a stock, subtracting the corresponding benchmark portfolio return to control for risk factors (Fama and French (1992)), and adding these daily excess returns over time. Traditionally, both value-weighted (VW) and equal-weighted (EW) benchmark portfolios have been used. However, neither is suitable for our purpose.

Literature starting with Blume and Stambaugh (1983) has pointed out that microstructure noises in security prices lead to bias in measured stock returns. Blume and Stambaugh show that zero-mean noises due to bid-ask bounce induce

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upward bias in returns computed from quoted closing prices. Other microstructure noises, such as nonsynchronous trading, noisy trades by uninformed traders, rounding of prices to a discrete pricing grid, and "price pressure" from large orders, also lead to upward bias in computed returns (Asparouhova, Bessembinder, and Kalcheva (2010a)). Return for an EW portfolio is thus also biased by the average bias in the individual returns. In contrast, VW portfolio returns are not subject to the noise-induced upward bias (Asparouhova, Bessembinder, and Kalcheva (2010b)). However, the VW mean return is dominated by a few large stocks and is not a suitable benchmark for our sample, which contains many small firms. In addition, we are interested in measuring the average information content of insider trades, which is inherently an EW measure.[6]

To eliminate the bias in EW portfolio returns, we use a simple correction procedure proposed in Asparouhova et al. (2010a) whereby each observed return in a portfolio is weighted by the gross (1+) return on the same security in the prior period. The correction produces an EW benchmark that is not biased. To distinguish between a traditional EW portfolio return and the return obtained using such a correction, we will refer to the latter as a return-weighted (RW) portfolio return in the remainder of the paper.

To construct benchmark portfolios, we first assign stocks to 10×10 daily portfolios based on size and book-to-market ratios. Consistent with Fama and French (1992), we use NYSE size and book-to-market decile break points to categorize stocks. As a result, we have many more firms in size decile 1 than in the other deciles, because non-NYSE firms are typically smaller than NYSE firms. We drop firms that lack the necessary data to determine their size and/or book-to-market portfolios. The portfolio return is computed using the weighting procedure described above whereby each return is weighted by the gross (1+) return of the same security in the prior trading day.

Since abnormal return is calculated as the difference between the daily stock return and the return of the benchmark portfolio, we also correct for bias in the individual stock return. The correction procedure is similar to the one applied to the benchmark portfolio return. Specifically, we multiply the stock return by its prior day gross return and divide it by the average prior day gross return of the stocks in the same size and book-to-market portfolio.

We separate purchases from sales and CEO trades from CFO trades and cumulate abnormal returns over 12 months after insider trades. Using a 12-month window is appropriate because insiders typically hold their positions for longer terms; security laws would force them to return any short-term (within 6 months) "round-trip" profits. Our sample is equivalent to forming "mimicking" portfolios that add a position (long or short) in a stock when an insider (CEO or CFO) trades (purchases or sells). We also break down the 12-month window into four 3-month periods and calculate CARs for each period (i.e., months 1–3, 4–6,

[6]Using VW benchmarks also produces implausibly high abnormal returns in our sample because VW market returns are much lower than EW market returns during our sample period. For example, the average 12-month CAR benchmarked against the Fama and French (1993) VW size and book-to-market portfolios (10×10) is 16.46% (11.98%) for the CFOs (CEOs) after they purchase company stocks.

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7–9, and 10–12 subsequent to an insider trade). Breaking down the measurement window into smaller periods allows us to ascertain when the abnormal returns occur and how quickly insiders' information is impounded into prices.

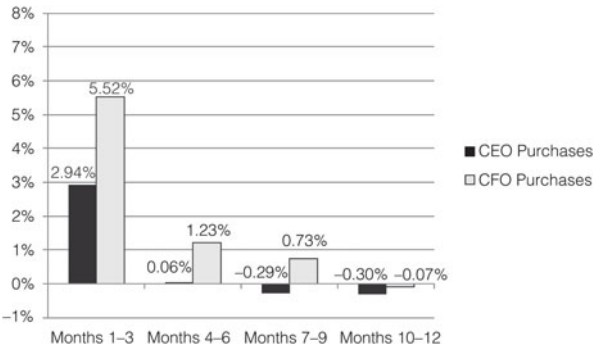
Figure 1 shows the average abnormal returns obtained by insiders during the 12 months after they purchase stocks. Graph A shows CARs obtained by CEOs and CFOs during months 1–3, 4–6, 7–9, and 10–12, respectively. Graph B shows the cumulative difference in returns between CEOs and CFOs over the 3-, 6-, 9-, and 12-month windows.

FIGURE 1

Abnormal Returns after Insider Purchases (CEO vs. CFO)

Figure 1 shows the cumulative abnormal returns (CARs) for up to 12 months for insiders (CEOs and CFOs) after they purchase stocks between Jan. 1992 and July 2002. Graph A shows mean CARs over successive 3-month windows. Graph B shows CARs cumulated over 3-, 6-, 9-, and 12-month windows as well as the difference between CEO and CFO returns. CAR is calculated as the difference between the return of the individual stock and the return of the benchmark size and book-to-market decile portfolio (10 × 10), cumulated over the measurement window. All stock returns in the portfolios are adjusted by a weighting procedure whereby each observed return is weighted by the gross (1+) return of the same security on day $t - 1$ (Asparouhova et al. (2010a)).

Graph A. Abnormal Returns over 3-Month Windows



Graph B. Cumulative Difference between CEO and CFO Performances

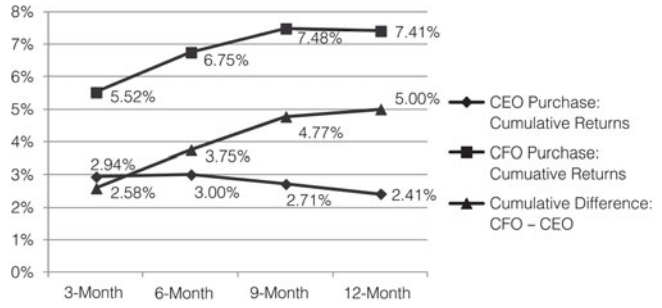


Table 3 presents post-trade stock performance. Panel A gives the results for purchases. We find that combined CEO and CFO purchases are followed by a significantly positive 12-month CAR of 4.17%. The magnitude of the abnormal returns is comparable to that found in prior literature.[7] Most of the returns

[7]For example, Lakonishok and Lee (2001) report a 12-month CAR of 3.5% in their highest net purchase ratio (NPR) portfolio (Table 6) for 1975–1995. Our results are not directly comparable to

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concentrate in the first 3 months after insider purchases. In fact, during months 10–12, insiders appear to earn negative abnormal returns, although the magnitude of the returns is small and not statistically significant.

TABLE 3

Abnormal Returns after Insider Trades (CEO vs. CFO)

Table 3 reports mean cumulative abnormal returns (CARs) for insiders (CEOs and CFOs) after they purchase or sell stocks between Jan. 1992 and July 2002. Panel A reports CARs after insider purchases and Panel B reports CARs after insider sales. CAR is calculated as the difference between the return of the individual stock and the return of the benchmark size and book-to-market decile portfolio (10 × 10), cumulated over the measurement window. All stock returns in the portfolios are adjusted by a weighting procedure whereby each observed return is weighted by the gross (1+) return of the same security on day $t - 1$ (Asparouhova et al. (2010a)). * and ** indicate significance at the 5% and 1% levels, respectively.

		Average CARs over:				
Insiders	No. of Trades	Months 1–3	Months 4–6	Months 7–9	Months 10–12	Sum
Panel A. After Insider Purchases						
Combined	19,985	3.85%**	0.47%*	0.07%	−0.22%	4.17%**
CEO	12,936	2.94%**	0.06%	−0.29%	−0.30%	2.41%**
CFO	7,049	5.52%**	1.23%**	0.73%*	−0.07%	7.41%**
CFO – CEO		2.58%**	1.17%**	1.02%*	0.23%	5.00%**
Cumulative diff.		2.58%**	3.75%**	4.77%**	5.00%**	
Panel B. After Insider Sales						
Combined	38,436	−2.06%**	0.15%	0.07%	−0.71%**	−2.55%**
CEO	24,527	−2.09%**	0.50%*	0.17%	−0.80%**	−2.22%**
CFO	13,909	−2.00%**	−0.46%	−0.12%	−0.56%*	−3.14%**
CFO – CEO		0.09%	−0.96%**	−0.29%	0.24%	−0.92%**
Cumulative diff.		0.09%	−0.87%**	−1.16%**	−0.92%**	

When we separate the sample by CEOs and CFOs, we find that following their purchases CFOs earn a 12-month CAR of 7.41% compared to CEOs, who earn only 2.41%. The difference in these returns is 5.00 percentage points, which is economically large and statistically significant. Most of the outperformance by CFOs occurs in the first 9 months, especially the first 3 months. CFOs earn an average CAR of 5.52% during the first 3 months after they purchase stock while CEOs earn 2.94%, a difference of 2.58 percentage points. During months 4–6, CFOs earn average CAR of 1.23% while CEOs earn 0.06%, a difference of 1.17 percentage points. The CEO return during months 4–6 is not significantly different from 0. CFOs' outperformance continues but tapers off in months 7–9. In months 10–12, the difference between CFO and CEO excess returns is not statistically significant.

For completeness, we also report abnormal returns after insider sales in Panel B of Table 3. Note that negative (positive) returns after sales represent losses avoided (borne) by insiders. Twelve months after insiders sales, CFOs and CEOs as a combined group avoided a negative abnormal return of –2.55%. While these returns are statistically significant, they are economically smaller than the profits earned after purchases, suggesting that insider sales are less informative than insider purchases. Separately, CEOs avoided a total 12-month loss of –2.22%,

theirs because of the differences in sample and research design. In addition, they use an EW measure of CAR without correcting for bias in either the portfolio or the individual returns.

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while CFOs avoided a loss of –3.14%.[8] During the 12-month period, CFO sales outperform CEO sales by 0.92%, a difference that is statistically significant but perhaps economically small.

Lakonishok and Lee (2001) find that abnormal profits by insiders concentrate in smaller firms. To examine whether there is a size effect in insider returns, we report 12-month CARs by different size categories in Table 4. We first sort our sample into size quartiles and compare CARs from CEO and CFO trades in each quartile. After purchases, CFOs outperform CEOs in the lowest 3 size quartiles by significant margins of 5.83%, 6.06%, and 5.48%, respectively, for the size quartiles 1, 2, and 3. However, CEOs appear to outperform CFOs in the largest size quartile, although the difference of 1.27% is not statistically significant. After sales, CFOs outperform CEOs in the smallest size quartile. However, CEOs outperform CFOs in the largest size quartile. There is no difference between CEO and CFO abnormal returns in the middle quartiles.

TABLE 4

Abnormal Returns by Firm Size after Insider Trades

Table 4 reports mean 12-month cumulative abnormal returns (CARs) for insiders (CEOs and CFOs) by different firm size portfolios after they trade stocks between Jan. 1992 and July 2002. Portfolios are formed by sorting the sample into size quartiles each year. CARs for CEO and CFO trades that belong to the same size quartiles are then compared. CAR is calculated as the difference between the return of the individual stock and the return of the benchmark size and book-to-market decile portfolio (10 × 10), cumulated over the measurement window. All stock returns in the portfolios are adjusted by a weighting procedure whereby each observed return is weighted by the gross (1+) return of the same security on day $t - 1$ (Asparouhova et al. (2010a)). * and ** indicate significance at the 5% and 1% levels, respectively.

	12-Month CARs of:			
Insiders	Size Quartile 1	Size Quartile 2	Size Quartile 3	Size Quartile 4
Panel A. Purchases				
CEO	2.36%*	2.89%**	1.71%	4.92%**
CFO	8.19%**	8.95%**	7.19%**	3.65%**
CFO – CEO	5.83%**	6.06%**	5.48%**	−1.27%
Panel B. Sales				
CEO	−2.72%**	1.41%	−2.77%**	−4.98%**
CFO	−7.95%**	−0.10%	−3.10%**	−1.83%*
CFO – CEO	−5.23%**	−1.51%	−0.33%	3.15%**

B. Measuring Abnormal Returns Using Factor Models

CAR analysis may suffer from problems of cross-sectional correlations and inflated standard errors (Fama (1998)). To alleviate these concerns, we also estimate abnormal performance using calendar-time portfolios. All stocks are placed in a portfolio in the month following insider trades (purchase or sale) and are held for exactly 6 months. Since insiders are required to hold the position for at least 6 months after a trade (or return the round-trip profit), we use a ½-year window. The first 6 months also capture most of the insider excess returns. We also report results using a 1-year window with qualitatively similar results. We construct 4 separate portfolios for CEOs and CFOs, and sales and purchases, respectively.

[8]However, we do not find abnormal returns for insider sales in the factor model analyses explained in Section III.B.

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The returns on these portfolios are regressed on the risk factors, namely the market factor (MRK_RF), the size factor (SMB), the book-to-market factor (HML), and the momentum factor (MOM). To correct the bias in returns caused by microstructure noises, we apply the RW procedure used in Asparouhova et al. (2010a). Specifically, we compute the weighted mean return of the portfolios, using the gross (1+) prior period return as the weighting variable.

Panel A of Table 5 contains the results of the 6- and 12-month RW purchase portfolios, and Panel B contains those of the sales portfolios. We focus on the 6-month results. Columns 1–3 contain the results of the basic CAPM, columns 4–6 contain the results of the 3-factor model (MRK_RF, SMB, and HML), and columns 7–9 contain the results of the 4-factor model with the additional momentum factor (MOM). The results of the standard CAPM show that both CEOs and CFOs earn abnormal returns when we control for market risk. This is revealed by the intercept estimate being positive and significant. To be specific, we find that CEOs earn a monthly abnormal return of 0.89% and CFOs earn a monthly abnormal return of 1.43%. Column 3 contains the results where differences in the monthly returns between CFO and CEO portfolios are regressed on the market premium. These results are equivalent to performance of portfolios in which long positions are taken for CFO trades and short positions are taken for CEO trades. The results show that the difference in monthly abnormal returns between CFOs and CEOs is 0.54 percentage points, which is statistically significant. The results of the 3-factor model are consistent with those obtained from the standard CAPM. They show that even when we control for financial distress (SMB) and growth opportunities (HML), CFOs (CEOs) still earn an abnormal monthly return of 1.25% (0.65%). The difference between CFO and CEO returns is significant, with CFOs outperforming CEOs by 0.60 percentage points per month. These abnormal returns are comparable with those reported in Table 3. The abnormal monthly return of 1.25% (0.65%) for CFO (CEO) is equivalent to 7.5% (3.9%) for a 6-month period, compared with a 6-month average CAR of 6.75% (3.0%) for CFOs (CEOs) reported in Table 3.[9] There is no significant difference between CFO and CEO portfolios on the risk factors, suggesting that the 2 groups of insiders are taking similar risks and that the outperformance by CFOs is not a result of more risk taking. The 4-factor model results are similar, with the CFO portfolio outperforming the CEO portfolio by 0.53 percentage points on a monthly basis.

The results for the RW sales portfolios are presented in Panel B of Table 5. We focus again on the 6-month portfolios. For the standard CAPM, the 3-factor model, and the 4-factor model, we find that neither the CEO nor the CFO portfolio earns abnormal returns following sales. In addition, there are no significant differences between CEO and CFO returns. The coefficients on the risk factors are similar for CEO and CFO portfolios, with no significant difference in risk taking. These results suggest that the abnormal returns obtained following sales for both CEOs and CFOs represent nothing more than compensation for risk. It appears

[9]The abnormal returns from the calendar-time portfolios still tend to be somewhat higher than those reported in Table 3. This is probably due to the fact that the Fama and French (1993) market factor is value weighted and using a VW benchmark overstates excess returns for our sample.

that the abnormal returns in insider sales shown in Table 3 are not robust to factor model estimations.

C. Insider Trading and Informational Efficiency

One of the key issues regarding insider trading is whether it hurts or helps the integrity of financial markets. Those against allowing insider trading contend that it is harmful to investors and undermines the fairness of capital markets. Proponents (e.g., Manne (1966)), on the other hand, argue that one of the benefits of insider trading is that it facilitates the incorporation of information possessed by insiders into stock prices. In this subsection, we explore the issue by examining

TABLE 5

Fama-French Regressions

Table 5 reports coefficients and *t*-statistics (in parentheses) of the CAPM, 3-factor (Fama and French (1993)), and 4-factor (Carhart (1997)) regression models. The dependent variable is the monthly portfolio returns minus the risk-free returns from Jan. 1993 to July 2002 (121 observations for 6-month returns and 115 observations for 12-month returns). The portfolio returns are measured on a return-weighted basis whereby each observed return in the portfolio is weighted by the gross (1+) return of the same security in month $t - 1$. The independent variables are: MRK_RF, SMB, and HML (Fama and French (1993)) and a momentum factor (MOM). The factors are obtained from Kenneth French's Web site (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/). The portfolios are constructed as follows: In Panel A, CEO (CFO) Purchase Portfolio includes all stocks that had at least 1 CEO (CFO) purchase transaction made during the previous 6- and 12-month periods, respectively. In Panel B, CEO (CFO) Sales Portfolio includes all stocks that had at least 1 CEO (CFO) sale transaction made during the previous 6- and 12-month periods, respectively. CFO – CEO is the difference in returns between the CFO and CEO monthly portfolios. It is equivalent to taking opposite long/short positions of the CFO/CEO portfolios. * and ** indicate significance at the 5% and 1% levels, respectively.

Panel A. Return-Weighted Purchase Portfolios

	Dependent Variable: Purchase Portfolio Returns								
	CAPM			3-Factor			4-Factor		
Independent Variables	CEO Purchase Portfolio	CFO Purchase Portfolio	CFO – CEO	CEO Purchase Portfolio	CFO Purchase Portfolio	CFO – CEO	CEO Purchase Portfolio	CFO Purchase Portfolio	CFO – CEO
6-Month Returns									
Intercept	0.0089** (2.47)	0.0143** (4.08)	0.0054** (2.49)	0.0065* (2.25)	0.0125** (5.21)	0.0060** (2.72)	0.0115** (4.70)	0.0169** (8.46)	0.0053** (2.33)
MRK_RF	0.8193** (10.03)	0.8696** (10.90)	0.0503 (1.02)	0.8530** (10.99)	0.8443** (13.08)	–0.0087 (–0.15)	0.7694** (11.90)	0.7716** (14.69)	0.0022 (0.04)
SMB				0.6846** (8.67)	0.7611** (11.59)	0.0765 (1.27)	0.7652** (11.66)	0.8312** (15.59)	0.0660 (1.08)
HML				0.3062** (3.09)	0.2169** (2.63)	–0.0893 (–1.18)	0.2554** (3.13)	0.1727* (2.60)	–0.0827 (–1.09)
MOM							–0.3505** (–7.60)	–0.3047** (–8.13)	0.0459 (1.07)
Adj. R^2	0.454	0.495	0.000	0.668	0.778	0.037	0.777	0.857	0.038
12-Month Returns									
Intercept	0.0064* (1.90)	0.0102** (3.14)	0.0038* (2.27)	0.0035 (1.43)	0.0075** (3.84)	0.0040** (2.35)	0.0077** (3.70)	0.0112** (7.12)	0.0035* (1.97)
MRK_RF	0.7881** (10.50)	0.8767** (12.06)	0.0887* (2.35)	0.8767** (13.41)	0.9386** (17.98)	0.0618 (1.35)	0.8048** (14.84)	0.8756** (21.36)	0.0709 (1.53)
SMB				0.6993** (10.57)	0.7681** (14.54)	0.0687 (1.49)	0.7638** (13.97)	0.8244** (19.94)	0.0607 (1.30)
HML				0.4110** (4.92)	0.3821** (5.73)	–0.0289 (–0.49)	0.3644** (5.33)	0.3414** (6.60)	–0.0230 (–0.39)
MOM							–0.2884** (–7.52)	–0.2522** (–8.70)	0.0362 (1.10)
Adj. R^2	0.489	0.559	0.038	0.742	0.849	0.060	0.828	0.910	0.062

(continued on next page)

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TABLE 5 (continued)
Fama-French Regressions

Panel B. Return-Weighted Sales Portfolios

	Dependent Variable: Sales Portfolio Returns								
	CAPM			3-Factor			4-Factor		
Independent Variables	CEO Sales Portfolio	CFO Sales Portfolio	CFO – CEO	CEO Sales Portfolio	CFO Sales Portfolio	CFO – CEO	CEO Sales Portfolio	CFO Sales Portfolio	CFO – CEO
6-Month Returns									
Intercept	–0.0016 (–0.35)	–0.0041 (–0.95)	–0.0025 (–1.12)	0.0000 (0.00)	–0.0022 (–1.27)	–0.0022 (–0.96)	0.0006 (0.20)	–0.0022 (–1.22)	–0.0028 (–1.15)
MRK_RF	1.5009** (14.71)	1.4486** (14.71)	–0.0526 (–1.02)	1.2116** (16.69)	1.1238** (23.72)	–0.0878 (–1.39)	1.2023** (16.29)	1.1238** (23.28)	–0.0785 (–1.23)
SMB				0.8019** (10.86)	0.8597** (17.85)	0.0579 (0.90)	0.8108** (10.82)	0.8597** (17.54)	0.0489 (0.75)
HML				–0.2878** (–3.10)	–0.3368** (–5.57)	–0.0490 (–0.61)	–0.2935** (–3.15)	–0.3368** (–5.52)	–0.0433 (–0.54)
MOM							–0.0391 (–0.74)	–0.0000 (–0.00)	0.0391 (0.86)
Adj. R^2	0.642	0.642	0.000	0.878	0.944	0.005	0.877	0.944	0.002
12-Month Returns									
Intercept	–0.0036 (–0.84)	–0.0050 (–1.23)	–0.0014 (–0.80)	–0.0019 (–0.76)	–0.0030 (–1.59)	–0.0011 (–0.61)	0.0003 (0.11)	–0.0013 (–0.69)	–0.0016 (–0.85)
MRK_RF	1.5373** (15.99)	1.4681** (15.99)	–0.0693 (–1.76)	1.2819** (18.73)	1.1877** (23.32)	–0.0942 (–1.95)	1.2436** (18.64)	1.1579** (23.43)	–0.0858 (–1.74)
SMB				0.7482** (10.81)	0.7617** (14.78)	0.0135 (0.28)	0.7825** (11.63)	0.7884** (15.82)	0.0060 (0.12)
HML				–0.2426** (–2.78)	–0.2866** (–4.41)	–0.0440 (–0.71)	–0.2674** (–3.18)	–0.3059** (–4.91)	–0.0385 (–0.62)
MOM							–0.1535** (–3.25)	–0.1200** (–3.42)	0.0339 (0.98)
Adj. R^2	0.691	0.691	0.018	0.896	0.937	0.011	0.904	0.942	0.010

CEOs' and CFOs' abnormal stock returns subsequent to the public disclosure of their trading in the SEC filings. If the proponents are correct, then following insider purchases (sales), we should see a quick increase (decrease) in stock prices due to the rapid incorporation of private information. This implies that the significant abnormal performance following the buying of shares by CEOs and CFOs should at a minimum be substantially reduced, if it exists at all. It would also provide evidence on the importance, or lack thereof, of the new SOX requirement that insider trades must be filed within 2 days following the transactions.

Figure 2 illustrates the abnormal returns after insider purchases are publicly filed. Graph A shows CARs after insider filings during months 1–3, 4–6, 7–9, and 10–12, respectively. Graph B shows the cumulative difference in returns between CEOs and CFOs over the 3-, 6-, 9-, and 12-month windows. Compared with Figure 1 (Graph A), these returns exhibit similar patterns, although the magnitude of the returns cumulated after the filing days is usually smaller than that of those cumulated after the trading days.

Table 6 reports the abnormal returns for CEOs and CFOs cumulated after their trades were filed with the SEC and therefore made public. We start cumulating abnormal returns on the 2nd day after the filing day to allow for the possibility that the filings take place after the market closes. In other words, we

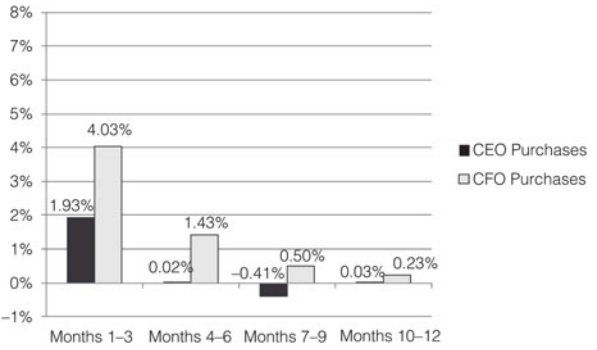
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FIGURE 2

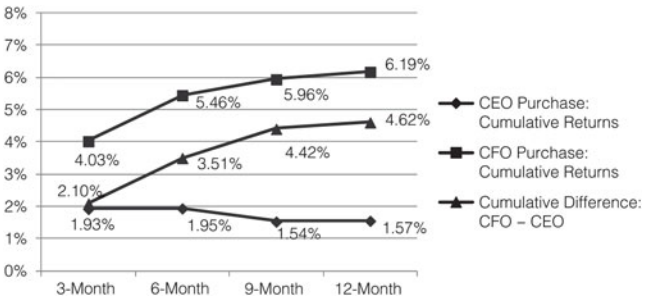
Abnormal Returns after Public Disclosures of Insider Purchases (CEO vs. CFO)

Figure 2 shows mean cumulative abnormal returns (CARs) for insiders (CEOs and CFOs) cumulated from the 2nd day (T + 2) after the filing day (T) of insider purchases. Filing days are when insiders publicly disclose their trades via SEC filings. Graph A shows mean CARs over successive 3-month windows. Graph B shows CARs cumulated over 3-, 6-, 9-, and 12-month windows as well as the difference between CEO and CFO returns. CAR is calculated as the difference between the return of the individual stock and the return of the benchmark size and book-to-market decile portfolio (10 × 10), cumulated over the measurement window. All stock returns in the portfolios are adjusted by a weighting procedure whereby each observed return is weighted by the gross (1+) return of the same security on day $t - 1$ (Asparouhova et al. (2010a)).

Graph A. Abnormal Returns after Filing Day over 3-Month Windows



Graph B. Cumulative Difference between CEO and CFO Performances



start cumulating returns on day T + 2, with day T being the filing day. The 12-month cumulative size- and book-to-market-adjusted returns (CARs) following purchases are 6.19% for CFOs and 1.57% for CEOs, a difference of 4.62 percentage points. Comparing these results with those in Table 3, we find that while the returns for CFOs are smaller (6.19% vs. 7.41%) if cumulated after the filing day, they are still economically significant. The difference between CEO and CFO returns, though slightly lower than in Table 3 (4.62% vs. 5.00%), is still substantial. The abnormal returns after CEO purchase filings seem muted. Thus, it appears that investors do not react particularly quickly to trades by CFOs. We also report CARs obtained during months 1–3, 4–6, 7–9, and 10–12. Most of the abnormal returns for CFOs occur in the first 6 months, especially the first 3 months after the filing day window. CFOs earn a CAR of 4.03% in the first 3 months after filing day and 1.43% in months 4–6. CEOs only earn a return of 1.93% in the first 3 months after filing day. They earn slightly negative abnormal returns in the next 9 months, although those returns are very small and statistically insignificant.

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Also similar to the results in Table 3, most of the outperformance by CFOs is obtained during the first 9 months. The cumulative 9-month outperformance by CFOs is 4.42%.

TABLE 6

Abnormal Returns after Public Disclosures of Insider Trades (CEO vs. CFO)

Table 6 reports mean cumulative abnormal returns (CARs) for insiders (CEOs and CFOs) cumulated from the 2nd day ($T + 2$) after the filing day (T) of insider trades between Jan. 1992 and July 2002. Filing days are when insiders publicly disclose their trades via SEC filings. Panel A reports CARs after purchase filings, and Panel B reports CARs after sales filings. CAR is calculated as the difference between the return of the individual stock and the return of the benchmark size and book-to-market decile portfolio (10 × 10), cumulated over the measurement window. All stock returns in the portfolios are adjusted by a weighting procedure whereby each observed return is weighted by the gross (1+) return of the same security on day $t - 1$ (Asparouhova et al. (2010a)). * and ** indicate significance at the 5% and 1% levels, respectively.

		Average CARs over:				
Insiders	No. of Trades	Months 1–3	Months 4–6	Months 7–9	Months 10–12	Sum
Panel A. Abnormal Returns after Public Disclosures of Insider Purchases						
Combined	19,985	2.67%**	0.52%*	−0.09%	0.10%	3.19%**
CEO	12,936	1.93%**	0.02%	−0.41%	0.03%	1.57%**
CFO	7,049	4.03%**	1.43%**	0.50%	0.23%	6.19%**
CFO – CEO		2.10%**	1.41%**	0.91%*	0.20%	4.62%**
Cumulative diff.		2.10%**	3.51%**	4.42%**	4.62%**	
Panel B. Abnormal Returns after Public Disclosures of Insider Sales						
Combined	38,436	−1.88%**	−0.18%	0.30%	−1.13%**	−2.89%**
CEO	24,527	−1.98%**	0.17%	0.55%**	−1.37%**	−2.63%**
CFO	13,909	−1.71%**	−0.80%**	−0.14%	−0.70%**	−3.35%**
CFO – CEO		0.27%	−0.97%**	−0.69%*	0.67%*	−0.72%*
Cumulative diff.		0.27%	−0.70%*	−1.39%**	−0.72%*	

For sales, CEOs (CFOs) avoid a negative return of –2.63% (–3.35%) during the 12 months after the filing days. The difference between CEO and CFO returns is only 0.72 percentage points, which is significant but not necessarily economically meaningful.

To accommodate the possibility that news about insider trades is disclosed prior to the official filing dates, we also vary the starting point of cumulating these returns up to 5 days following purchases and sales and obtain qualitatively similar results. Taken together, these findings show that the abnormal returns reported following trades by insiders, and in particular CFOs, cannot be entirely attributed to returns earned prior to the filing of their trades. This suggests that the market may be slow in incorporating the information contained in CFO purchases.

To assess how the market reacts to the public disclosure of insider trades, we compute abnormal returns in the 3-day window (–1, +1) around the filing day. The results are reported in Table 7. The average CAR during the 3-day window around CEO purchase filings is 0.022%, not significantly different from 0. On the other hand, the average 3-day CAR around CFO filing is 0.232%, which is statistically significant. The difference (0.210 percentage points) between CFO and CEO filing window returns is also significant. However, the magnitude of the filing day window return for the CFO sample is small compared with the 12-month return of 6.19% following the filing day window. These results suggest that even though the market reacts to the public disclosure of CFO purchases, private information contained in such trades is not rapidly incorporated into prices. Turning to insider sales filings, we find that the 3-day CARs around CEO and CFO filings

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TABLE 7

CARs around Insider Trade Filing Day Windows

Table 7 reports mean cumulative abnormal returns (CARs) over the 3-day window (−1, +1) around SEC filings of insider trades (CEOs and CFOs). CAR is calculated as the difference between the return of the individual stock and the return of the benchmark size and book-to-market decile portfolio (10 × 10), cumulated over the measurement window. All stock returns in the portfolio are adjusted by a weighting procedure whereby each observed return is weighted by the gross (1+) return of the same security on day $t - 1$ (Asparouhova et al. (2010a)). * and ** indicate significance at the 5% and 1% levels, respectively.

Insiders	No. of Transactions Filed	CARs around Filing Day Window (−1, +1)
Panel A. Purchases		
CEO	12,936	0.022%
CFO	7,049	0.232%**
CFO – CEO		0.210%*
Panel B. Sales		
CEO	24,527	0.030%
CFO	13,909	−0.047%
CFO – CEO		−0.077%

are not significantly different from 0. Although the market reaction seems more negative on CFO sales than CEO sales, the difference in abnormal returns is not significant.

IV. Insider Trades and Future Earnings Information

So far we have provided evidence that both CEOs and CFOs obtain abnormal positive returns after they purchase stocks and that CFOs earn significantly higher abnormal returns than CEOs. These findings are consistent with the notion that insiders, and in particular CFOs, trade on superior private information. Next, we try to ascertain whether CEOs and CFOs utilize information about future earnings in their trades and whether CFOs' outperformance is attributable to their use of superior information about future earnings. Earnings is an important valuation metric, and the accounting literature since Ball and Brown (1968) has consistently shown that the market reacts to unexpected earnings. Research has suggested that insider trades reveal information about the firm's future earnings performance (Piotroski and Roulstone (2005), Ke et al. (2003)).

If insiders use information about future earnings in their trades, their stock trades should predict subsequent earnings innovations, that is, earnings changes that have not been anticipated by the market (earnings surprise) and thus not already incorporated in the price. In subsequent discussions, we use the term earnings innovations and earnings surprise interchangeably. Specifically, insider purchases should predict positive earnings surprises. Insider sales, to the extent that they are informed as opposed to liquidity sales, should predict negative earnings surprises. Furthermore, if CFOs use superior information about future earnings in their trades, CFO purchases should be a better predictor of future earnings surprises than CEO purchases.

We measure future earnings innovations by the 3-day CARs around quarterly EAs. Earnings innovations should be positively associated with abnormal announcement returns because the market incorporates the surprises in earnings into prices when such information is made public. We measure CARs around

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the first 2 quarterly EAs that take place after CEO and CFO transactions[10] and compare them to CARs around all other EAs made by Compustat firms (the benchmark). If insiders utilize private information about future earnings in their trades, then CARs will be higher after insider purchases and lower after insider sales compared to the benchmark. We also expect announcement CARs after CFO purchases to be higher than those after CEO purchases because CFOs are expected to use superior information relative to CEOs in their purchases. CARs are cumulated over 3 days (–1, +1), that is, the day before EA, the EA day, and the day after EA, to allow for information leakage before the announcement and for announcements after market closes. As discussed earlier in the paper, when computing CARs we make RW adjustments to both the individual returns and the portfolio returns used as benchmarks.

Table 8 reports the results. There are 7,373 (9,560) EAs that take place after CFO (CEO) purchases. After CFO purchases, the average CAR around EA is 0.430%, which is statistically significant. We also compare this return to the average abnormal return around all other EAs made by Compustat firms. The benchmark is needed because, on average, EA CARs need not be 0. Positive abnormal announcement returns, often called EA premiums, are well documented in the literature (e.g., Beaver (1968), Chari, Jagannathan, and Ofer (1988), and Cohen, Dey, Lys, and Sunder (2007)). Frazzini and Lamont (2007) show that the premium is related to the surge of trading volumes around EAs that is attributable to buying from small investors. The benchmark return equals 0.150%. The magnitude

TABLE 8

CARs around EAs Subsequent to Insider Trades

Table 8 reports mean cumulative abnormal returns (CARs) over the 3-day window (−1, +1) around the first 2 quarterly earnings announcements (EAs) that take place after an insider (CEO or CFO) trade. CAR is calculated as the difference between the return of the individual stock and the return of the benchmark size and book-to-market decile portfolio (10 × 10), cumulated over the measurement window. All stock returns in the portfolios are adjusted by a weighting procedure whereby each observed return is weighted by the gross (1+) return of the same security on day $t - 1$ (Asparouhova et al. (2010a)). * and ** indicate significance at the 5% and 1% levels, respectively.

Insiders	No. of EAs	CAR (−1, +1) over EA Windows
All other EAs in Compustat (benchmark)	160,864	0.150%**
First 2 EAs after Insider Purchases		
CEO	9,560	0.216%*
CFO	7,373	0.430%**
CEO – Benchmark		0.066%
CFO – Benchmark		0.280%**
CFO – CEO		0.214%*
First 2 EAs after Insider Sales		
CEO	12,710	0.164%*
CFO	11,859	0.081%
CEO – Benchmark		0.014%
CFO – Benchmark		−0.069%
CFO – CEO		−0.083%
Purchases – Sales		
CEO purchases – CEO sales		0.052%
CFO purchases – CFO sales		0.349%**

[10]The abnormal return pattern we observe in Table 3 (i.e., most insider returns are obtained during the first 6 months after they purchase stocks) suggests that the first 2 quarterly EAs after the trade could reveal the most information. We obtain similar results if we use just the 1st quarterly EA.

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of the return is comparable to what is documented in Cohen et al. (2007). Compared to the benchmark return, the average CAR for the CFO purchase sample is significantly higher. Turning to the CEO sample, the average 3-day CAR around EAs following CEO purchases is 0.216%. It is not significantly different from the benchmark. We also compare the announcement returns obtained by the CFO sample vis-à-vis the CEO sample. We find that the average announcement CAR after CFO purchases is significantly higher than that after CEO purchases.

Our results suggest that CFO purchases are better predictors of positive subsequent earnings innovations than CEO purchases. However, it must be noted that even though our results show that CFO purchases contain information about future earnings, they do not fully explain the source of CFOs' abnormal returns or their outperformance over CEOs. For example, the average CAR over 2 EAs is only 0.860% ($2 \times 0.430\%$), compared to the 6-month abnormal return of 6.75% (5.52% + 1.23%) obtained by CFOs. It appears that EA returns account for only a fraction of the total abnormal returns earned by CFOs.[11]

Turning to insider sales, the 3-day CAR around EAs after CFO sales is 0.081%, which is not significantly lower than the benchmark. For the CEO sample, the average CAR around EAs is 0.164%, which is also indistinguishable from the benchmark. The announcement returns by the CFO sample appear lower than those by the CEO sample, although the difference is not statistically significant.

We also compare returns from the CFO purchase sample with those of the CFO sales sample. We find that earnings surprises are more positive after CFO purchases than after CFO sales. For CEOs, the difference in announcement returns between the purchase and sales samples is insignificant.

In summary, by examining abnormal returns around EAs subsequent to insider trades, we obtain evidence that CFO purchases predict more positive earnings surprises than CEO purchases. This is consistent with the notion that CFOs use superior information about future earnings in their trades compared with CEOs. Beneish and Vargus (2002) find that net stock sales (sales minus purchases) made by top insiders, including CEOs and CFOs, predict future earnings quality. Our results suggest that an investor can make better predictions about future earnings surprises based on CFOs' trading behavior.

V. Summary and Conclusion

In this paper we investigate whether trades made by CFOs reveal more information about future stock returns than those made by CEOs. We find that CFOs derive statistically and economically higher abnormal returns from their purchases of company shares than do CEOs. Furthermore, CFOs' excess return is robust to controlling for risk factors. Our results are consistent with CFOs utilizing more (superior) information in their purchase transactions compared to CEOs. The excess returns by CFOs persist even after the trading information is made public,

[11]The samples in Tables 3 and 8 differ slightly because there are instances in which EA dates are missing from Compustat. There are also instances where multiple purchases precede an EA. We only count 1 observation in Table 8, but our results are robust when we include multiple counts of EAs in accordance with the number of trades.

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suggesting that the market is slow in incorporating the information in CFOs' trades.

We also show that CFO purchases predict more positive future earnings surprises than CEOs. We interpret this result as being consistent with CFOs using superior information about future earnings in their purchase decisions. However, the EA window returns are small compared to CFOs' overall returns, indicating that CFOs' purchases contain more information than that in earnings. Our study has implications for both investors and regulators. Investors may utilize information revealed in insider trades to make investment decisions. Our results suggest that purchase transactions by CFOs, compared to CEOs, provide superior information to investors. Given that risk-adjusted abnormal returns are still obtained after CFO trades become public knowledge via SEC filings, mimicking CFO purchases may be a profitable trading strategy.

Following the corporate scandals in the early 2000s, there has been increased regulatory and legislative scrutiny on corporate governance. The regulators have singled out the CEO and the CFO as the 2 individuals bearing responsibilities for the integrity of firms' financial information. This paper lends some support to the increased regulatory oversight and especially to the inclusion of the CFO, in addition to the CEO, as an accountable individual. It suggests that CFOs should bear more scrutiny from regulators with respect to their trading profits.

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