Measuring CEO Talent and Its Impact on Firm Performance:

A theoretical integration and empirical analysis

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Abstract

This paper analyzes whether CEOs who are good contrarian investors, good forecasters, or good market timers can run their firms better. Besides using the timing measure which combines returns before and after the trade, we also use the past return measure to estimate the contrarian aspect of CEO trades and the future return measure to assess CEO's ability to forecast stock returns. Our results suggest that CEOs' managerial talent and valuation ability are primarily related to CEOs' past return measure, while high post-trade returns indicate the expropriation motive for CEO trades. Overall, we obtain strong evidence to support the idea that CEOs who are good contrarian investors tend to run their firms better on average than other CEOs.

Keywords: CEO, Contrarian, Talent, Insider Trading

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1. Introduction

The relationship between the characteristics of chief executive officers (CEOs) and organizational performance has been the subject of increased research attention in both strategic management and financial economics literature because the chief executive officer (CEO) is generally regarded as the most powerful organizational member. Given their leadership positions and compensation, CEOs likely have a significant impact on the success of the companies they run. In this paper, CEOs are characterized by a variable referred to as talent, and firms are also characterized by a single variable, namely firm performance. The impact of CEO talent on firm value appears to be quite significant (Hae and Ajay, 2012). In this study we define talent as an observable measure-the CEO's trading performance in her own company's stock.

CEOs can positively affect firm performance by their ability to process economic information and make optimal decisions to increase shareholder value, and this ability may also help CEOs make investment decisions about their personal portfolios. We refer to this as a *talent perspective.* On the other hand, given inherent principal-agency conflicts in firms, CEOs can also adversely affect the firm performance by using private information to profit themselves at the expense of other shareholders, which can be formalized as the *expropriation perspective.* Therefore, whether successful trading performance is a good or bad CEO characteristic, that is its relationship with firm performance, is what we aim to test.

Our work revisits the fundamental question of how important CEO trading performance is for firm performance, which is raised and explored by the study of Rubin and Vedrashko (2011). Their study concludes that CEOs who exhibit better trading performance also tend to run their companies well and outperform other firms in the same industry, that is, there is a positive

relation between CEO trading performance and firm performance, which demonstrates that talent perspective dominates the expropriation perspective. This holds not only when all transactions are analyzed together, but also when sales and purchases are analyzed separately. They also find a modest support for CEO trading performance predicting future firm performance in an out-of-sample analysis. We extend the sample period of that study to include the five years after 2006. In contrast with the findings of Rubin and Vedrashko (2011), we found weak empirical support to the talent perspective with a mix of positive and negative coefficients in the analysis of all transactions types combined and in the separate sales/purchase transaction analysis. We also conduct a different procedure for out-of-sample analysis and find little support for the talent perspective.

On top of reexamining the main argument in the Rubin and Vedrashko (2011) paper, our study offers a significant contribution. In Rubin and Vedrashko (2011), the underlying idea is to use the *timing measure* of CEO trading performance that is the sum of the return before the trade (past return) and the return after the trade (future return). The timing measure is designed to capture the timing ability of the trading CEO, i.e. the ability to buy low and sell high. Our use of the past return measure allows us to estimate the contrarian aspect of CEO trades. The future return measure allows us to assess CEO's ability to forecast stock returns. In our study, we analyze the relationship between firm performance separately on past return and future return measures besides the timing measure.

Prior research supports the hypothesis that insiders are contrarian traders. Seyhun (1992) shows that insiders are more likely to sell (purchase) shares following periods of significant price appreciation (declines), consistent with insider trading in anticipation of subsequent price reversals. Being a good contrarian can indicate either CEO expropriation or CEO valuation talent.

As a good contrarian, a CEO is able to assess the intrinsic value of the firm and identify any stock mispricing. A CEO with particularly good valuation ability is expected to make purchases (sales) when the stock is most undervalued (overvalued). In the talent perspective, this valuation ability is related to CEO ability to make optimal corporate decisions on promising projects, financing options and firm strategy. However, for example, if the CEO has negative private information about his/her firm, he/she can postpone her stock purchase until after the news is released and the stock price declines. In this case the CEO has used informational advantage to expropriate when he/she buys shares at the relatively low price. Similarly, waiting to sell shares until after positive news is released and followed by a stock price runup represents expropriation, which is measured by the pre-trade price runup.

This valuation ability is best evaluated by the return prior to the trade. Accordingly, we try to estimate whether CEOs who are good contrarian investors can run their firms better. In our results, we find this is true when all transactions are considered, but this relation is especially strong in sales transactions.

As for a good future return measure, it seems to be more related to good valuation talent. The after-trade return captures CEO's forecasting ability on whether CEO can successfully anticipate the price change after the transaction. Trueman (1986) suggests that managers provide earnings forecasts to signal their superior ability in anticipating future changes in the firm's economic environment and adjusting the firm's production plans accordingly. This, in turn, will increase the firm's market value. However, favorable stock returns after the trade can also be expropriation if, for example, the CEO sells before bad news about the firm become public. The talent perspective predicts a positive relationship between CEO's superior forecasting ability and firm performance. However, our test results show little support for our expectation and

demonstrate that good forecasters can actually negatively affect firm performance.

We also measure whether CEO trading performance can predict future firm performance under that CEO in an out-of-sample test. Surprisingly, we find a negative correlation between CEO trading performance and future firm performance.

To summarize, our results for the timing, past, and future measures indicate that CEOs' managerial talent is most related to CEOs' the past return measure. This measure captures the CEO's ability to recognize when the firm's stock is mispriced relative to its intrinsic value. We note that Warren Buffett is commonly associated with this type of valuation ability and a contrarian trading and investment pattern. The remainder of the paper is organized as follows. In section 2: we describe our data and empirical analysis. In section 3: summary statistics on data are provided. In section 4: we present the model. Section 5 presents the empirical results of our model analysis on relationship between CEO trading performance and firm performance. Section 6 concludes.

2. Data Description

This section details how we constructed the dataset and the collection process for each of our variables.

2.1 CEO Timing, Past Return, and Future Return Measures

Our key explanatory variable is CEO talent. We proxy it by CEO trading performance. To capture it, we use the returns both before and after the CEO's trades in her firm's stock. For any forward-looking investors, a good trade strategy is to buy own-firm stocks at the lowest price and sell them at the highest price in order to maximize their returns. By their ability to better estimate firm's underlying value and be more likely to identify any mispriced than average

investors in the market, CEOs are expected to follow the above strategy and find the best near points to trade.

When purchase happens at the lowest point (lowest price), stock price has declined until this point and then rise. When sale happens at the highest point (highest price), stock price has risen until this point and then decline. Therefore, in order to determine whether CEO trade near these points, we need to use both pre-trade and post-trade returns.

Problems are inherent if we only use before-trade or after-trade return to determine whether a trade is timed well. Given a steady upward price trend, a purchase at the beginning of this trend and another purchase at the middle of this trend will both be evaluated as good trades if only based on post-trade return. However, it is obvious that the purchase at the beginning of the upward trend is better than the later one in terms of earning potential. More importantly, for sales, investors' wealth would not be affected by a price change on the sold shares (post-sale return), while for purchase, investors' wealth would not be affected by a price change on the not-yet purchased shares (pre-purchase return). Accordingly, a single pre- or post-trade return can not be consistently applied to both purchase and sales due to the inconsistent comparison on the quality of all trades in terms of the CEO's wealth.

Taken together, we would better determine whether a trade is timed too early or too late by combining both pre-trade and post-trade return, which generates the timing measure. To compute the timing measure, we sum the *buy-and-hold returns (BHARs)* before and after the trade. Precisely, for a purchase, the timing measure is the negative of the return from holding the shares for a certain length of time before the purchase plus the positive of the return for the same length of time after the purchase. For sale, the signs are reversed. That is, the timing measure is the positive of the return from holding the shares for a certain length of time before the sale plus

the negative of the return over the same length of time after the sale. The lengths of time before trade and after trade are equal and symmetric, which can be 0.5 year or 1 year in our tests.

As alternative measures of CEO talent proxied by CEO trading performance, we also consider the past return and future return measures. For CEO purchase transactions, the past return measure is the negative of the return from holding the shares for a certain length of time before the purchase, and the future return measure is the return for the same length of time after the purchase. For sales transactions, the things on the returns are reversed for each measure. The past return measure would capture the contrarian aspect of CEO trading performance. The future return measure captures CEO forecasting ability. The three measures are defined in such a way that the talent perspective predicts a positive relation between each of them and firm performance.

2.2 Data Sources for CEO Trading Performance:

2.2.1 CEO Sample

To construct our talent measure, we collect detailed information on purchases and sales by CEOs from Thompson Financial Insider Filing Data where have all corporate insider trading activities reported on SEC From 3, 4 and 5. We collect firm-CEO observations over the period 1996-2011. In fact, Rubin and Vedrashko sample only covers a ten-year period (1996-2006). To get suitable data, we first discard firms that are not in the CRSP database 1.5 years before and one year after the transaction (one year is the longest time horizon we used in our test and the extra 0. 5 years are for estimation purposes in the abnormal returns model). We also eliminate those insignificant cases where CEO traded only once or transactions whose values are under $500 and whose number of shares is under 100. Lastly, the amount of time between the first and last trades needs to be at least two years in order for the CEO to run the company long enough to

have an effect on the firm's performance. These filters help concise our sample size to 4707 CEOs.

2.2.2 Raw Return and Abnormal Return

As mentioned above, CEO trading performance is measured by returns, either raw returns or abnormal returns. We decide to use both of them to ensure the robustness of our results. Abnormal returns for CEO trading performance measures are computed by both the Fama-French four-factor model and CAPM respectively. In the Fama-French four-factor model, risk-free rate, three Fama-French (Fama and French, 1993) factors-market, style, size and the fourth factor-momentum that is derived from Carhart (Carhart,1997) model are all acquired from Kenneth French's website. In the CAPM model, the expected return on the market is the value-weighted return from CRSP. Raw and abnormal returns around the trades have been calculated using Eventus. Since the objective of our test is to compare CEOs to each other rather than the same CEOs across different years, we aggregate the trading performance of each CEO over the whole sample period by weighting each trade by its dollar value. By doing this, we obtain a single value-weighted timing measure for each CEO. That is, our analysis is based on the cross-sectional variation among CEOs.

2.3 Firm Performance and Firm-Level Controls

We use stock market-based measure of performance, which is based on stock returns from CRSP, as well as a variety of firm-level controls whose importance has been documented in the literature. All measures are at calendar year-end.

Since the firm performance depends both on industry performance and CEO's own ability to run the company, we use industry-adjusted returns to measure firm performance. Relative to the same benchmark (industry), we are able to compare whether a firm is ran by its

CEO better than the other. That is, we analyze whether the difference between firm returns and the industry return can be attributed to CEO's ability.

To give each firm the benchmark (industry), we classify each firm in the sample to one of 48 Fama-French industries based on their Standard Industrial Classification (SIC) code. Then we download firm's monthly holding period returns (HPR) (including dividends) from CRSP and monthly returns for Fama-French 48-industry portfolios from the Kenneth French's website. After calculating the annual return for each firm and annual return for each industry, we can generate industry-adjusted return by subtracting the corresponding Fama-French industry annual return from firm's annual HPR.

3. Summary Statistics

Over the period of 1996-2011, 4,707 CEOs made 94,216 transactions, of which 68,379 are sales (72.58%). Table 1 shows the summary statistics for raw returns and abnormal returns based on the CAPM as well as the Fama-French four-factor model. The results in the table indicate that CEOs demonstrate positive timing, past and future measures and better trading performance than average investors: According to all timing measures, 74％ to 81% of the CEOs are associated with a positive timing measure. In additional, the positive past measure indicates that CEOs are in general contrarian investors, and the positive future measure indicates that CEOs are good forecasters of future performance of their firm's stock.

4. Empirical Model Description

In this section, we develop a simple model for the relationship between CEO talent and firm performance. Our model is based on recent work by Rubin and Vedrashko (2011).

We analyze the relationship between firm performance and CEO trading performance both in short-term and long-term, which refer to the time series and the cross-sectional analyses with dates t=1, 2...15.

4.1 The short-term (time-series) model

The short-term (time-series) model is described by the following equation:,

$$R_{it} = \alpha + \beta P_i + \gamma X_{it-1} + \varepsilon_{it}, \qquad (1)$$

where the independent variable is Pi, which stands for the CEO i's trading performance measure and equals to the value-weighted average of the timing, past, or future return measure as mentioned in section 2.1 . The time variable t takes value 1, 2, … ,15 as our sample period. The dependent variable R_{it} is the one-year industry –adjusted BHAR (%) of holding the specific company's stock in year t. X_{it-1} are the control variables which include firm Size, Book to market, Volatility of returns in year (t-1) and Dependent. *Size* is the log of the market value of each company at the end of each calendar year. *Book –to-market* is the book value of total shareholder equity divided by the market value of equity at the end of each calendar year. *Volatility* is the log of the standard deviation of daily returns of holding shares of a company. *Dependent* is the lag of the dependent variable relative to the year t in order to control for possible momentum effects or mean reversion in the industry. The short time analysis is made using CEO –clustered errors (Petersen, 2009).

Both our sets of talent proxies and controls, as well as our outcome variables, are described in the data section.

4.2 The long-term (cross-sectional) model

Since this model's implications are cross-sectional, we take the average of the dependent

variables and control variables for each firm over the time period to estimate the long-term (cross-sectional) model, which is described as follows:

$$R_i = \alpha + \beta P_i + \gamma X_i + \varepsilon_i \quad (2)$$

In this model, the independent variables are the same as those in model (1). Importantly, the control variables are also the same as in model (1), but without the lagged dependent variable because we removed the time dimension in model (2).

In each test, we include a number of controls for firm and CEO characteristics, such as firm size, BM, volatility of returns that have been found to be important covariates of outcomes in previous studies. We control for firm size in all of the regressions since the earlier research shows that it is more probable for CEOs who are more talented to work for bigger firms because they can bring more profits for shareholders in this kind of firms (Himmelberg and Hubbard, 2000). Book-to-market is also a control variable we take into account according to the findings show that much of insider's abnormal trading performance is related with small and high book to market forms (Jenter, 2005; Lakonishol and Lee, 2001; Rozeff and Zaman, 1998). As powerful CEOs can be associated with firm performance which is more volatile (Adams et al., 2005), we also regard stock return volatility as a control variable in order to reduce the possibility that our relation results of CEO trading performance and firm performance are associated with CEOs who are more powerful rather than more talented. Another reason we take volatility as a control variable is that CEOs are exposed to unsystematic risk. We obtain these firm-specific variables from the Compustat annual database as well as CRSP.

5. Empirical Results

The talent hypothesis predicts that the coefficients on CEO trading measures are positive, and the expropriation hypothesis predicts that they are negative or equal to zero.

5.1 Full Sample Results -Timing Measure

The estimated results of short-term model (1) are shown in Panel A of Table 2. Specifically, as for the timing measure, the results are mixed that raw returns of CEO trading have positive and significant correlations to firm industry-adjusted annual return as we expect, while CEO abnormal returns show negative correlation with firm return. The long term estimation results in Panel B show that raw return is consistent with our expectation given their positive and significant coefficients with firm performance. To summarize, it is difficult to conclude that whether a CEO's talent perspective dominates the expropriation perspective based of the timing measure of CEO talent due to dispersed testing results.

The coefficient of control variable Size is negative which means that small firms achieve higher industry-adjusted annual returns than large firms do in short term analysis, while the situation is opposite in long term analysis because firms which could perform better in the industry could achieve higher market value in the full sample period. The signs on Book-to-market are also opposite. Besides, high volatility firms have better performance than low volatility firms in both analyses. We further find that the lagged dependent variable has a negative correlation with current firm industry-adjusted return, which implies that returns of firms in an industry are likely to revert to the mean return of the industry.

5.2 Full Sample Results-- Past Return and Future Return Measures Separately

When separately evaluating past return and future return measures, we find the past

return measure is fairly consistent with the talent perspective as the significant positive coefficients shown in Panel D of Table 2, but this is not the case for the future return measure that gives us quite a few significant negative relationships in Panel E. It is possible that these results indicate that past returns capture CEO talent and valuation ability, while post-trade returns indicate the expropriation motive for CEO trades.

5.3 Subsample Results-- Purchases and Sales

A potential pitfall of regressing firm's industry-adjusted returns on CEO trading measures is that the correlation between them can be mechanical since both of the variables are based on the firm's stock returns. Since the returns in the trading measures have opposite signs for purchases and sales, if the correlation is mechanical, it would result in opposite signs for purchases and sales in the regression. We separate the full sample to purchases only subsample and sales only subsample. For the tests of the talent hypothesis to be valid, positive correlations between CEO trading measure and firm performance must be present in both subsamples.

All the regression results of purchases are shown in Panel A of Table 3. In Panel A.1, the mixed regression results are largely consistent with our expectation. To be specific, for the timing measure, all coefficients except the one on the six-month money market measure show positive and significant correlation with firm performance. Then we can find results of past return measure and future return measure for the purchases only subsample from Panel A.2 and Panel A.3. Only the half-year abnormal return based on CAPM model suggests the positive and significant correlation with firm industry-adjusted return in Panel A.2, other regression results provide very little support with our expectation. In Panel A.3, for future return measures, the results of one-year abnormal return based on CAPM model and raw returns are positive, consistent with our expectation.

Then we look at the estimation results for the sales only subsample. In Panel B.1, the one year abnormal return based on Fama-French model and CAPM model do not indicate a positive and significant relationship with firm performance and have insignificant coefficients. For other results of raw returns or abnormal returns, we can find positive and very significant coefficients with firm industry-adjusted returns. According to the positive significant coefficients shown in Panel B.2, our idea that CEOs are contrarians and the firm performance is positively associated with CEO's managerial talent gets support. However, in Panel B.3, the regression results are different from our expectations due to the negative relationships displayed.

5.4 Out-of-Sample Results

We also measure whether CEO trading performance can predict future firm performance under that CEO in an out-of-sample test. Table 4 reports the results of this out-of-sample analysis. We calculate the CEO trading measures based on the first three years of CEO trades. Then we estimate models (1) and (2) the firm returns during period starting one year after the three years period of the CEO measure and end with CEO's last trade in the sample period. This procedure changes the sample significantly because it eliminates CEOs with fewer than five years of trades, leaving approximately a quarter of the original observations in the sample. Surprisingly, the only statistically significant (although, negative) coefficients we find are on the one-year abnormal measure that is based on CAPM model. Unfortunately, as for economic meaning, the really small coefficients imply no important impact on dependent variable.

6. Conclusions and Implications

CEOs could achieve better trading performance than the outside investors since they can have private information about the firm. On one hand, expropriation takes place when the CEO

achieves the better performance by superior access to information. On the other hand, if CEOs achieve better trading performance in the firm's stock based on their ability to interpret information, CEOs have the talent to find the misvaluation of the firm and provide successful managerial performance for the firm.

In this paper, we first revisit the relation between the CEO trading performance and firm performance using the timing, past, and future measures of CEO trading performance. Different from Rubin and Vedrashko, we got a mix of positive and negative coefficients for the timing measure in the full sample for all transactions, which could not support enough for the idea that talent perspective dominates the expropriation perspective, if the timing measure is the appropriate proxy of CEO talent.

Then we make some contribution to Rubin and Vedrashko's paper by separating the timing measure of sum returns to past returns and future returns as measures of CEO trading performance to try to estimate whether CEOs who are good contrarian investors or good forecasters can run their firms better. Our regression results provide strong evidence that our idea is true for contrarian CEOs.

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Appendix

Table 1
CEO Trading Performance

Median return is the median (%) of the CEO timing measure, past return measure and future return measure. Percent positive is the percentage of CEOs whose timing measure, past return measure, and future return measure is positive. The timing measure is the raw or abnormal return of holding (shorting) a share of the company's stock for one year or six months following the date of purchase (sale) plus the abnormal return of shorting (holding) the share for one year or six months prior to the purchase (sale) date. The past return measure is the raw or abnormal return of shorting (holding) the share for one year or six months prior to the purchase (sale) date. The future return measure is the raw or abnormal return of holding (shorting) a share of the company's stock for one year or six months following the date of purchase (sale). CEO abnormal return is the value-weighted (by transaction value) abnormal return based on the market or four-factor Fama-French model.

	Raw return		Market model		Four Factors model	
	6 mos	12 mos	6 mos	12 mos	6 mos	12 mos
Median return (timing measure)	21.23	34.53	16.96	26.65	15.90	25.93
Percent positive (timing measure)	80.92	80.39	78.59	76.48	74.89	74.06
Median return (past return)	20.24	34.09	4.52	3.78	4.41	3.28
Percent positive (past return)	83.43	83.41	68.67	53.81	57.68	52.50
Median return (future return)	1.28	1.71	11.97	22.08	10.54	21.37
Percent positive (future return)	52.84	52.28	70.21	68.66	67.58	67.79

Table 2

CEO Trading Measures and Firm Performance - Full Sample

In Panels A, C, and E the dependent variable is the firm's *industry-adjusted annual return* (%), which equals the firm's annual holding period return (including dividends) minus the corresponding Fama-French industry annual return. In Panels B, D, and F, the dependent and control variables are averaged over years to produce one observation per CEO. The timing, future return, and past return measures are defined in Table 1. The numbers 365 and 183 in the names of CEO performance measures stand for one year and six month measures, respectively. *mm* stands for CEO abnormal return calculated by estimating the market model (CAPM), and *ff* stands for CEO abnormal return calculated by estimating the four-factor Fama-French model. In Panel A and Panel B, the regressions are estimated only for the CEO timing measure, and in Panels C, D, E and F, the regressions are estimated only for CEO past return and CEO future return measures, respectively. *Size* is the log of the market value of the firm. *Book-to-market* is the book value of equity divided by the market value of the equity. *Volatility* is the log of the standard deviation of daily returns. The *t-statistics* in parentheses are calculated with CEO clustered standard errors in Panel A and Huber-White robust standard errors in Panel B. Coefficients whose significance is at the 5% level or less are indicated in bold.

Panel A: Short term relation between firm performance and timing measures

	(1)	(2)	(3)	(4)	(5)	(6)
CEO abnormal return (365mm)	-0.0181 (-0.54)					
CEO abnormal return (365ff)		-0.0067 (-0.27)				
CEO raw return (365raw)			**1.3602 (2.84)**			
CEO abnormal return (183mm)				**-0.0010 (-2.36)**		
CEO abnormal return (183ff)					**0.6185 (2.00)**	
CEO raw return (183raw)						**1.7406 (3.00)**
Size (t-1)	**-2.7969 (-8.37)**	**-2.8007 (-8.39)**	**-2.7924 (-8.39)**	**-2.7994 (-8.38)**	**-2.7849 (-8.35)**	**-2.8029 (-8.39)**
Book-to-Market (t-1)	**4.8620 (3.59)**	**4.8630 (3.59)**	**4.9524 (3.63)**	**4.8633 (3.59)**	**4.8903 (3.60)**	**4.9276 (3.62)**
Volatility (t-1)	**480.4952 (9.26)**	**479.4376 (9.25)**	**453.9553 (8.76)**	**479.1840 (9.24)**	**472.6776 (9.15)**	**459.5824 (8.93)**
Dependent (t-1)	**-3.9306 (-6.09)**	**-3.9295 (-6.09)**	**-4.0778 (-6.43)**	**-3.9303 (-6.09)**	**-3.9553 (-6.12)**	**-3.9919 (-6.17)**
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	29179	29179	29179	29179	29179	29179
R-squared	0.06179	0.062	0.0638	0.0618	0.0621	0.0628

Table 2 Continued –**Panel B**: Long term relation between firm performance and timing measures

	（1）	(2)	(3)	(4)	(5)	(6)
CEO abnormal return (365mm)	0.0018 (0.09)					
CEO abnormal return (365ff)		0.0143 (1.07)				
CEO raw return (365raw)			**1.3542 (5.69)**			
CEO abnormal return (183mm)				**-0.0030 (-18.83)**		
CEO abnormal return (183ff)					**0.6566 (5.43)**	
CEO raw return (183raw)						**1.6809 (6.60)**
Average Size	**2.5238 (20.01)**	**2.5238 (19.98)**	**2.4828 (19.54)**	**2.5282 (20.02)**	**2.5277 (20.05)**	**2.4855 (19.97)**
Average Book-to-Market	**-1.1350 (-2.29)**	**-1.1320 (-2.28)**	-0.9250 (-1.89)	**-1.1390 (-2.29)**	**-1.0800 (-2.19)**	**-1.0004 (-2.06)**
Average Volatility	**644.6962 (25.42)**	**644.1561 (25.35)**	**604.9401 (22.98)**	**644.6561 (25.37)**	**633.9210 (25.39)**	**615.6811 (25.36)**
Number of observations	30307	30307	30307	30307	30307	30307
R-squared	0.0702	0.0703	0.0845	0.0703	0.0730	0.0770

Table 2 Continued –**Panel C:** Short term relation between firm performance and **Past return measure**

	（1）	(2)	(3)	(4)	(5)	(6)
CEO abnormal return (365mm)	0.0018 (1.89)					
CEO abnormal return (365ff)		**0.0012 (4.65)**				
CEO raw return (365raw)			1.5324 (1.78)			
CEO abnormal return (183mm)				**0.0001 (4.47)**		
CEO abnormal return (183ff)					0.0569 (0.31)	
CEO raw return (183raw)						0.7549 (0.97)
Size (t-1)	**-2.7908 (-8.35)**	**-2.7991 (-8.38)**	**-2.7869 (-8.40)**	**-2.7990 (-8.38)**	**-2.7995 (-8.38)**	**-2.7995 (-8.40)**
Book-to-Market (t-1)	**4.8630 (3.59)**	**4.8626 (3.59)**	**4.8770 (3.61)**	**4.8633 (3.59)**	**4.8633 (3.59)**	**4.8616 (3.60)**
Volatility (t-1)	**481.3735 (9.28)**	**479.7256 (9.25)**	**452.7442 (8.59)**	**479.1498 (9.24)**	**479.0246 (9.24)**	**472.2850 (9.09)**
Dependent (t-1)	**-3.9314 (-6.09)**	**-3.9276 (-6.08)**	**-4.1427 (-6.36)**	**-3.9302 (-6.09)**	**-3.9299 (-6.09)**	**-3.9574 (-6.12)**
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	29179	29179	29179	29179	29179	29179
R-squared	0.0618	0.0618	0.0643	0.0618	0.0618	0.0622

Table 2 Continued –**Panel D:** Long term relation between firm performance and **Past return measure**

	（1）	(2)	(3)	(4)	(5)	(6)
CEO abnormal return (365mm)	5.718E-4 (0.64)					
CEO abnormal return (365ff)		-4.04E-5 (-0.14)				
CEO raw return (365raw)			**1.5567 (3.14)**			
CEO abnormal return (183mm)				**4.063E-4 (43.82)**		
CEO abnormal return (183ff)					0.0432 (0.50)	
CEO raw return (183raw)						0.7672 (1.67)
Average Size	**2.5291 (20.09)**	**2.5244 (19.99)**	**2.4785 (19.54)**	**2.5284 (20.02)**	**2.5251 (19.97)**	**2.5122 (19.98)**
Average Book-to-Market	**-1.1360 (-2.29)**	**-1.1350 (-2.29)**	**-1.0570 (-2.13)**	**-1.1390 (-2.29)**	**-1.1370 (-2.29)**	**-1.1340 (-2.30)**
Average Volatility	**645.9228 (25.51)**	**644.8542 (25.39)**	**601.2950 (21.83)**	**644.5776 (25.37)**	**644.6640 (25.43)**	**633.9601 (24.73)**
Number of observations	30307	30307	30307	30307	30307	30307
R-squared	0.0703	0.0702	0.0887	0.0704	0.0702	0.0730

Table 2 Continued –**Panel E:** Short term relation between firm performance and Future return measure

	（1）	(2)	(3)	(4)	(5)	(6)
CEO abnormal return (365mm)	-0.0017 (-1.82)					
CEO abnormal return (365ff)		**-0.0011 (-4.14)**				
CEO raw return (365raw)			-0.0996 (-0.40)			
CEO abnormal return (183mm)				**-0.0001 (-4.31)**		
CEO abnormal return (183ff)					**0.2578 (2.45)**	
CEO raw return (183raw)						0.1282 (0.84)
Size (t-1)	**-2.7911 (-8.36)**	**-2.7992 (-8.38)**	**-2.8003 (-8.39)**	**-2.7991 (-8.38)**	**-2.7993 (-8.38)**	**-2.8010 (-8.39)**
Book-to-Market (t-1)	**4.8629 (3.59)**	**4.8626 (3.59)**	**4.8579 (3.59)**	**4.8633 (3.59)**	**4.8758 (3.60)**	**4.8685 (3.59)**
Volatility (t-1)	**481.3455 (9.28)**	**479.7211 (9.25)**	**479.3886 (9.25)**	**479.1536 (9.24)**	**477.5795 (9.22)**	**478.9943 (9.24)**
Dependent (t-1)	**-3.9314 (-6.09)**	**-3.9277 (-6.08)**	**-3.9337 (-6.08)**	**-3.9303 (-6.09)**	**-3.9448 (-6.12)**	**-3.9307 (-6.09)**
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	29179	29179	29179	29179	29179	29179
R-squared	0.0618	0.0618	0.0618	0.0618	0.0619	0.0618

Table 2 Continued –**Panel F:** Long term relation between firm performance and Future return measure

	（1）	(2)	(3)	(4)	(5)	(6)
CEO abnormal return (365mm)	-5.16E-4 (-0.60)					
CEO abnormal return (365ff)		6.394E-5 (1.07)				
CEO raw return (365raw)			-0.112 (-0.78)			
CEO abnormal return (183mm)				**-3.62E-4 (-41.37)**		
CEO abnormal return (183ff)					**0.2901 (5.39)**	
CEO raw return (183raw)						0.0874 (0.84)
Average Size	**2.5289 (20.09)**	**2.5243 (19.99)**	**2.5246 (20.00)**	**2.5284 (20.02)**	**2.5212 (19.98)**	**2.5238 (19.98)**
Average Book-to-Market	**-1.1360 (-2.29)**	**-1.1350 (-2.29)**	-1.1470 (-1.89)	**-1.1390 (-2.29)**	**-1.1040 (-2.23)**	**-1.1290 (-2.28)**
Average Volatility	**645.8769 (25.50)**	**644.8323 (25.38)**	**645.0524 (25.40)**	**644.5861 (20.20)**	**641.5328 (25.33)**	**615.6184 (25.37)**
Number of observations	30307	30307	30307	30307	30307	30307
R-squared	0.0703	0.0702	0.0704	0.0703	0.0713	0.0703

Table 3: CEO Trading Measures and Firm Performance – Purchases and Sales

The dependent variable is *annual industry-adjusted* or *average industry-adjusted return* over the sample period and defined as in Table 2. In Panel A, the regressions are estimated only for purchases, and in Panel B, the regressions are estimated only for sales. CEO return measure are defined in Table 1, and the other variables are defined in Table 2. Coefficients whose significance is at the 5% level or less are indicated in bold.

Panel A.1: Firm Performance and Timing Measures: Purchases only

	(1) Industry-adjusted return	(2) Average Industry-adjusted return	(3) Industry-adjusted return	(4) Average industry-adjusted return	(5) Industry-adjusted return	(6) Average industry adjusted return	(7) Industry-adjusted return	(8) Average Industry-adjusted return	(9) Industry-adjusted return	(10) Average industry-adjusted return	(11) Industry-adjusted return	(12) Average industry adjusted return
CEO abnormal return(365mm)	**0.0071** **(10.92)**	**0.0083** **(26.67)**										
CEO abnormal return(365ff)			**0.0576** **(3.34)**	**0.0444** **(6.24)**								
CEO raw return(365raw)					**6.7025** **(2.09)**	**5.6950** **(4.53)**						
CEO abnormal return(183mm)							**-0.0019** **(-4.32)**	**-0.0050** **(-36.67)**				
CEO abnormal return(183ff)									**5.7445** **(2.09)**	**4.0340** **(4.03)**		
CEO raw return(183raw)											**5.0267** **(2.08)**	**3.1158** **(3.64)**
Size	**-3.2869** **(-5.10)**	**3.1538** **(10.44)**	**-3.3278** **(-5.16)**	**3.0954** **(10.28)**	**-3.7205** **(-5.38)**	**2.5667** **(10.08)**	**-3.3152** **(-5.14)**	**3.1211** **(10.37)**	**-3.4639** **(-5.31)**	**2.9372** **(9.86)**	**-3.5409** **(-5.37)**	**2.9055** **(9.59)**
Book-to-market	**8.3323** **(2.79)**	-0.2600 (-0.31)	**8.3361** **(2.79)**	-2.5300 (-0.30)	**8.2484** **(2.78)**	-5.7400 (-0.67)	**8.3353** **(2.79)**	-0.2600 (-0.31)	**8.3176** **(2.79)**	-0.3220 (-0.38)	**8.3256** **(2.79)**	-3.1200 (-0.37)
Volatility	**430.6755** **(-4.82)**	**532.4824** **(11.49)**	**424.8785** **(5.48)**	**524.4655** **(11.34)**	**383.3996** **(4.94)**	**466.5298** **(12.03)**	**462.8454** **(5.51)**	**526.3834** **(11.38)**	**405.6849** **(5.39)**	**502.9943** **(11.15)**	**405.9594** **(5.36)**	**505.9728** **(10.99)**
Dependent *t-1*	**-4.3625** **(-4.82)**		**-4.3461** **(-4.80)**		**-4.4615** **(-4.74)**		**-4.3421** **(-4.80)**		**-4.4208** **(-4.85)**		**-4.3669** **(-4.84)**	
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	10018	10525	10018	10525	10018	10525	10018	10525	10018	10525	10018	10525
R-squared	0.0845	0.0531	0.0844	0.0521	0.0883	0.0722	0.0843	0.0523	0.0855	0.0560	0.0854	0.0546

Table 3 Continued - **Panel A.2:** Firm Performance and Past Return Measures: Purchases only

	(1) Industry-adjusted return	(2) Average Industry-adjusted return	(3) Industry-adjusted return	(4) Average industry-adjusted return	(5) Industry-adjusted return	(6) Average industry adjusted return	7) Industry-adjusted return	(8) Average Industry-adjusted return	(9) Industry-adjusted return	(10) Average industry-adjusted return	(11) Industry-adjusted return	(12) Average industry adjusted return
CEO abnormal return(365mm)	**-0.0004**	**-3.95E-4**										
	(-10.69)	**(-24.42)**										
CEO abnormal return(365ff)			0.0159	0.0186								
			(0.38)	(1.19)								
CEO raw return(365raw)					-2.1978	**-2.6500**						
					(-0.97)	**(-3.35)**						
CEO abnormal return(183mm)							**0.0002**	**5.20E-4**				
							(4.48)	**(37.38)**				
CEO abnormal return(183ff)									0.6779	4.9060		
									(0.43)	(0.70)		
CEO raw return(183raw)											-2.7867	**-4.2320**
											(-0.93)	**(-3.34)**
Size	**-3.2876**	**3.1525**	**-3.3240**	**3.0949**	**-3.2136**	**3.2611**	**-3.3151**	**3.1210**	**-3.3169**	**3.0984**	**-3.2130**	**3.3014**
	(-5.10)	**(10.44)**	**(-5.15)**	**(10.29)**	**(-4.96)**	**(10.87)**	**(-5.14)**	**(10.37)**	**(-5.16)**	**(10.28)**	**(-4.91)**	**(10.84)**
Book-to-market	**8.3353**	-2.5400	**8.3457**	-0.2360	**8.3917**	-0.1130	**8.3353**	-0.2600	**8.3599**	-0.2250	**8.3592**	-0.1730
	(2.79)	(-0.30)	**(2.79)**	(-0.28)	**(2.81)**	(-0.13)	**(2.79)**	(-0.31)	**(2.80)**	(-0.27)	**(2.80)**	(-0.21)
Volatility	**430.7712**	**532.5378**	**424.4388**	**522.3616**	**434.1147**	**538.8825**	**462.8315**	**526.3454**	**421.6312**	**520.7314**	**433.3205**	**540.5531**
	(5.55)	**(11.49)**	**(5.48)**	**(11.45)**	**(5.58)**	**(11.66)**	**(5.51)**	**(11.38)**	**(5.44)**	**(11.45)**	**(5.57)**	**(11.65)**
Dependent *t-1*	**-4.3612**		**-4.3424**		**-4.4296**		**-4.3421**		**-4.3551**		**-4.4027**	
	(-4.82)		**(-4.80)**		**(-4.92)**		**(-4.80)**		**(-4.80)**		**(-4.91)**	
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	10018	10525	10018	10525	10018	10525	10018	10525	10018	10525	10018	10525
R-squared	0.0844	0.0530	0.0843	0.0520	0.0863	0.0583	0.0843	0.0523	0.0843	0.0519	0.0847	0.0587

Table 3 Continued - **Panel A.3:** Firm Performance and Future Return Measures: Purchases only

	(1) Industry-adjusted return	(2) Average Industry-adjusted return	(3) Industry-adjusted return	(4) Average industry-adjusted return	(5) Industry-adjusted return	(6) Average industry adjusted return	(7) Industry-adjusted return	(8) Average Industry-adjusted return	(9) Industry-adjusted return	(10) Average industry-adjusted return	115) Industry-adjusted return	(12) Average industry adjusted return
CEO abnormal return(365mm)	**0.0003**	**3.771E-4**										
	(10.79)	**(24.64)**										
CEO abnormal return(365ff)			0.0015	-0.0100								
			(0.03)	(-0.46)								
CEO raw return(365raw)					**13.0318**	**12.3858**						
					(2.02)	**(6.02)**						
CEO abnormal return(183mm)							**-0.0002**	**-4.66E-4**				
							(-4.47)	**(-37.32)**				
CEO abnormal return(183ff)									1.2685	0.9094		
									(0.64)	(1.10)		
CEO raw return(183raw)											**14.7515**	**13.8178**
											(2.34)	**(6.82)**
Size	**-3.2875**	**3.1526**	**-3.3232**	**3.1005**	**-3.4452**	**2.6739**	**-3.3152**	**3.1210**	**-3.3662**	**3.0751**	**-3.3760**	**2.8726**
	(-5.10)	**(10.44)**	**(-5.15)**	**(10.30)**	**(-5.03)**	**(9.56)**	**(-5.14)**	**(10.37)**	**(-5.24)**	**(10.22)**	**(-5.18)**	**(9.52)**
Book-to-market	**8.3351**	-0.2540	**8.3367**	-2.4300	**8.4979**	-2.9900	**8.3353**	-0.2600	**8.2864**	-0.3190	**8.4265**	-0.2610
	(2.79)	(-0.30)	**(2.79)**	(-0.29)	**(2.87)**	(-0.36)	**(2.79)**	(-0.31)	**(2.78)**	(-0.38)	**(2.86)**	(-0.32)
Volatility	**430.7674**	**532.5365**	**426.9038**	**524.9873**	**383.7511**	**451.4156**	**462.8454**	**526.3493**	**432.5951**	**533.0241**	**399.1839**	**478.4343**
	(-4.82)	**(11.49)**	**(5.52)**	**(11.51)**	**(4.87)**	**(11.43)**	**(5.51)**	**(11.38)**	**(5.53)**	**(11.53)**	**(5.24)**	**(10.39)**
Dependent *t-1*	**-4.3613**		**-4.3424**		**-5.0903**		**-4.3421**		**-4.3362**		**-4.4208**	
	(-4.82)		**(-4.80)**		**(-4.86)**		**(-4.80)**		**(-4.80)**		**(-4.85)**	
Year dummy	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	10018	10525	10018	10525	10018	10525	10018	10525	10018	10525	10018	10525
R-squared	0.0844	0.0530	0.0843	0.0518	0.0961	0.1273	0.0843	0.0523	0.0845	0.0524	0.0845	0.0873

Table 3 Continued - **Panel B.1:** Firm Performance and Timing Measures: Sales only

	(1) Industry-adjusted return	(2) Average Industry-adjusted return	(3) Industry-adjusted return	(4) Average industry-adjusted return	(5) Industry-adjusted return	(6) Average industry adjusted return	(7) Industry-adjusted return	(u) Average Industry-adjusted return	(9) Industry-adjusted return	(10) Average industry-adjusted return	(11) Industry-adjusted return	(12) Average industry adjusted return
CEO abnormal return(365mm)	0.2159 (0.67)	**0.5577 (2.67)**										
CEO abnormal return(365ff)			-0.0168 (-0.83)	0.0061 (0.51)								
CEO raw return(365raw)					**10.2053 (7.94)**	**11.5194 (21.46)**						
CEO abnormal return(183mm)							**7.1537 (3.11)**	**10.8531 (9.68)**				
CEO abnormal return(183ff)									**8.5063 (3.55)**	**11.5697 (10.52)**		
CEO raw return(183raw)											**7.9137 (3.39)**	**11.0891 (10.05)**
Size	**-5.0113 (-8.74)**	**0.9543 (5.88)**	**-5.0137 (-8.74))**	**1.0178 (6.09)**	**-4.4688 (-8.02)**	**1.0006 (6.76)**	**-4.7398 (-8.35)**	**1.1738 (7.27)**	**-4.7084 (-4.64)**	**1.1752 (7.24)**	**-4.7522 (-8.40)**	**1.0810 (6.73)**
Book-to-market	**5.3196 (2.11)**	**-3.3210 (-3.51)**	**5.3112 (2.10)**	**-3.3620 (-3.51)**	**5.2394 (2.10)**	**-3.9200 (-4.50)**	**5.2289 (2.07)**	**-4.0350 (-4.23)**	**5.2561 (2.08)**	**-3.8980 (-4.08)**	**5.1926 (2.06)**	**-4.1860 (-4.38)**
Volatility	**502.3876 (5.51)**	**747.5248 (21.58)**	**510.9505 (5.61)**	**788.1407 (23.25)**	**281.1929 (4.94)**	**341.3627 (10.57)**	**431.7464 (4.72)**	**589.6539 (17.51)**	**420.4148 (4.64)**	**587.7615 (17.82)**	**416.5338 (4.53)**	**572.4525 (16.73)**
Dependent *t-1*	**-3.7303 (-3.72)**		**-3.6667 (-4.80)**		**-5.3030 (-5.60)**				**-4.0004 (-4.01)**		**-3.9669 (-3.98)**	
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	15979	16343	15979	16343	15979	16343	15979	16343	15979	16343	15979	16343
R-squared	0.0622	0.1131	0.0621	0.1039	0.0773	0.2403	0.0643	0.1393	0.0653	0.1451	0.065	0.1424

Table 3 Continued - **Panel B.2:** Firm Performance and Past Return Measures: Sales only

	(1) Industry-adjusted return	(2) Average Industry-adjusted return	(3) Industry-adjusted return	(4) Average industry-adjusted return	(5) Industry-adjusted return	(6) Average industry adjusted return	(7) Industry-adjusted return	(8) Average Industry-adjusted return	(9) Industry-adjusted return	(10) Average industry-adjusted return	(11) Industry-adjusted return	(12) Average industry adjusted return
CEO abnormal return(365mm)	**0.0084**	-0.0080										
	(4.90)	(-1.62)										
CEO abnormal return(365ff)			**0.0016**	3.336E-4								
			(9.66)	(1.64)								
CEO raw return(365raw)					**14.5723**	**15.3793**						
					(11.52)	**(29.43)**						
CEO abnormal return(183mm)							0.2167	0.6749				
							(0.11)	(0.77)				
CEO abnormal return(183ff)									**3.8267**	**4.3724**		
									(2.12)	**(5.04)**		
CEO raw return(183raw)											**15.2755**	**18.1041**
											(4.22)	**(11.67)**
Size	**-5.0008**	**0.9880**	**-5.0114**	**1.0185**	**-4.4479**	**0.8581**	**-5.0132**	**1.0216**	**-4.9489**	**1.0957**	**-4.6423**	**1.0348**
	(-8.71)	**(6.04)**	**(-8,74)**	**(6.09)**	**(-8.04)**	**(6.17)**	**(-8.74)**	**(6.12)**	**(-8.61)**	**(6.59)**	**(-8.13)**	**(6.59)**
Book-to-market	**5.3076**	**-3.3460**	**5.3095**	**-3.3700**	**5.2118**	**-3.8030**	**5.3095**	**-3.3910**	**5.1530**	**-3.8410**	**5.0794**	**-4.4560**
	(2.10)	**(-3.50)**	**(2.10)**	**(-3.51)**	**(2.10)**	**(-4.79)**	**(2.10)**	**(-3.53)**	**(2.04)**	**(-3.93)**	**(2.01)**	**(-4.58)**
Volatility	**514.1119**	**779.6051**	**511.4432**	**789.3211**	**231.1634**	**266.1199**	**510.5749**	**791.1970**	**510.5984**	**790.8947**	**360.8665**	**490.1938**
	(5.64)	**(23.45)**	**(5.62)**	**(23.26)**	**(2.75)**	**(9.19)**	**(5.69)**	**(23.62)**	**(5.59)**	**(23.28)**	**(4.05)**	**(14.47)**
Dependent *t-1*	**-3.6398**		**-3.6648**		**-6.2486**		**-3.6687**		**-3.6387**		**-4.4133**	
	(-3.61)		**(-3.64)**		**(-6.63)**		**(-3.63)**		**(-3.60)**		**(-4.44)**	
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Number of observations	15979	16343	15979	16343	15979	16343	15979	16343	15979	16343	15979	16343
R-squared	0.0622	0.1052	0.0622	0.1039	0.0893	0.3220	0.0621	0.1041	0.0628	0.1111	0.0710	0.1924

Table 3 Continued - **Panel B.3:** Firm Performance and Future Return Measures: Sales only

	(1) Industry-adjusted return	(2) Average Industry-adjusted return	(3) Industry-adjusted return	(4) Average industry-adjusted return	(5) Industry-adjusted return	(6) Average industry adjusted return	(7) Industry-adjusted return	(8) Average Industry-adjusted return	(9) Industry-adjusted return	(10) Average industry-adjusted return	(11) Industry-adjusted return	(12) Average industry adjusted return
CEO abnormal return(365mm)	**-0.0076**	0.0081										
	(-4.04)	(1.69)										
CEO abnormal return(365ff)			**-0.0015**	-2.95E-4								
			(-9.77)	(-1.44)								
CEO raw return(365raw)					**-32.9700**	**-27.8710**						
					(-7.95)	**(-14.87)**						
CEO abnormal return(183mm)							**6.7311**	**9.8657**				
							(2.22)	**(8.42)**				
CEO abnormal return(183ff)									**5.9493**	**9.2180**		
									(2.27)	**(9.26)**		
CEO raw return(183raw)											**-46.2994**	**-38.9660**
											(-9.73)	**(-21.34)**
Size	**-5.0022**	**0.9864**	**-5.0116**	**1.0185**	**-5.4932**	**0.7704**	**-4.7623**	**1.1065**	**-4.9004**	**0.9795**	**-5.4169**	**0.8327**
	(-8.72)	**(6.04)**	**(-8.74)**	**(6.09)**	**(-9.44)**	**(4.78)**	**(-8.30)**	**(6.69)**	**(-8.67)**	**(6.10)**	**(-9.33)**	**(5.09)**
Book-to-market	**5.3080**	**-3.3440**	**5.3095**	**-3.3700**	**5.3222**	**-2.8170**	**5.3501**	**-3.6030**	**5.5224**	**-2.7870**	**5.3105**	**-2.8300**
	(2.10)	**(-3.50)**	**(2.10)**	**(-3.51)**	**(2.12)**	**(-3.24)**	**(2.12)**	**(-3.85)**	**(2.18)**	**(-3.00)**	**(2.10)**	**(-3.02)**
Volatility	**513.9601**	**778.8035**	**511.4358**	**789.2859**	**618.4469**	**924.0639**	**420.4224**	**572.0394**	**446.5278**	**624.1002**	**605.0467**	**906.2107**
	(5.64)	**(23.43)**	**(5.62)**	**(23.26)**	**(6.16)**	**(24.09)**	**(4.90)**	**(16.61)**	**(4.71)**	**(18.50)**	**(6.18)**	**(25.62)**
Dependent *t-1*	**-4.3613**		**-3.6647**		**-4.2317**		**-4.0047**		**-3.9526**		**-4.1920**	
	(-4.82)		**(-3.64)**		**(-4.23)**		**(-3.87)**		**(-4.08)**		**(-4.15)**	
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes
Number of observations	15979	16343	15979	16343	15979	16343	15979	16343	15979	16343	15979	16343
R-squared	0.0622	0.1054	0.0622	0.1039	0.0746	0.1692	0.0641	0.1329	0.0631	0.1214	0.0726	0.1590

Table 4: CEO Performance and Out of Sample Firm Performance

The dependent variable is annual *industry-adjusted* or *average industry-adjusted return* over the sample period and defined as in Table 2. In Panel A, the regressions are estimated only for the CEO timing measure, and in Panels B and C, the regressions are estimated for CEO past return and CEO future return measures, respectively. CEO return measures are defined in Table 1, and the other variables are defined in Table 2. In this table, the CEO measures are estimated based on trades during the first three years after the CEO's first trade. The regressions are then run on the period from the fourth year after the first trade to the year of the last trade by the CEO. Coefficients whose significance is at the 5% level or less are indicated in bold.

Panel A: Timing Measures and Out-of-Sample Firm Performance

	(1) Industry-adjusted return	(2) Average Industry-adjusted return	(3) Industry-adjusted return	(4) Average industry-adjusted return	(5) Industry-adjusted return	(6) Average industry adjusted return	(7) Industry-adjusted return	(8) Average Industry-adjusted return	(9) Industry-adjusted return	(10) Average industry-adjusted return	(11) Industry-adjusted return	(12) Average industry adjusted return
CEO abnormal return(365mm)	**-0.0051**	**-0.0050**										
	(-2.63)	**(-4.34)**										
CEO abnormal return(365ff)			-0.0275	-0.0280								
			(-0.48)	(-0.67)								
CEO raw return(365raw)					0.0812	-0.1067						
					(0.47)	(-1.58)						
CEO abnormal return(183mm)							0.1338	0.2190				
							(0.41)	(0.95)				
CEO abnormal return(183ff)									0.1392	0.0025		
									(0.43)	(1.12)		
CEO raw return(183raw)											0.1324	0.1976
											(0.41)	(0.87)
Size	**-3.2086**	0.2283	**-3.2117**	0.2262	**-3.2057**	0.2317	**-3.2029**	0.2387	**-3.2017**	0.2426	**-3.2035**	0.2363
	(-4.87)	(0.68)	**(-4.87)**	(0.67)	**(-4.86)**	(0.69)	**(-4.85)**	(0.71)	**(-4.85)**	(0.72)	**(-4.85)**	(0.70)
Book-to-market	1.9450	-0.8680	1.9359	-0.8820	1.9672	-0.8290	1.9534	-0.8510	1.9533	-0.8500	1.9534	-0.8530
	(0.71)	(-0.82)	(0.70)	(-0.83)	(0.71)	(-0.78)	(0.71)	(-0.80)	(0.71)	(-0.80)	(0.71)	(-0.81)
Volatility	**420.3520**	**547.5000**	**420.6775**	**548.4001**	**417.4995**	**543.6630**	**418.5183**	**545.2058**	**418.6940**	**545.4913**	**418.4521**	**545.1451**
	(3.95)	**(6.43)**	**(3.94)**	**(6.43)**	**(3.88)**	**(6.35)**	**(3.92)**	**(6.42)**	**(3.93)**	**(6.43)**	**(3.92)**	**(6.42)**
Dependent *t-1*	**-5.7074**		**-5.7018**		**-5.6900**		**-5.6984**		**-5.6978**		**-5.6982**	
	(-4.41)		**(-4.41)**		**(-4.39)**		**(-4.41)**		**(-4.41)**		**(-4.41)**	
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num of obs.	7910	7966	7910	7966	7910	7966	7910	7966	7910	7966	7910	7966
R-squared	0.0524	0.0533	0.0524	0.0534	0.0524	0.0534	0.0524	0.0535	0.0524	0.0536	0.0524	0.0535

Table 4 (continued) **- Panel B:** CEO Past Return Measure and Out-of-Sample Firm Performance

	(1) Industry adjusted return	(2) Average Industry-adjusted return	(3) Industry-adjusted return	(4) Average industry-adjusted return	(5) Industry-adjusted return	(6) Average industry adjusted return	(7) Industry-adjusted return	(8) Average Industry-adjusted return	(9) Industry-adjusted return	(10) Average industry-adjusted return	(11) Industry-adjusted return	(12) Average industry adjusted return
CEO abnormal return(365mm)	0.0003 (3.31)	**2.636E-4 (6.63)**										
CEO abnormal return(365ff)			0.0009 (0.43)	0.0010 (0.78)								
CEO raw return(365raw)					0.0814 (0.42)	0.0935 (0.73)						
CEO abnormal return(183mm)							-0.0646 (-0.23)	-0.0710 (-0.34)				
CEO abnormal return(183ff)									0.0568 (0.19)	0.1104 (0.51)		
CEO raw return(183raw)											0.2205 (0.63)	0.2761 (1.13)
Size	**-3.2083 (-4.87)**	0.2286 (0.68)	**-3.2101 (-4.87)**	0.2276 (0.68)	**-3.2108 (-4.89)**	0.2248 (0.67)	**-3.2114 (-4.88)**	0.2253 (0.67)	**-3.2070 (-4.42)**	0.2322 (0.69)	**-3.2071 (-4.87)**	0.2294 (0.68)
Book-to-market	1.9459 (0.71)	-0.8670 (-0.82)	1.9431 (0.71)	-0.8730 (-0.82)	1.9631 (0.71)	-0.8410 (-0.79)	1.9532 (0.71)	-0.8550 (-0.81)	1.9458 (0.71)	-0.8720 (-0.83)	1.9487 (0.71)	-0.8670 (-0.82)
Volatility	**420.2874 (3.95)**	**547.458 (6.43)**	**419.966 (3.95)**	**547.668 (6.43)**	**417.487 (3.86)**	**543.947 (6.34)**	**419.3875 (3.94)**	**546.361 (6.40)**	**419.505 (3.95)**	**546.863 (6.43)**	**417.7345 (3.92)**	**544.347 (6.42)**
Dependent *t-1*	**-5.7069 (-4.42)**		**-5.6983 (-4.41)**		**-5.6884 (-4.38)**		**-5.6980 (-4.41)**		**-5.7028 (-4.42)**		**-5.6946 (-4.40)**	
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	7910	7966	7910	7966	7910	7966	7910	7966	7910	7966	7910	7966
R-squared	0.0524	0.0533	0.0524	0.0533	0.0524	0.0534	0.0524	0.0533	0.0524	0.0533	0.0524	0.0536

Table 4 (continued) **- Panel C:** CEO Future Return Measure and Out-of-Sample Firm Performance

	(1) Industry-adjusted return	(2) Average Industry-adjusted return	(3) Industry-adjusted return	(4) Average industry-adjusted return	(5) Industry-adjusted return	(6) Average industry adjusted return	(7) Industry-adjusted return	(8) Average Industry-adjusted return	(9) Industry-adjusted return	(10) Average industry-adjusted return	(11) Industry-adjusted return	(12) Average industry adjusted return
CEO abnormal return(365mm)	**-0.0003**	**-2.5E-4**										
	(-3.30)	**(-6.61)**										
CEO abnormal return(365ff)			-0.0009	-0.0010								
			(-0.43)	(-0.78)								
CEO raw return(365raw)					0.1007	0.2251						
					(0.16)	(0.63)						
CEO abnormal return(183mm)							0.2003	0.2837				
							(0.65)	(1.52)				
CEO abnormal return(183ff)									0.1434	0.2432		
									(0.30)	(0.87)		
CEO raw return(183raw)											-0.3919	-0.2530
											(-0.42)	(-0.46)
Size	**-3.2083**	0.2286	**-3.2101**	0.2275	**-3.2028**	0.2435	**-3.2065**	0.2314	**-3.2071**	0.2328	**-3.2222**	0.2185
	(-4.87)	(0.68)	**(-4.87)**	(0.68)	**(-4.96)**	(0.72)	**(-4.86)**	(0.69)	**(-4.87)**	(0.69)	**(-4.92)**	(0.65)
Book-to-market	1.9459	-0.8670	1.9428	-0.8740	1.9533	-0.8440	1.9717	-0.8140	1.9592	-0.8310	1.9336	-0.8800
	(0.71)	(-0.82)	(0.71)	(-0.82)	(0.71)	(-0.80)	(0.72)	(-0.77)	(0.71)	(-0.78)	(0.70)	(-0.83)
Volatility	**420.2909**	**547.4609**	**419.9914**	**547.6988**	**419.5897**	**547.0665**	**417.3973**	**542.9533**	**418.8541**	**545.4084**	**419.6374**	**546.6837**
	(3.95)	**(6.43)**	**(3.95)**	**(6.43)**	**(3.95)**	**(6.43)**	**(3.90)**	**(6.35)**	**(3.92)**	**(6.40)**	**(3.95)**	**(6.42)**
Dependent *t-1*	**-5.7069**		**-5.6984**		**-5.7035**		**-5.6852**		**-5.6947**		**-5.6994**	
	(-4.42)		**(-4.41)**		**(-4.42)**		**(-4.39)**		**(-4.40)**		**(-4.41)**	
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Number of observations	7910	7966	7910	7966	7910	7966	7910	7966	7910	7966	7910	7966
R-squared	0.0524	0.0533	0.0524	0.0533	0.0524	0.0534	0.0524	0.0537	0.0524	0.0534	0.0524	0.0533