Changes in earnings announcement tone and insider sales

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ABSTRACT

The evidence from prior literature suggests that insider trading is related to firms' reported financial results and disclosure choices. I contribute to the literature by examining the association between narrative disclosure in earnings announcements and insider trading. Specifically, I hypothesize and find a positive association between changes in the optimistic tone of earnings announcements and CEOs' subsequent equity sales. In addition, I hypothesize and find that this relation is mitigated by the Sarbanes–Oxley Act and litigation risk. CEOs' financial gain from selling equity after more optimistic earnings announcements is small relative to their total compensation.

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1. Introduction

The prior literature finds that insider trading is related to financial reporting and disclosure. Specifically, insider trading is associated with reporting a loss (Aier, 2013), a break in an earnings growth string (Ke, Huddart, & Petroni, 2003), just meeting or beating analysts' forecasts (Cheng & Warfield, 2005), good news in a 10 K or 10Q filing (Huddart, Ke, & Shi, 2007), and favorable management forecasts (Noe, 1999). Cheng and Lo (2006) find that increased insider trading is associated with an increase in management forecasts, and Rogers (2008) notes that managers increase disclosure quality before selling equity. Thus, while insider trading is associated with disclosure quality and with the numerical results reported in earnings announcements, it is unclear whether insider trading is related to specific attributes of the narrative portion of earnings announcements. Thus, I contribute to the literature by investigating whether CEO equity sales are associated with changes in the optimistic tone of earnings announcements.

The change in (or unexpected) optimistic tone of earnings announcements is associated with abnormal returns around the announcement date, which indicates the market (at least partially) prices disclosure tone (Davis, Piger, & Sedor, 2012; Demers & Vega, 2011; Henry, 2008; Henry & Leone, 2010; Huang, Teoh, & Zhang, 2014).[2] Demers and Vega (2011) and Feldman, Govinharaj, Livnat, and Segal (2010) find that disclosure tone is also related to longer-window (i.e., one quarter) abnormal returns, which suggests that tone is impounded into price over time. Thus, the literature indicates that

the tone of earnings announcements provides information to market participants and that this information is impounded into stock price.

In this way, an unexpected increase in optimistic tone (e.g., lauding firm performance) increases stock price, which increases the proceeds from any subsequent equity sales. Therefore, I hypothesize a positive association between changes in optimistic tone in earnings announcements and CEOs' subsequent equity sales. I focus on insider sales (and not insider purchases) because the clear economic incentives to sell equity after more-optimistic earnings announcements provide a more powerful setting to test the relationship between earning announcement tone and CEO equity sales.

There are two alternative explanations for a positive association between changes in optimistic tone of earnings announcements and CEO equity sales. First, CEOs could increase optimistic tone to communicate positive information about their firms to market participants. CEOs could then decide to sell equity after observing a stock price increase. In other words, CEOs could decide to sell equity after a legitimately optimistic earnings announcement. This explanation is consistent with the literature that finds that CEOs benefit from timing sales after positive disclosures (e.g., Noe, 1999). Second, CEOs could have decided (or pre-contracted) before the earnings announcement to sell equity after the earnings announcement. With knowledge of a forthcoming sale, CEOs could increase the optimistic tone of their earnings announcement in an effort to increase the proceeds from their sale. Under this alternative, the increase in optimistic tone may not correspond to expectations of future firm performance, and the CEO could be trying to mislead the market, at least temporarily. This explanation is consistent with Huang et al. (2014), who find that increased optimistic tone is negatively associated with future earnings and cash flows.

The timing of the decision to sell equity is unobservable. As a result, I am unable to distinguish between the two alternative explanations. It is possible that both alternatives have validity. Therefore, I

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[2] The literature uses the terms "change," "unexpected," and "abnormal" optimistic tone. Measurement methods include a first difference, regression model residuals, and factor analysis.

focus my hypotheses and interpretations on the association, rather than on causation, between changes in optimistic tone and subsequent equity sales.[3]

I expect two factors to mitigate the positive association between changes in optimistic tone and CEO equity sales. First, the Sarbanes–Oxley Act of 2002 (SOX) was intended to improve the overall transparency and reliability of financial reporting, including insider trading. For example, Brochet (2010) finds less information-based insider trading after SOX. Therefore, I hypothesize that a positive association between changes in earnings announcement optimistic tone and CEO equity sales is weaker after the passage of SOX. Second, Rogers, Van Buskirk, and Zechman (2011) find that unusually optimistic earnings announcements are positively related to shareholder class action lawsuits. To reduce litigation risk, firms could write less-optimistic earnings announcements or sell less equity after the optimistic announcement. Therefore, I hypothesize that the positive relationship between changes in optimistic tone and CEO equity sales is weaker for firms that face a higher litigation risk.

I conduct my tests using approximately 20,000 firm-quarter observations from 1998 to 2007. The results support the hypotheses. Specifically, I find a positive association between changes in the optimistic tone of earnings announcements and CEOs' subsequent equity sales and that both SOX and litigation risk mitigate this relation. I compute the direct financial gain to CEOs from selling equity after a more-optimistic earnings announcement and find that it is small relative to their total compensation.

My paper makes several contributions to the literature. First, I contribute to the insider trading literature by showing that insider sales are related to changes in optimistic tone of earnings announcements. This complements prior literature that finds that insider trading is associated with the numerical results in the earnings announcement (Aier, 2013; Cheng & Warfield, 2005; Ke et al., 2003) and overall disclosure quality (Rogers, 2008).

Second, I contribute to the narrative disclosure and textual analysis literature by examining how changes in earnings announcement tone relate to the real economic activities of firm managers. Specifically, I document that changes in optimistic tone are related to individual managers' specific transactions (e.g., CEO sales) in addition to firm performance (Davis et al., 2012) and firm-level transactions, such as mergers and acquisitions and seasoned equity offerings (Huang et al., 2014).

2. Literature review and hypothesis development

There is extensive insider trading literature in finance and accounting. One line of literature concerns whether insiders trade on their private information and, if so, what information (Lakonishok & Lee, 2001). Another stream of research focuses on non-information motivations for trading, including diversification, behavior biases, and taxes (e.g., Jin & Kothari, 2008). For this paper, the most pertinent research is that which concerns the relationship between insider trading and executives' disclosure and reporting choices.

Prior evidence suggests that managers' insider trading is associated with several financial reporting outcomes. Specifically, managers time their trades to reduce litigation risk while increasing proceeds from equity sales. Aier (2013) notes that managers decrease selling prior to reporting a loss as a means to reduce litigation risk. Ke et al. (2003) find that executives use their knowledge of a forthcoming break in a string of earnings growth to sell equity several quarters prior to the break, while Huddart et al. (2007) find that executives trade after earnings announcements but before the 10 K or 10Q is released. Bergstresser

and Philippon (2006) and Bartov and Mohanram (2004) state that CEOs sell more equity after managing earnings upward, while Cheng and Warfield (2005) find a positive association between insider sales and just meeting or beating analysts' forecasts.

In addition, insider trading is associated with changes in disclosure. Noe (1999) finds that managers profit from selling after good news management forecasts. Cheng and Lo (2006) build on Noe (1999) by modeling management forecasts and insider trading as endogenously determined activities. Cheng and Lo (2006) find that increased insider trading is associated with an increase in management forecasts. Rogers (2008) finds an increase in disclosure quality before CEOs sell equity and interprets the increased quality as an effort to reduce litigation risk. In addition, Rogers uses the change in liquidity of a firm's stock as a measure of disclosure quality. He does not, however, specify what information contributes to the change in liquidity.

In sum, the evidence suggests that insider trading is associated with the decision to disclose information (i.e., make an earnings forecast) and overall disclosure quality and that CEOs time their sales to occur before reporting bad news (i.e., a loss) and after reporting good news (i.e., beating analysts' forecasts). Given that mangers' trades are associated with the reported numbers in earnings announcements and with firm disclosure activities, it is plausible that CEO equity sales are associated with the manner in which earnings announcements are written.

The literature finds that increased optimistic tone in earnings announcements is associated with abnormal returns around the announcement date (Davis & Tama-Sweet, 2012; Davis et al., 2012; Demers & Vega, 2011; Henry, 2008; Henry & Leone, 2010; Huang et al., 2014). Demers and Vega (2011) find that the unexpected optimistic tone of the earnings announcement is associated with abnormal returns over the subsequent quarter. They interpret their finding as indicating that the "soft" information captured by the optimistic tone of the earnings announcement takes longer to be impounded into price than do numerical data. Feldman et al. (2010) find similar results for the unexpected tone in the Management Discussion and Analysis section of 10 K and 10Q filings. In sum, the literature suggests that the market reaction to changes in optimistic tone follows a similar pattern to the market reaction to unexpected earnings in that there is a reaction at the announcement date followed by a drift over the subsequent quarter.

The implication of the findings in prior research is that managers can sell their equity at a higher price if they sell after an earnings announcement that uses more-optimistic language, even after controlling for the earnings surprise and other quantitative information in the announcement. In addition, trading after the earnings announcement reduces the legal liability related to accusations of illegal insider trading (Huddart et al., 2007). Given these incentives to sell equity after more-optimistic tone in earnings announcements, I test the following hypotheses, stated in the alternative form:

H1. There is a positive association between changes in the optimistic tone of earnings announcements and CEOs' subsequent equity sales.

SOX was generally intended to improve the transparency and reliability of financial reporting. The evidence on the extent to which SOX was successful in this regard is mixed (Chang, Tang, & Krivogorsky, 2011; Cianci, Fernando, & Werner, 2011; Parker, Swanson, & Dugan, 2011). Brochet (2010) finds a larger market reaction to insider trades after SOX. He attributes these results to the SOX requirement that insider trades be reported to the SEC within two days of the transaction. This finding suggests that the transparency of insider trading has improved after SOX.

In addition, Section 302 of SOX requires CEO and CFO certification of periodic reports (including audited financial statements) filed with the SEC. The personal liability created by certification may have led CEOs and CFOs to be more risk averse in all financial reporting and

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[3] In untabulated results, the correlation between changes in optimistic tone and future ROA is positive when CEOs do not sell equity but insignificant when CEOs do sell equity. This finding lends credence to the second alternative.

disclosure choices, including the amount of optimism expressed earnings announcements. Thus, my second hypothesis is:

H2. SOX mitigates the positive association between changes in the optimistic tone of earnings announcements and CEOs' subsequent equity sales.

The literature indicates that overly optimistic disclosures lead to an increased probability of class action litigation against the firm. Rogers et al. (2011) find that firms subject to shareholder class action litigation had unusually optimistic earnings announcements and that the earnings announcement optimism was often cited by the plaintiffs as evidence of misleading disclosure, particularly when followed by large insider sales. A rational response to the threat of this type of litigation is to reduce the optimistic language in earnings announcements.[4] Thus, my third hypothesis is:

H3. Litigation risk mitigates the positive association between changes in the optimistic tone of earnings announcements and CEOs' subsequent equity sales.

3. Measuring tone and sample selection

I measure optimistic tone using DICTION 5.0, an established text-analysis software program (Hart, 2000, 2001). DICTION has been used in accounting research (Davis & Tama-Sweet, 2012; Davis et al., 2012; Demers & Vega, 2011; Rogers et al., 2011) and in related settings.[5] DICTION contains over 10,000 words categorized in 35 dictionaries (i.e., word lists) based on linguist theory (Hart, 2000, 2001). A dimension or attribute of language (e.g., optimistic tone) is represented by the words in several dictionaries and is measured by computing the percentage of words in a document related to that dimension. DICTION measures optimistic tone as the percentage of optimistic words less the percentage of pessimistic words in a document. Consistent with the literature (Davis et al., 2012; Demers & Vega, 2011; Rogers et al., 2011), I use this method to measure optimistic tone in firms' earnings announcements and term this variable *DICTION_PR*.

DICTION has two primary strengths as a research tool. First, because it performs text analysis based on pre-set search rules and word dictionaries, DICTION is free from researcher subjectivity and potential bias. Second, DICTION allows for analysis of a large number of observations relative to manually reading documents and coding language attributes. The primary weakness in this approach to text analysis is the inability to account for context. For example, DICTION would count a double negative as two pessimistic words, when the intent of the language is positive. While it adds noise to my measure of tone, this is unlikely to systematically bias the results of this study.

A specific critique of DICTION is that the dictionaries of optimistic and pessimistic words, while appropriate for general discourse, do not apply to financial reporting and disclosure. Henry (2008) developed optimistic and pessimistic word lists specifically for earnings announcements. Henry and Leone (2010) provide evidence that the Henry (2008) word list outperforms word lists from DICTION and *General Inquirer* in predicting short window abnormal returns.[6] I compute *HL_PR*, a measure of optimistic tone using the Henry and Leone (2010) method, and conduct all my tests using this measure in addition to the DICTION measure.

I obtain accounting variables from Compustat, returns data from the Center for Research on Security Prices (CRSP), analysts' forecasts and earnings surprise data from the Institutional Brokers Estimate System (I/B/E/S), and CEO insider trading data from the Thompson Reuters insider filings database. A "CEO equity sale" firm-quarter is comprised of the financial variables for quarter (t), the optimistic tone of the earnings announcement related to quarter (t), and an equity sale within 45 days of the announcement date.[7] A "control" firm quarter is comprised of the financial variables and the optimistic tone from the corresponding earnings announcement for quarter (t) but with no equity sale. Panel A in Table 1 presents the sample selection procedure, and Panel B shows the number of CEO equity sale observations and control observations per year.

4. Research design

The primary research question that I investigate is whether changes in the optimistic tone of earnings announcements are associated with CEOs' equity sales. I employ the change in optimistic tone of the earnings announcement from quarter (t-1) to quarter (t) to proxy for the unexpected or abnormal portion of optimistic tone. Earnings announcements are the product of investor relations, legal, accounting, and senior manager input and, therefore, tend to be formulaic.[8] Given the formulaic nature of earnings announcements, using a simple first differences model to capture unexpected optimistic tone makes intuitive and economic sense and has been validated empirically. Demers and Vega (2011) find that the tone of the previous earnings announcement predicts the tone in the current quarter more accurately than do more complicated regression models.[9]

Li (2010) and Huang et al. (2014) utilize empirical models of the level of optimistic tone in earnings announcements. Their models capture the numerical information suggested by the National Investor Relations Institute (NIRI) and other numerical information likely known by investors at the time of the press release.[10] I develop my model based on Li (2010) and Huang et al. (2014) but use a change specification instead of levels and include an indicator variable for CEO equity sales. I run the following pooled regression:

$$
\begin{aligned}
\Delta OPTIMISM\_PR_{it} = {} & a + b_1 SALE_{it} + b_2 \Delta ROA_{it} + b_3 RETURN_{it} \\
& + b_4 SD\_ROA_{it} + b_5 SD\_RET_{it} + b_6 LOSS_{it} \\
& + b_7 MISS_{it} + b_8 SI\_DUM_{it} + b_9 \Delta ACCR_{it} + b_{10} \Delta SIZE_{it} \\
& + b_{11} \Delta LEVERAGE_{it} + b_{12} \Delta MTB_{it} + b_{13} \Delta BUSSEG_{it} \\
& + b_{14} \Delta GEOSEG_{it} + \Sigma_j b_{15j} QTR_{itj} + \Sigma_k b_{16k} YEAR_{itk} \\
& + \Sigma_l b_{17l} INDUSTRY_{itl} + e
\end{aligned}
\tag{1}
$$

$\Delta OPTIMISM\_PR$ is measured as the optimistic tone in the earnings announcement in quarter (t) less the optimistic tone in the earnings announcement in quarter ($t-1$). I measure optimistic tone using both the DICTION word list and the Henry and Leone (2010) word list and

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[4] In a similar setting, Nelson and Pritchard (2007) find that firms with higher ex-ante litigation risk write the MD&A in annual reports, using more cautionary language to reduce the expected costs of litigation.

[5] Yuthas, Rogers and Dillard (2002) study annual reports, Ober, Zhao, Davis, and Alexander (2001) examine general business communication, and Cho, Roberts and Patten (2009) investigate corporate environmental disclosures.

[6] General Inquirer is a text analysis program and word list that has been used in accounting research by Kothari, Li, and Short (2009) and Twedt and Rees (2012), among others.

[7] If there are multiple equity sales within 45 days of the earnings announcement, I sum the sales and treat them as one observation with a sale date of the day of the first sale.

[8] I make this assertion based on my discussions with practitioners, anecdotal evidence, and empirical research (Demers & Vega, 2011). For example, the original Google press release for Q3 on Oct. 18, 2012, accidentally included a placeholder for "Pending Larry Quote [CEO Larry Page]." http://money.cnn.com/2012/10/18/technology/google-earnings/index.html.

[9] I explore other measures of unexpected optimistic one in my sensitivity tests.

[10] The NIRI best-practices guidelines specify that press releases include current period income under Generally Accepted Accounting Principles and "should ordinarily include analyses of operating results and a discussion of both positive and negative factors significantly affecting revenue, profitability and other key financial indicators that measure the health of the enterprise (e.g., debt to equity ratios, etc.)" (NIRI, 2001).

Table 1
Sample selection.

Panel A: Data collection process	
1998–2007 press releases from *PR Newswire* and *10 K Wizard*	45,531
Less observations missing financial variables	(25,376)
Total firm-quarter observations	20,155
CEO equity sale observations	4,928
Control observations	15,227

Panel B: Firm-quarter observations per year			
Year	Sale	Control	Total
1998	52	214	266
1999	266	1,258	1,524
2000	286	1,208	1,494
2001	339	1,338	1,677
2002	358	1,581	1,939
2003	395	1,447	1,842
2004	842	2,299	3,141
2005	1,039	2,735	3,744
2006	1,019	2,653	3,672
2007	332	494	826
Total	4,928	15,227	20,155

Table 2
Summary statistics.

Variable	Mean	Median	SD	Min	Max
DICTION_PR	0.758	0.680	0.677	−0.620	2.960
ΔDICTION_PR	−0.011	0.000	0.467	−1.340	1.360
HL_PR	0.461	0.494	0.260	−0.279	0.966
ΔHL_PR	−0.005	0.000	0.201	−0.616	0.573
SALE	0.245	0.000	0.430	0.000	1.000
ΔROA	0.000	0.000	0.019	−0.080	0.081
RETURN	0.176	0.112	0.476	−0.692	2.270
SD_ROA	0.019	0.011	0.024	0.000	0.155
SD_RET	0.025	0.023	0.012	0.009	0.070
LOSS	0.128	0.000	0.333	0.000	1.000
MISS	0.252	0.000	0.434	0.000	1.000
SI_DUM	0.296	0.000	0.456	0.000	1.000
ΔACCR	0.000	−0.001	0.048	−0.170	0.173
ΔSIZE	135.0	33.05	1,559.3	−6,576.9	8,607.9
ΔLEVERAGE	0.000	−0.002	0.032	−0.105	0.146
ΔMTB	−0.045	−0.001	0.923	−4.565	3.668
ΔBUSSEG	0.110	0.000	1.208	−9.000	11.000
ΔGEOSEG	0.063	0.000	0.962	−12.000	18.000
HIGH_LIT	0.359	0.000	0.479	0.000	1.000
CAR_SALE	0.026	0.018	0.090	−0.193	0.336

Correlation coefficients are listed on the first line; (*p*-values) are listed on the second line. For complete variable definitions see Appendix A.

methodology and, thus, use *ΔDICTION_PR* and *ΔHL_PR* as dependent variables in all of my tests.[11] *SALE* is an indicator variable equal to 1 if the CEO sold equity within 45 days of the earnings announcement.[12] H1 predicts a positive coefficient on *SALE*, which indicates a positive association between changes in optimistic tone and subsequent equity sales.

The model controls factors that the literature has found to be associated with earnings announcement tone. In other words, the control variables are items that firms are likely to discuss in their earnings announcement. *ΔROA*, *RETURN*, *MISS*, and *LOSS* control for firm performance, while *SD_ROA* and *SD_RET* control for the variability of firm performance. *SI_DUM* is an indicator that controls for special items, while *ΔACCR* captures changes in accruals. *ΔSIZE*, *ΔLEVERAGE*, and *ΔMTB* are included, as changes in size, leverage, or the market-to-book ratio would likely be discussed in the press release. Changes in firms' product markets or geographic areas are captured by *ΔBUSSEG* and *ΔGEOSEG*. Finally, there are indicators for quarter, year, and industry.

H2 predicts that SOX mitigates the positive association between changes in tone and subsequent equity sales. To test these hypotheses, I include a post-SOX indicator variable and interact the indicator with *SALE*. H2 predicts a negative coefficient on *SALE* ∗ *POST-SOX*. H3 predicts that litigation risk mitigates the positive association between increase in optimistic tone and equity sales. To test this hypothesis, I include a high litigation risk indicator (*HILIT*) from Rogers et al. (2011) and interact *HILIT* with *SALE*. The coefficient on *SALE* ∗ *HILIT* provides evidence for H3.

I next examine the extent to which abnormal returns from the earnings announcement until the CEO equity sale are related to changes in optimistic tone. I use the resulting coefficient to compute CEOs' financial gains from selling equity after more-optimistic press releases. My model, derived from Davis et al. (2012), controls for factors found in prior research that relate to abnormal returns around the earnings announcement.

$$CAR\_SALE_{it} = a + b_1 \Delta OPTIMISM\_PR_{it} + b_2 SURP_{it} + b_3 BEAT_{it}$$
$$+ b_4 LOSS_{it} + \Sigma_j b_{5j} QTR_{itj} + \Sigma_k b_{6k} YEAR_{itk} \qquad (2)$$
$$+ \Sigma_l b_{17l} INDUSTRY_{itl} + e$$

CAR_SALE is the cumulative abnormal return from one day before the earnings press release until the CEO sells equity. Each daily return

is adjusted by the return of a matched size and book-to-market portfolio. As in Eq. (1), I measure *ΔOPTIMISM_PR* using both *ΔDICTION_PR* and *ΔHL_PR*. All other variables are previously defined.

5. Empirical results

Table 2 presents the summary statistics for the dataset. All continuous variables have been winsorized at the 1% level. The mean *ΔDICTION_PR* (*ΔHL_PR*) is −0.011 (−0.005), which indicates that changes in tone are slightly pessimistic on average.[13] This is surprising, given that only 12.8% of firm-quarters report a loss (*LOSS* = 1) and that firms miss analysts' earnings expectations 25.2% of the time (*MISS* = 1). I find CEO equity sales in 24.5% of firm-quarters (*SALE* = 1).

A correlation matrix, presented in Table 3, provides initial evidence for the relation between equity sales and changes in optimistic tone. The correlation between *ΔDICTION_PR* (*ΔHL_PR*) and *SALE* is small but statistically significant, with a coefficient of 0.013 (0.028) and a *p*-value of 0.017 (0.000). This provides univariate support for H1.

Table 4 presents the results of the first set of multivariate tests. *ΔDICTION_PR* is the dependent variable in column (1), and *ΔHL_PR* is the dependent variable in column (2). H1 predicts a positive coefficient on *SALE*. In column (1), the coefficient on *SALE* is 0.013, with a *p*-value of 0.093, and, in column (2), the coefficient on *SALE* is 0.007, with a *p*-value of 0.037.[14] This evidence supports the prediction in H1 that increases in optimistic tone are associated with subsequent equity sales. In both models, *ΔROA* and *ΔMTB* are positively related to changes in tone, while *MISS* and *ΔACCR* are negatively related to changes in tone. Thus, the evidence in Table 4 suggests that the association between increases in optimistic tone and CEOs' subsequent equity sales has incremental explanatory power beyond firm performance and key financial indicators.

H2 predicts that SOX mitigates the association between changes in earnings announcement tone and subsequent equity sales. As seen in Table 5, the coefficients on *SALE* are positive and the coefficients on *SALE* ∗ *POST-SOX* are negative, which provides support for H2. When *ΔDICTION_PR* is the dependent variable, the coefficient on *SALE* is 0.041 (*p*-value of 0.010), and the coefficient on *SALE* ∗ *POST-SOX* is −0.039 (*p*-value of 0.031). When *ΔHL_PR* is the dependent variable, the

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[11] For complete variable definitions, see the Appendix A.
[12] I examine alternate sales windows in my sensitivity tests.

[13] The mean level of optimistic tone measured by *DICTION_PR* (*HL_PR*) is 0.758 (0.461), which indicates that the average press release is more optimistic than pessimistic.
[14] All *p*-values based on two-tailed levels of significance.

Table 3
Correlations.

	ΔDICT_PR	ΔHL_PR	ΔROA	SALE	POST_SOX	HIGH_LIT	CAR_SALE
ΔDICTION_PR	1.000						
	(0.000)						
ΔHL_PR	0.278	1.000					
	(0.000)						
ΔROA	0.055	0.082	1.000				
	(0.000)	(0.000)					
SALE	0.017	0.028	0.015	1.000			
	(0.013)	(0.000)	(0.035)				
POST_SOX	0.005	0.034	0.013	0.085	1.000		
	(0.473)	(0.000)	(0.067)	(0.000)			
HIGH_LIT	−0.006	−0.009	0.006	0.014	−0.010	1.000	
	(0.365)	(0.233)	(0.391)	(0.054)	(0.148)		
CAR_SALE	0.034	0.040	0.106	−0.010	−0.100	0.043	1.000
	(0.009)	(0.005)	(0.000)	(0.463)	(0.000)	(0.001)	

Correlation coefficients are listed on the first line; (*p*-values) are listed on the second line. For complete variable definitions see Appendix A.

coefficient on *SALE* is 0.019 (*p*-value of 0.006), and the coefficient on *SALE* ∗ *POST-SOX* is −0.017 (*p*-value of 0.033).

Next, I conduct an *F*-test to examine the joint significance of *SALE* and *SALE* ∗ *POST-SOX*. The results (untabulated) are not significant for either specification. Collectively, these results support H2 and suggest that SOX eliminated the positive association between changes in optimistic tone and CEOs' subsequent equity sales.

H3 predicts that litigation risk reduces the association between increases in earnings announcement tone and CEOs' subsequent equity sales. The results of testing H3 are presented in Table 6. The coefficients on *SALE* and *SALE* ∗ *HILIT* provide mixed support for H3. When ΔDICTION_PR is the dependent variable, the coefficient on *SALE* is 0.024 (*p*-value of 0.018), and the coefficient on *SALE* ∗ *HILIT* is −0.028 (*p*-value of 0.077). However, when ΔHL_PR is the dependent variable, the coefficient on *SALE* is 0.008 (*p*-value of 0.082), but the coefficient

Table 4
Optimistic tone and CEO equity transactions.

	Prediction	(1) ΔDICTION_PR	(2) ΔHL_PR
SALE	+	0.013*	0.007**
		(0.093)	(0.037)
ΔROA		1.372***	0.918***
		(0.000)	(0.000)
RETURN		0.003	0.027***
		(0.688)	(0.000)
SD_ROA		0.078	−0.070
		(0.593)	(0.351)
SD_RET		−0.044	−0.245
		(0.917)	(0.247)
LOSS		0.004	0.020***
		(0.701)	(0.001)
MISS		−0.056***	−0.036***
		(0.000)	(0.000)
SI_DUM		−0.008	−0.005
		(0.298)	(0.200)
ΔACCR		−0.190**	−0.096***
		(0.010)	(0.007)
ΔSIZE		−0.000	0.000
		(0.878)	(0.584)
ΔLEVERAGE		−0.019	0.141***
		(0.859)	(0.006)
ΔMTB		0.012***	0.004**
		(0.004)	(0.028)
ΔBUSSEG		−0.002	−0.001
		(0.444)	(0.360)
ΔGEOSEG		0.001	0.000
		(0.731)	(0.970)
Quarter & year		Included	Included
Industry		Included	Included
Constant		0.035	−0.080*
		(0.547)	(0.060)
Observations		20,155	16,669
Adjusted R²		0.010	0.033

Robust *p*-values in parentheses, based on Huber–White adjusted standard errors. For complete definitions see Appendix A.
 * Indicates significance at 10% level based on two-tailed tests.
 ** Indicates significance at 5% level based on two-tailed tests.
*** Indicates significance at 1% level based on two-tailed tests.

Table 5
The Impact of SOX on Optimistic Tone and Equity Transactions.

	Prediction	(1) ΔDICTION_PR	(2) ΔHL_PR
SALE	+	0.041***	0.019***
		(0.010)	(0.006)
SALE ∗ POST-SOX	−	−0.039**	−0.017**
		(0.031)	(0.033)
POST-SOX		−0.002	0.050***
		(0.954)	(0.001)
ΔROA		1.372***	0.919***
		(0.000)	(0.000)
RETURN		0.002	0.026***
		(0.754)	(0.000)
SD_ROA		0.076	−0.070
		(0.603)	(0.348)
SD_RET		−0.052	−0.251
		(0.902)	(0.236)
LOSS		0.004	0.020***
		(0.703)	(0.001)
MISS		−0.056***	−0.036***
		(0.000)	(0.000)
SI_DUM		−0.008	−0.005
		(0.294)	(0.198)
ΔACCR		−0.188**	−0.096***
		(0.011)	(0.007)
ΔSIZE		−0.000	0.000
		(0.851)	(0.609)
ΔLEVERAGE		−0.019	0.141***
		(0.859)	(0.006)
ΔMTB		0.012***	0.004**
		(0.003)	(0.026)
ΔBUSSEG		−0.002	−0.001
		(0.419)	(0.335)
ΔGEOSEG		0.001	0.000
		(0.738)	(0.971)
Quarter & year		Included	Included
Industry		Included	Included
Constant		0.031	−0.082*
		(0.602)	(0.053)
Observations		20,155	16,669
Adjusted R²		0.010	0.033

Robust *p*-values in parentheses, based on Huber–White adjusted standard errors. For complete definitions see Appendix A.
 * Indicates significance at 10% level based on two-tailed tests.
 ** Indicates significance at 5% level based on two-tailed tests.
*** Indicates significance at 1% level based on two-tailed tests.

Table 6
The impact of litigation risk on optimistic tone and equity sales.

	Prediction	(1) ΔDICTION_PR	(2) ΔHL_PR
SALE	+	0.024**	0.008*
		(0.018)	(0.082)
*SALE * HILIT*	−	− 0.028*	− 0.001
		(0.077)	(0.882)
HILIT		0.007	0.031
		(0.898)	(0.440)
ΔROA		1.371***	0.918***
		(0.000)	(0.000)
RETURN		0.003	0.027***
		(0.665)	(0.000)
SD_ROA		0.090	− 0.069
		(0.537)	(0.355)
SD_RET		− 0.048	− 0.245
		(0.909)	(0.247)
LOSS		0.004	0.020***
		(0.714)	(0.001)
MISS		− 0.056***	− 0.036***
		(0.000)	(0.000)
SI_DUM		− 0.008	− 0.005
		(0.289)	(0.199)
ΔACCR		− 0.189**	− 0.096***
		(0.011)	(0.007)
ΔSIZE		− 0.000	0.000
		(0.883)	(0.584)
ΔLEVERAGE		− 0.018	0.141***
		(0.868)	(0.006)
ΔMTB		0.012***	0.004**
		(0.004)	(0.028)
ΔBUSSEG		− 0.002	− 0.001
		(0.447)	(0.360)
ΔGEOSEG		0.001	0.000
		(0.736)	(0.970)
Quarter & year		Included	Included
Industry		Included	Included
Constant		0.035	− 0.080*
		(0.553)	(0.060)
Observations		20,155	16,669
Adjusted R^2		0.011	0.033

Robust *p*-values in parentheses, based on Huber–White adjusted standard errors. For complete definitions see Appendix A.
* Indicates significance at 10% level based on two-tailed tests.
** Indicates significance at 5% level based on two-tailed tests.
*** Indicates significance at 1% level based on two-tailed tests.

on *SALE * HILIT* is − 0.001 (*p*-value of 0.882), which does not support H3. Next, I conduct an *F*-test to examine the joint significance of *SALE* and *SALE * HILIT*. The results (untabulated) are not significant for either specification, which suggests that, for high litigation risk firms, there is no association between changes in optimistic tone and CEO equity sales.

To quantify CEOs' gains from selling equity after increased optimism in earnings announcements, I follow Eq. (2) and regress *CAR_SALE* against unexpected optimistic tone and a series of control variables. The untabulated results are consistent with prior literature (i.e., Davis et al., 2012; Huang et al., 2014), which finds that unexpected tone is related to abnormal returns. The coefficient (*p*-value) on *ΔDICTION_PR* is 0.006 (0.047), and the coefficient (*p*-value) on *ΔHL_PR* is 0.019 (0.015).

A coefficient on *ΔDICTION_PR* of 0.006 implies that a one-unit change in *ΔDICTION_PR* corresponds to a 60-basis point increase in the abnormal return from the earnings announcement to the equity sale. An increase of one standard deviation in *ΔDICTION_PR* is 0.467, which implies a 28-basis point increase in the abnormal return. While not large in absolute value, this is material compared to the mean (median) abnormal return from the earnings announcement to the equity sale of 260 (180) basis points. For the firm-quarters in which CEOs sell equity, the mean value of the sale is $7.04 million. However, because open market purchases of equity often occur in the same quarter, I compute the net dollar value of equity sales (sales minus purchases) as $4.81 million. A 28-basis point increase in the stock price increases equity sale proceeds by about $13,500. Using the *ΔHL_PR* coefficient and standard deviation yields an increase of about 38 basis points and an increase in equity sale proceeds of about $18,000.

Taken together, I interpret my results to support the hypothesis of a positive association between an increase in optimistic tone in earnings announcements and CEOs' subsequent equity sales. The resulting increase in CEOs' wealth is small compared to their total compensation. However, the evidence suggests that CEOs are aware of the tone in their earnings announcements and to the market response to the tone when they sell equity.

6. Sensitivity tests

The short-run market reaction to an unexpected optimistic tone in earnings announcements found in the literature (e.g., Davis et al., 2012; Demers & Vega, 2011; Huang et al., 2014) suggests that CEOs may benefit from transactions that occur soon after the announcement date. I repeat my tests after restricting equity sales to those that occur within 30 days of the announcement date. The results are similar to those tabulated. I also find similar results using CEO sales within 90 days of the earnings announcement.

Next, I explore alternative measures of equity sales. In my tabulated tests, a "CEO equity sale quarter" is a quarter in which the CEO sells equity, with no restrictions regarding equity purchases. I repeat my analyses and find similar results when I define a CEO equity sale quarter as a quarter in which the CEO makes an equity sale but no equity purchases or when I define a CEO equity sale quarter as a quarter in which CEO equity sales are greater than equity purchases.

I also consider an alternative method of computing changes in optimistic tone. Specifically, I measure optimistic tone using the word list developed by Henry (2008) but employ the computational approach from DICTION instead of from Henry and Leone (2010). The results are consistent with those reported for *ΔDICTION_PR* for all three hypotheses, and inferences remain unchanged.

Next, to ensure that the results are not driven by a potentially mis-specified expectations model, I examine an alternate measure of unexpected optimistic tone. I implement a determinants model of tone using levels of tone as the dependent variable, similar to Li (2010) and Huang et al. (2014), and use the residual from the regression model and a measure of unexpected tone, as done by Huang et al. (2014). When I use this measure of unexpected optimistic tone, instead of changes in tone, the results are similar to those presented in the tables.

Finally, the computations of CEOs' financial gain are based on measuring abnormal returns using size and book-to-market adjusted returns. I repeat my analyses using a market model to compute abnormal returns and find similar results to those tabulated. I also find similar results when computing the economic benefit to CEOs based on the three-day cumulative abnormal return around the earnings announcement instead of abnormal returns from the earnings announcement to the equity sale.

7. Conclusion

In this paper, I investigate the association between changes in the optimistic tone of earnings announcements and CEOs' equity sales. Using a sample of approximately 20,000 firm-quarters from 1998 to 2007, I find a positive relation between changes in earnings announcement tone and CEO equity sales. The positive relation is mitigated by SOX and by litigation risk. Consistent with the literature, I also find a positive relation between changes in optimistic tone in earnings announcements and abnormal returns. I use this relation to compute CEOs' gain from selling equity after more-optimistic earnings announcements and find that it is small relative to the total CEO compensation.

My study makes a contribution to several streams of literature. The literature shows that insider trading is related to the propensity of managers to make earnings forecasts (Cheng & Lo, 2006), overall disclosure quality (Rogers, 2008), and the numerical results reported in the earnings announcement (Aier, 2013; Cheng & Warfield, 2005). My findings extend the literature by documenting that a specific aspect of narrative disclosure (the optimistic tone of the earnings announcement) is associated with CEO equity sales.

In addition, I contribute to the narrative disclosure and textual analysis literature by documenting that changes in tone are related to individual executives' economic transactions. This complements the findings of Huang et al. (2014), who find that earnings announcement tone is positively related to future firm-level transactions, such as mergers and equity offerings, and Davis et al. (2012), who find a positive relation between optimistic tone and future firm performance.

Acknowledgments

Appendix A. Complete Variable Definitions

DICTION_PR   Optimistic tone based on DICTION 5.0 word lists and measured as the percentage of optimistic words less the percentage of pessimistic words.

ΔDICTION_PR   DICTION_PR in quarter (t) minus quarter $(t-1)$.

HL_PR   Optimistic tone as measured by Henry and Leone (2010) using the word list from Henry (2008) and computed as (optimistm − pessimis) / (optimism + pessimism).

ΔHL_PR   HL_PR in quarter (t) minus quarter $(t-1)$.

SALE   Indicator variable equal to 1 if the CEO sold equity within 45 days of the earnings announcement.

ΔROA   ROA of quarter (t) minus ROA of quarter $(t-1)$.

RETURN   Raw returns over the prior year.

SD_ROA   Standard deviation of quarterly ROA over the prior 5 years.

SD_RET   Standard deviation of daily returns over the prior year.

LOSS   Indicator variable equal to 1 if the firm made a loss.

MISS   Indicator variable equal to 1 if the firm missed the consensus analyst forecast (actual earnings less median forecast in I/B/E/S).

SI_DUM   Indicator variable equal to 1 if the firm records a special item (litigation cost, goodwill impairment, restructuring, writedown, or other special item: GDWILIPQ, SETPQ, RCPQ, WDPQ,SPIOQ).

ΔACCR   The quarterly change in accruals measured as income before extraordinary items − cash flow from operation scaled by average assets ((IBQ-Net OANCFY)/((ATQ + ATQ$_{t-1}$)/2)).

ΔSIZE   The quarterly change in the market value of common stock.

ΔLEVERAGE   The quarterly change in debt to assets (LTQ/ATQ).

ΔMTB   The quarterly change in market to book value of common stock ((CEQQ*PRCCQ)/CSHOQ) both measured at quarter end.

ΔBUSSEG   The annual change in the number of business segments.

ΔGEOSEG   The annual change in the number of geographic segments.

HIGH_LIT   Firms in SIC 28, 36, 38, 63, and 73 from Rogers et al. (2011).

CAR_SALE   The abnormal return from one day before the earnings announcement until the day of a CEO equity sale. Abnormal returns are computed using 25 size and book to market portfolios based on the methodology, breakpoints and return data from Ken French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library).

References

Aier, J. (2013). Insider trading in loss firms. *Advances in Accounting, 29*(1), 12–26.
Bartov, E., & Mohanram, P. (2004). Private information, earnings manipulations, and executive stock option exercises. *The Accounting Review, 79*(4), 889–920.
Bergstresser, D., & Philippon, T. (2006). CEO incentives and earnings management. *Journal of Financial Economics, 80*, 511–529.
Brochet, F. (2010). Information content of insider trades before and after the Sarbanes–Oxley Act. *The Accounting Review, 85*(2), 419–446.
Chang, J. -C., Tang, A.P., & Krivogorsky, V. (2011). The impacts of SOX and SEC investigation on the corporate governance of option backdating firms. *Advances in Accounting, 27*(2), 205–212.
Cheng, Q., & Lo, K. (2006). Insider trading and voluntary disclosures. *Journal of Accounting Research, 44*(4), 815–848.
Cheng, Q., & Warfield, T. (2005). Equity incentives and earnings management. *The Accounting Review, 80*(2), 441–476.
Cho, C.H., Roberts, R.W., & Patten, D.M. (2009). The language of US corporate environmental disclosure. *Accounting, Organizations and Society, 35*(6), 431–443.
Cianci, A.M., Fernando, G.D., & Werner, E.M. (2011). The differential CEO dominance-compensation and corporate governance-compensation relations: Pre- and post-SOX. *Advances in Accounting, 27*(2), 212–222.
Davis, A., Piger, J., & Sedor, L. (2012). Beyond the numbers: Measuring the information content of earnings press releases. *Contemporary Accounting Research, 29*(3), 845–868.
Davis, A., & Tama-Sweet, I. (2012). Managers' use of language across alternative disclosure outlets: Earnings press releases versus MD&A. *Contemporary Accounting Research, 29*(3), 804–837.
Demers, E., & Vega, C. (2011). Soft information in earnings announcements: News of noise? *Working Paper, INSEAD and the Federal Reserve Board.*
Feldman, R., Govinharaj, S., Livnat, J., & Segal, B. (2010). Management's tone change, post earnings announcement drift and accruals. *Review of Accounting Studies, 15*(4), 915–953.
Hart, R. (2000). *DICTION 5.0: The text-analysis program.* Thousand Oaks, CA: Scolari/Sage Publications.
Hart, R. (2001). Redeveloping DICTION: Theoretical considerations. In M. West (Ed.), *Theory, Method and Practice of Computer Content Analysis.* New York: Ablex.
Henry, E. (2008). Are investors influenced by how earnings press releases are written? *Journal of Business Communication, 45*(4), 363–407.
Henry, E., & Leone, A. (2010). Measuring qualitative information in capital markets research. *Working Paper.* University of Miami.
Huang, X., Teoh, S., & Zhang, Y. (2014). Tone management. *The Accounting Review, 89*(3), 1081–1113.
Huddart, S., Ke, B., & Shi, C. (2007). Jeopardy, non-public information, and insider trading around SEC 10-K and 10-Q filings. *Journal of Accounting and Economics, 43*, 3–36.
Jin, L., & Kothari, S.P. (2008). Effect of personal taxes on managers' decisions to sell their stock. *Journal of Accounting and Economics, 46*, 23–46.
Ke, B., Huddart, S., & Petroni, K. (2003). What insiders know about future earnings and how they use it: Evidence from insider trades. *Journal of Accounting and Economics, 35*, 315–346.
Kothari, S., Li, X., & Short, J. (2009). The effect of disclosures by management, analysts, and financial press on cost of capital, return volatility, and analyst forecasts: A study using content analysis. *The Accounting Review, 85*(4), 1639–1670.
Lakonishok, J., & Lee, I. (2001). Are insider trades informative? *Review of Financial Studies, 14*, 79–111.
Li, F. (2010). Textual analysis of corporate disclosures: A survey of the literature. *Journal of Accounting Literature, 29* (need page numbers).
National Investor Relations Institute (NIRI). Earnings Press Release Guidance. Vienna, VA, 2001.
Nelson, K., & Pritchard, A. (2007). Litigation risk and voluntary disclosure: The use of meaningful cautionary language. *Working Paper.* Rice University.
Noe, C. (1999). Voluntary disclosure and insider transactions. *Journal of Accounting and Economics, 27*, 305–326.
Ober, S., Zhao, J., Davis, R., & Alexander, M. (2001). Telling it like it is: The use of certainty in public business discourse. *Journal of Business Communication, 36*(3), 280–300.
Parker, P.D., Swanson, N.J., & Dugan, M.T. (2011). An empirical examination of the impact of the Sarbanes Oxley Act in the reduction of pension expense manipulation. *Advances in Accounting, 27*(2), 233–241.
Rogers, J. (2008). Disclosure quality and management trading incentives. *Journal of Accounting Research, 46*(5), 1265–1296.
Rogers, J., Van Buskirk, A., & Zechman, S. (2011). Disclosure tone and shareholder litigation. *The Accounting Review, 86*(6), 2155–2183.
Twedt, B., & Rees, L. (2012). Reading between the lines: An empirical examination of qualitative attributes of financial analysts' reports. *Journal of Accounting and Public Policy, 31*(1), 1–21.
Yuthas, K., Rogers, R., & Dillard, J. (2002). Communicative action and corporate annual reports. *Journal of Business Ethics, 41*, 141–157.