Is the Increase in Insider Information Confusing the Market?

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Abstract

To combat the asymmetry between insider information and investor information, the Sarbanes-Oxley Act introduced a full disclosure regulation requiring more frequent insider voluntary earnings disclosures from public traded companies. This caused managers to release much more frequent 8-K voluntary earnings disclosures (VEDs). This study examines stocks' volatility surrounding VEDs. We explore if managers can potentially use VEDs to create volatility and use arbitrage for their own and transient institutional investors' (TIIs) benefits. The study finds that market price volatility does exist during the VED event periods. The market price volatility indicates managers are using VEDs to manage earnings and as a consequence to degrade investor pricing decisions. The length of the volatility events supports managers' ability to create non-equilibrium pricing moments that benefit insider trades. However, TIIs do not see VEDs as an attractant for investment in a firm and TIIs avoid investing in companies issuing above average numbers of VEDs.

Keywords: VEDs, volatility, TIIs

I. Introduction

I.1 The motivation of the paper

Voluntary earnings disclosures (VEDs) cause 66% of investor price movements (Beyer, Cohen, Lys and Walther, 2010). Investors rely so heavily on VEDs because they see VEDs as the dominate source of public firm financial information. Beyer et al. define VEDs as firms issuing earnings guidance through conference calls or press releases between regulatory mandated earnings reports. Policy setters intuitively have concluded that companies failing to release VEDs starve the market of insider information which increased market inefficiency and volatility that damages investor returns (Verrecchia, 2001). The United States' policy makers issued Regulation Fair Disclosure (Reg. FD) and passed the Sarbanes-Oxley Act (SOX) to increase the number of VEDs managers issue. Prior to Reg. FD and SOX only 30% of publicly companies issued VEDs, but now over 80% of them issue VEDs (Bronson et al., 2011). Yet, market volatility has risen during the post-Reg. FD and post-SOX period (D'Souza, Ramesh, & Shen, 2010). The increasing market volatility during a period when more VEDs are available is the opposite of the market volatility results policy makers expected. However, research concerning the efficacy of VEDs resulting from Reg. FD and SOX is minimal as of this study.

I.2 The significance of the Study

First, this study adds to the knowledge of how managers manipulate firm-specific market prices when issuing VEDs. We demonstrate investors' reactions to VEDs cause market price volatility. This study challenges the intuition that issuing more VEDs lowers market volatility and examines why rising volatility is occurring at the same time VEDs volumes and breadth are also increasing. Understanding managerial use of VEDs will improve market analysis of the information within the VEDs and higher investor knowledge of managers' motives for VEDs will reduce the effect of VEDs on investor decisions.

Second, examining the stock price volatility using the directional movement index (DMI) allows this study to measure the pricing effect VEDs have on market volatility and provides researchers with new understanding of the incongruity of investors' uses of VEDs to make investment decisions. This study is unique from other VED research because it examines the

market price volatility surrounding the VEDs specifically filed with the SEC in compliance with Reg. FD and SOX. No other study has specifically examined this issue.

Finally, the study increases researchers' understanding of how TIIs use VEDs in their investment decisions. The study examines if managers can manipulate TII responses using VEDs or if TIIs' investment decisions ignore VEDs. The study also examines TIIs' catering as one reason for rising market volatility within an insider disclosure rich environment.

II. Literature Review and Hypotheses

II.1 Literature review

Earnings management can give managers personal benefits and can benefit shareholders (Edmans & Gabaix, 2009). Studies have shown that market volatility increases when earnings quality decreases and one method managers use to decrease earnings quality is earnings management through VEDs (Francis et al., 2007). Earnings management using VEDs must distort the true financial performance of a firm for VEDs to have a non-equilibrium effect on investor reactions. Managers partake in earnings management through varying the quality and quantity of information included in VEDs and rarely do VEDs contain full financial details of a firm's performance (D'Souza et al., 2010; Francis et al., 2008). Managers also use VEDs to release lower precision and less informative data that guides analysts to issue forecasts managers believe their companies can meet or beat (Gu & Li, 2007). Bronson et al. (2011) found that earnings revisions occurring between prior VEDs and subsequent regulatory reports have increased 35% and the failure of agreement between VEDs and subsequent regulatory reports causes investors to become confused and make errors in investor pricing.

For managers to use VEDs effectively in managing earnings, investors must persistently react to VEDs when determining market values. The heavy reliance investors place on analysts' forecasts (Lehavy, Feng, & Merkley, 2011) and the findings that VEDs effect analysts' forecasts (D'Souza et al., 2010; Gu & Li 2007) support VEDs effects on investor pricing decisions. Francis et al. (2008) find that managers using VEDs to persistently effect investor pricing decisions and to signal sophisticated investors about arbitrage periods surrounding VEDs. Investors and analysts do react to VEDs inefficiently to allow for longer, predictable arbitrage periods in the markets (D'Souza et al., 2010).

Theories explaining investors and analysts acting inefficiently when pricing the market and/or firm-specific information include over-reliance on insider information (Hribar & McInnis, 2012), habit formations (Li & Yu, 2012), and momentum (Dong, Hirshleifer, Richardson, & Teoh, 2006). Since investors must interpret new information before they can price the information, Zhang (2006) finds prices at first underreact following the release of both negative and positive VEDs. Further, Zhang demonstrates the more ambiguous the information, the longer prices take to drift to their new equilibrium levels. Managers, desiring to benefit from the drifts, can use VEDs to create ambiguity in investors pricing decisions and profit from the long period of autocorrelation the ambiguity causes. This ambiguity can create either excess price volatility that denotes overreactions (Lev & Nissim, 2006), or subdued market reactions that denote underreaction (Gu & Li, 2007). Analysts and investors tend to overreact to positive information while underreacting to negative information (Ivkovic & Jegadeesh, 2004). When investors bid prices sufficiently out of equilibrium, arbitrage opportunities occur.

II.2 Hypotheses

Research concerning the efficacy of the VEDs resulting from Reg. FD and SOX is minimal as of this study. This study challenges the intuition that VEDs improve market efficiency and lower volatility.

Hypothesis 1: Management issuing VEDs is positively associated with stock volatility.

One growing type of investor in U.S. stocks that researchers point to when analyzing the rise of poor earnings quality is Transient Institutional Investors (TIIs) (Burns et al., 2010). TIIs represent non-active owners (no board of director representation) holding reportable ownership (>5%) in a publicly traded entity (Burns, et al., 2010). Sixty percent of U.S. public firms had a reportable percentage (5% or greater) of institutional owners as of 2007 (Zouari & Rebaï, 2009). TIIs acquire large blocks of shares which creates manifest market liquidity and price demand for the stocks that they buy (Burns et al., 2010). Thus, managers motivated to maximize security values cater to TIIs to entice increased TII investment (Burns et al., 2010; Zouari & Rebaï, 2009). Lev and Nissam (2006) provide supportive evidence for why institutional investors encourage earnings management and resulting market volatility and demonstrate they benefit from arbitraging market volatility using financial analysis resources not available to smaller investors. When managers use earnings management to drive up smaller investors buying/selling, institutional investors can detect the moments of arbitrage and benefit from using contrarian selling/buying. One tool of earnings management is VEDs (D'Souza et al., 2010). Financially sophisticated TIIs understand the catering process and the arbitrage periods such catering can create (Hribar et al., 2009).

Hypothesis 2: Higher transient institutional ownership is positively associated with the management issuance of VEDs.

Another incrementally important variable in financial markets is sell-side analysts' recommendations (Howe, Unlu, & Yan, 2009). Analysts' recommendations tend to impact markets most strongly in the weeks just prior to quarterly earnings releases because markets trust analysts to provide higher value information when analyzing data that is not in the regulatory earnings releases (Ivkovic & Jegadeesh, 2004). Several studies document managers using VEDs to manipulate earnings that analysts use for recommendations (Chen et al., 2002; D'Souza et al., 2010). The analysts' effect on stock volatility is equally pronounced whether analysts agree with a VED, ignore a VED or disagree with a VED (Chen et al., 2002; D'Souza et al., 2010). If analysts agree with VEDs, the moderating effect works positively with the managers desired price movements. Analysts ignoring a VED or disagreeing with a VED, creates market confusion between investors tracking VEDs and investors listening to analysts. The conflict between analysts and VEDs is confusing to investors due to the large effect each has on investor market pricing decisions. Whether investors react positively or negatively to the conflicting information between VEDs and analysts' comments, investors create price volatility as they search for equilibrium market prices.

Hypothesis 3: A change in analysts' forecasts during VEDs periods positively moderates the association of the VEDs with stock market volatility.

The stock market price effect of management failing to report voluntary information that concurs with subsequent regulatory reported information is negative (Das et al., 2009), causing less market depth and efficiency and higher volatility. At the same time, as markets move closer to the dates companies release their regulatory reports, investors rely more

heavily on analysts' recommendation (Ivkovic & Jegadeesh, 2004). When companies issue their regulatory reports, stock volatility increases as markets adjust to the equilibrium prices found from the regulatory reports. The adjustment of prices to regulatory reports during VEDs event increases the volatility VEDs create.

Hypothesis 4: Managements release of regulatory reported earnings during VEDs periods positively moderates the association of VEDs with stock market price volatility.

III. Data, Methodology, and Results

III.1 Data

The study uses Standard and Poor's 500 (S&P) companies from 2007 to 2012 to capture post-SOX VED activity. This study uses Mergent Online (MO), Securities and Exchange Commission's Electronic Data Gathering Analysis, Retrieval (SEC EDGAR), ValueLine®, and MorningStar® Investment Research (MIR) databases to collect data. The study only uses firms having 10-Qs and 10-Ks for all four quarters for all six years and listed in the S&P 500 for all seven years.

III.2 Methodology and Analysis

This study uses event study methodology similar to Bushee et al. (2010). Bushee's methodology is particularly suited to this study since this study examines the effect of management-released information on market volatility similar to Bushee's examination of the effect that the presses' release of information has on market volatility. The study uses four-period lag Newey-West regressions to reflect the annual reporting cycle of firms and to overcome potential autocorrelation in the time series data (Ball & Bartov, 1996).

In hypothesis 1, the study uses fixed panel regression analysis, setting company and quarter/year as dummy variables to provide company-specific and across quarters mean quarterly coefficients to determine if the number of VEDs in a quarter is determinate of stock price volatility. To determine the amount of firm-specific volatility during a VED period, the study follows Bushee et al.'s (2010) measurement technique. The study uses two measures of volatility to determine if DMI (short term effect) and ADX (long term effect) increase during the VED event. The volatility measures compare DMI and ADX during the event period with the DMI and ADX for the period prior to the event. The study defines the DMI event period (DEVENT) as day -1 to day +1 around the VED. The ADX event period (AEVENT) begins as day -1 to day +12 around the VED. The prior period (DPRE) for the DMI is the trading days starting two days after the previous VED through two days before the current VED. The prior period (APRE) for the ADX is the trading days starting 12 days after the previous VED through two days before the current VED. The study uses the 62 trading days prior to the VED period as the long pre-event prior period. The study calculates the company's average EVENT period DMI (ECDMI) and ADX (ECADX) minus the EVENT period S&P500 (E500DMI, E500ADX) and company's industry (EIDMI, EIADX) average DMI and ADX. Next, the study computes PRE_EVENT DMI (PCDMI) and ADX (PCADX) as the company's average PRE DMI and ADX minus the PRE S&P500 (P500DMI, P500ADX) and company's industry averages (PIDMI, PIADX). The DMI_Delta and ADX_Delta are the ratio of the EVENT DMI and ADX divided by the PRE DMI and ADX. Then using two fixed panel regressions of the count of the 8-K reports (∑8K) in each fiscal quarter (independent variable) versus the same quarter average DMI_Delta (regression 1a) and quarter average ADX_Delta (regression 1b) (dependent variables), the study assesses the determinant effect of the number of quarterly 8-Ks on the firm-specific and quarter specific volatility during the event periods. Following Bushee et.al. (2010), the fixed dummy variables for the panel

analysis used a company identifier dummy variable (1 to XXX) and a quarter/year dummy variable (1 to 28) for the 8-K reports. Using the two fixed variables allows the intercepts and slopes to vary for each quarter/year and company.

In hypothesis 2, the study uses fixed panel regression analysis to determine if the variance in TII ownership indicates variance in the number of VEDs a company releases. For the independent variable (TIIs), the study tracks the percentage of reported TIIs' ownership in the definitive proxy reports to shareholders (DEF14A) from the SEC EDGAR database. Then the study measures the change in TIIs' percentage ownership between the beginning and ending reporting dates to the change in the number of 8-K filings in the reporting period versus the previous reporting period. Using two measures of TII ownership, the study first regresses (2a) the DEF14A percentage of transient ownership (%TII) against the number of VEDs (∑8K) released between the DEF14A date and the prior DEF14A date. Then the study regresses (2b) the percentage change in transient ownership (ΔTII) against the number of VEDs (∑8K) released in the DEF14A date. Regressions 2a and 2b include the control variables for TII ownership and the firm information environment. A count of the 8-K reports (VEDs) that firms issue between the respective DEF 14A reports serves as the dependent variable for hypothesis 2.

An occurrence of an analysts' forecast change during a VED period represents the moderating variable for hypothesis 3 following Howe et al. (2009). This study uses the Morningstar summary of the dates of analysts' forecast changes for firm-specific forecasts to determine the analysts' changes emanating during a VED. The study compares the average DMI and ADX delta between the event periods and the events' prior periods. Setting the dummy variable to1 if an analysts' forecast changes during the VED period and 0 if it did not, the regression analyses calculates the determinate impact of the analysts' change on the VED volatility.

Measuring the effect of regulatory reports during the VEDs periods in hypothesis 4, the study uses the EDGAR system to identify the dates of 10-Qs and 10-Ks. Then match those dates with the dates occurring during the VED periods. Similar to hypothesis 3, the study computes the average DMI and ADX delta for the events' periods. Setting the dummy variable to 1 if management released a 10-Q or 10-K during the VED period and 0 if they did not, the regression analyses calculates the determinate impact the 10-Qs and 10_Ks have on the VEDs volatility.

Following Burns et al., (2010), the control variables for transient investor ownership include firm size (MV) (defined as log of the market value of equity on the quarter-end date), SIC code (SIC), book-to-market value (BTM) (measured as the book-to-market assets ratio), and firm financial leverage (DTA) (measured as the ratio of short-term and long-term debt to total assets), stock return (RTN) (measured as prior annual stock return nearest the VED date), and sales growth (SG) (measured as the annual revenue growth nearest the VED date). The study controls for a dividend announcement occurring during the event period using a 1 for VED events containing a dividend date and a zero for VED events not containing dividend declaration dates (Mikhail, Walther, & Willis, 2003).

The control variables for a firm's information environment include firm size (LNMV), analyst following (LNANALYST) (measured as the log of one plus the number of analysts), the percentage of institutional ownership (INSTHOLD) (measured at the most recent available date prior to the VED), SIC code (SIC), stock return (RTN), sales growth (SG), and

growth opportunities using the book-to-market assets ratio (BTM).

III.3 Results

Table I contains the descriptive statics for the variables in this study. The data contained 473 firms. The 473 firms represent 13,244 company quarters of data. The companies issued 50,922 VED or a mean of 3.85 VED per company quarter. The mean ΔVolatility 3 day and ΔVolatility 14 day are both positive numbers demonstrating the issue of VEDs creates stock price volatility. The ΔTII mean is positive indicating TII ownership of the S&P 500 increased during the period of this study. To save space, we only show partial results with significance except full results for Table 2.

Hypothesis 1. This study's first hypothesis is that management issuing VEDs is positively associated with stock price volatility. The independent variable is the quarterly count of VEDs. The testing of hypothesis 1 includes two regressions. Regression 1a uses the dependent variable ΔVolatility 3 day (a three-day window around the VED event), and regression 1b uses the dependent variable ΔVolatility 14 day (a fourteen-day window around the VED event). The study uses the two different periods to assess if the VED is associated with a sustained or limited timeframe window for arbitrage. If VEDs are positively associated with both timeframes, the arbitrage window is longer, but if the association changes or weakens from ΔVolatility 3 day to ΔVolatility 14 day then the arbitrage window is shorter or weakens within the 14 days. In Table II, the number of VEDs in a quarter has a positive yet statistically weak association (0.321) with increased stock price volatility using the ΔVolatility 3-day calculation (regression 1a). The positive association indicates the reasoning for hypothesis 1 has validity. Using the ΔVolatility 14 day gets (regression 1b) a negative although again statistically weak coefficient (-0.52). The change from a short-term positive association to a negative long-term association demonstrates the arbitrage window related to a VED is less than fourteen days but does exist for the short-term as markets assimilate the information the VED contains. The results validate the arbitrage opportunities for managers and TIIs during the three-day period surrounding the issuance of a VED.

Hypothesis 2 states that higher TII ownership is positively associated with the management issuance of VEDs. The dependent variable is the quarterly total of VEDs and the study again measures the independent variable in two ways. The first is the average percentage of TII ownership (regression 2a) during the quarter and he second is the percentage of TII ownership change (regression 2b) during the quarter. Instead of the expected positive association between the number of VEDs and the percentage of TII ownership (regression 2a), the results demonstrate a negative association (-5.83) that is statistically significant. In regression 2, the association of VEDs counts to the percentage of change in TII ownership is also statistically significant negative. The results suggest companies issuing greater than average VEDs are not the type of companies the TII desire to own. Results from H2 indicates the TII owners search for companies issuing less VEDs, not more. See the robustness test section below for a discussion and refinement of unexpected negative results for hypothesis 2.

Hypothesis 3 examines if changes in analysts' forecasts during VEDs periods positively moderate the association of the VEDs with stock market volatility. The study captures the number of analysts' changes for the three-day period for DMI and the fourteen-day period for ADX. To test for a positive moderation the study includes the interaction of the count of the VEDs with the count of analysts' changes occurring during the quarterly VED event periods as an independent variable in the regressions for ΔVolatility 3 day (regression 3a) and

ΔVolatility 14 day (regression 3b). We get a statistically weak but positive coefficient of 0.117. The positive coefficient of the interaction between the VEDs count and ΔVolatility 3 day count supports the positive moderation the study expected in hypothesis 3. The regression with ΔVolatility 14 day has a statistically weak, negative coefficient of -0.072. The coefficient being negative demonstrates a negative relationship between analysts' changes and market price volatility for the longer ADX period.

In Hypothesis 4, the study examines if the occurrences of regulatory reports (10Q or 10K) during VED periods positively moderate the association of the VEDs with stock market volatility. To test for a positive moderation the study includes the interaction between the count of the regulatory reports and the count of the VEDs in each quarterly VEDs event period as an independent variable in the regressions for ΔVolatility 3 day (regression 4a) and ΔVolatility 14 day (regression 4b). The negative coefficient (-0.717) of the regulatory moderating variable demonstrates regulatory reports during a DMI event period reduces the VED count predictive association with stock price volatility. The negative moderation effect is opposite the study was expecting in hypothesis 4. The coefficient of the interaction effect for VEDs counts association with ΔVolatility 14 day is -1.112. The negative coefficient demonstrates a negative moderating effect on the relationship between the VEDs count and stock price volatility and it does not support hypothesis 4 that regulatory reporting during a VED event increases the stock price volatility occurring during the event. The lack of statistical significance of regression 4b continues to support the conclusion that the arbitrage period is not present in the 14-day timeframe following the VED.

Robustness Tests. Gompers and Metrick (2001) demonstrate TIIs prefer to invest in large market capital companies. This study examines S&P 500 companies, which are the 500 largest publically traded companies in U.S., so the data has a higher concentration of large companies with TII ownership. Thus, the effect of TIIs on the number of VEDs the companies issue will be less evident than for data sets with higher concentrations of smaller market capitalized companies. In their study, Lev and Nissam (2006) find that smaller firms issue more VEDs to attract TIIs for short moments of arbitrage, but then TIIs divest. Gompers and Metrick's findings of TII preferring large companies as their investment choices further supports the short-term ownership of small market capitalized companies. TIIs use smaller firms for short-term gains, but invest in large firms for longer buy and hold investments. This leads the study to divide the data into large firms and small firms to determine if the small firms predict the positive relationship of hypothesis 2. Due to the size of the S&P 500 companies, the study uses the smallest one third (154 firms) of the companies in the database to test for the positive relationship between the number of VEDs and TII ownership from hypothesis 2.

While in the previous test the coefficient of the TII ownership for all company sizes was -5.831, the coefficient for small firms is 1.827. The regression of the remaining 317 largest firms yields a statistically significant coefficient of -8.332 (Table III). The coefficient of the small firm regression has weak statistical significance, but it is expected given the large market capitalization of even the smallest firms in the S&P 500. The small company regression supports the positive relationship in hypothesis 2, and the results of Lev and Nissam (2006). The negative coefficient for large firm regression supports the findings of Gompers and Metrick (2001) and Ke et al., (2008). The study demonstrates firm size becomes a significant indicator of the predictive power of TII ownership in high VEDs companies.

Tables IV and V show the percentage change in TII ownership negatively relates to the VEDs count no matter the firm size just as Ke et al. (2008) predict. The small firm negative relationship in Table IV (coefficient = -0.008, p<.01) indicates even when small firms attract TII with VEDs, TIIs sell off the small firms after taking advantage of the arbitrage moment and additional VEDs will not attract the TII to return. Table V demonstrates TIIs divest large firms that issue above average VEDs counts even more strongly (coefficient = -.019, p<.01). The weaker negative relationship of TII divesting from small firms in comparison to large firms supports the initial TII attraction to the small firms issuing VEDs (Lev & Nissim, 2006).

Researchers argue that Volatility examines the complete distribution range of the price variances while ΔVolatility averages the distribution range (Clements et al., 2013). Parkinson (1980)defends the Volatility distribution range advantage as a more accurate method of calculating volatility to predict future corrections. Another advantage of Volatility variable is it measures the jumps in volatility due to an event (Eracker, 2004). Garman and Klass (1980) demonstrate the Volatility variable is more efficient than a ΔVolatility variable since it requires less information to gain increased accuracy in predicting corrections. The DMI and ADX variables used in the study are firm-specific averages of the absolute above/below equilibrium price differentials within an event period. Since the DMI and ADX measure daily firm specific variances, use DMI and ADX would suggest firm-specific shocks are more applicable. Therefore, the Volatility variable is more applicable in this study.

The robust study regresses DMI (Volatility 3 Day) and ADX (Volatility 14 Day) as the dependent variables of the VED (independent variable) instead of using ΔVolatility 3 day and ΔVolatility 14 day for H1. The coefficient (.086) of the Volatility 3 Day analysis (Table VI) is statistically significant at the .01 level. The positive relationship of the VED to Volatility 3 Day supports hypothesis 1. The coefficient for the Volatility 14 Day (.122) in is also positive and statistically significant at the .01 level. The larger coefficient for the Volatility 14 Day indicates the volatility from the VED shock lasts longer than the initial three-day VED period.

Adding the moderating variables for analysts' reports and regulatory filings during the VED periods to the Volatility 3 Day and Volatility 14 Day regressions produced three statistically significant findings. In Table VII, analysts' changes during the Volatility 3 Day event have a statistically significant, positive effect on the relationship between VED and the Volatility 3 Day. In Table VIII analysts' changes and regulatory reporting both have statistically significant and positive coefficients in a regression including the two moderating variables and the Volatility 14 Day dependent variable. The results in Tables VII and VIII, support the positive moderation effects the study expected in hypotheses 3 and 4.

IV. Conclusion

This study examines the relationship between institutional ownership, management's release of VEDs, and stock price volatility. Using the ΔVolatility variable, the study does not find statistically significant support for hypothesis 1. In the robustness test, the study uses the Volatility variable and finds statistically significant results that demonstrate VEDs cause stock price volatility in the 3 and 14-day VED event periods in support of hypothesis 1.

The results from the hypothesis 2 regressions are opposite of this study's predictions. Overall TIIs do not prefer companies that issue greater than average numbers of VEDs. However, when we divide our sample into large and small firms, we find that for large firms, TIIs

continuously to avoid companies that issue greater than average numbers of VEDs and will sell off companies that begin issuing above average numbers of VEDs. TII ownership has a positive relationship to the number of VEDs that small firms issue. When small firms continue to issue above average numbers of VEDs, a negative relationship between the changes in TII ownership to the number of VEDs companies issue occurs. TIIs require smaller firms to issue more VEDs before TIIs will invest in them. Above average VEDs from small firms attract the TIIs for short moments of arbitrage followed by divestiture.

Using the ΔVolatility variable, the study does not get statistically significant support for hypothesis 3. In the robustness test, the study uses Volatility variable and find statistically significant results that demonstrate stock analysts' changes do affect investor decisions about stock prices and do create greater price volatility in support of hypothesis 3. The positive moderating effect of analysts' recommendations demonstrates that investors search to understand the VEDs and look to analysts for assistance in formulating how the VEDs effect the stock price. During the period of waiting on analysts' opinions market price volatility occurs. Then as investors gain understanding of the VEDs from the analysts' opinions, even higher market price volatility occurs.

Using the ΔVolatility variable, the study did not calculate statistically significant support for hypothesis 4. In the regressions of the Volatility variable, the relationship was positive but not statistically significant and had smaller t-values except when analysts issued changes concurrent with the regulatory reports. When managers issue regulatory reports in VED periods that also contain analysts' changes, the regulatory reports have a positive moderating effect on the amount of volatility the VED causes. Combining the moderating variables in one regression is the only analysis that supports hypothesis 4.

This study is the first to evidence that regulatory disclosure leads to stock price volatility. The study demonstrates that management providing increased frequency of firm-specific information to the markets does not always lead to lower market price volatility. Greater amounts of information flowing into the markets do not always calm stock price volatility. This study demonstrates that management behavior and investor reactions to management issuing VEDs create moments of stock price volatility. The moments of increased volatility during VED periods supports the price mean reversion theory.

Table I. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
VED	13244	3.845	2.957	0.000	72.000
SIC	13244	10.201	4.918	3.000	23.000
Dividend 3 day	13244	0.273	0.562	0.000	6.000
Dividend 14 day	13244	0.586	0.919	0.000	11.000
Book/Market	13244	0.473	0.424	-3.052	9.425
Regulatory 3 Day	13244	0.322	0.594	0.000	8.000
Regulatory 14 Day	13244	0.831	0.978	0.000	12.000
Firm Size	13244	9.772	1.808	0.000	11.779
Leverage	13244	0.588	0.258	-10.731	3.061
Return	13244	0.992	0.256	0.000	3.859
Revenue Growth	13244	0.088	0.285	-0.899	7.646
TII	13244	0.076	0.021	0.000	0.168

Variable	Obs	Mean	Std. Dev.	Min	Max
ΔTII	13244	0.056	3.555	-0.923	367.737
Analysts 3 Day	13244	0.308	0.689	0.000	11.000
Analysts 14 Day	13244	0.796	1.508	0.000	30.000
ΔVolatility 3 day	13244	10.558	328.606	0.000	26866.900
ΔVolatility 14 day	13244	20.651	1551.809	0.000	178275.500
Regulatory 3 Day x VED	13244	1.568	4.078	0.000	96.000
Regulatory 14 Day x VED	13244	4.073	7.863	0.000	168.000
Analysts 3 day x VED	13244	1.740	9.300	0.000	616.000
Analysts 14 day x VED	13244	4.860	26.202	0.000	1680.000

Table II. Hypothesis 1 Using ΔVolatility 3 day (Regression 1a) (VED independent variable, ΔVolatility 3 day dependent variable)

Variable	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
VED	0.321	0.959	0.330	0.738	-1.559	2.200
Mining	1.071	2.159	0.500	0.620	-3.162	5.303
Utilities	3.633**	1.603	2.270	0.023	0.490	6.776
Construction	3.551	2.386	1.490	0.137	-1.126	8.228
Manufacturing	9.130	6.303	1.450	0.147	-3.224	21.484
Wholesale	1.461	1.483	0.980	0.325	-1.446	4.368
Retail	1.342	1.206	1.110	0.266	-1.022	3.705
Transportation	7.103**	3.532	2.010	0.044	0.180	14.027
Information	6.903*	3.726	1.850	0.064	-0.401	14.207
Financial	4.082***	1.695	2.410	0.016	0.760	7.405
Real Estate	74.748	71.722	1.040	0.297	-65.838	215.334
Professional	1.732	1.751	0.990	0.323	-1.701	5.165
Administrative	7.226	5.451	1.330	0.185	-3.460	17.911
Health Care	0.947	2.613	0.360	0.717	-4.174	6.068
Dividend 3 day	-5.638*	3.080	-1.830	0.067	-11.675	0.400
Book/Market	0.285	2.612	0.110	0.913	-4.835	5.404
Firm Size	-2.792	4.612	-0.610	0.545	-11.832	6.249
Leverage	-7.325	6.740	-1.090	0.277	-20.536	5.887
Return	40.669	44.841	0.910	0.364	-47.226	128.564
Revenue Growth	11.811	14.892	0.790	0.428	-17.380	41.002
Observations	13,048					
R^2	0.21%					

*, **, and *** indicate statistical significance at the .1, .05 and .01 levels, respectively.

Table III. (abbreviated) Hypothesis 2 Using TII Ownership (Regression 2a) for the Largest 317 firms in the S&P 500 (TII independent variable, VED dependent variables)

Variable	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
TII	-8.332***	3.087	-2.700	0.007	-14.384	-2.281
Observations	8,876					
R^2	13.45%					

*, **, and *** indicate statistical significance at the .1, .05 and .01 levels, respectively.

Table IV. (abbreviated) Hypothesis 2 Using TII Ownership Change (Regression 2b) for the Smallest 156 firms (ΔTII independent variable, VED dependent variables)

Variable	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ΔTII	-0.008***	0.001	-8.290	0.000	-0.010	-0.006
Observations	4,368					
R^2	17.62%					

*, **, and *** indicate statistical significance at the .1, .05 and .01 levels, respectively.

Table V. (abbreviated) Hypothesis 2 Using TII Ownership Change (Regression 2b) for the Largest 317 firms (ΔTII independent variable, VED dependent variables)

Variable	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ΔTII	-0.019***	0.002	-8.470	0.000	-0.024	-0.015
Observations	8,876					
R^2	13.32%					

*, **, and *** indicate statistical significance at the .1, .05 and .01 levels, respectively.

Table VI. (abbreviated) Hypothesis 1 Using Volatility 3 Day (Regression 1a) (VED independent variable, Volatility 3 Day dependent variable)

Variable	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
VED	0.086***	0.031	2.720	0.007	0.024	0.147
Observations	13,048					
R^2	20.12%					

*, **, and *** indicate statistical significance at the .1, .05, and .01 levels, respectively

Table VII. (abbreviated) Hypothesis 3 Analyst Changes Moderating Volatility 3 Day (Regression 3a) (VED independent variable, Volatility 3 Day dependent variable, Analysts 3 Day x VED moderating variable)

Variable	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
VED	0.006	0.032	0.200	0.845	-0.057	0.070
Analysts 3 Day x VED	0.047***	0.009	5.470	0.000	0.030	0.064
Observations	13,048					
R^2	20.32%					

*, **, and *** indicate statistical significance at the .1, .05 and .01 levels, respectively.

Table VIII. (abbreviated) Hypothesis 3 Analyst Changes and Hypothesis 4 Regulatory Reports Moderating Volatility 14 Day (Regression 3b) (VED independent variable, Volatility 14 Day dependent variable, Analysts 14 Day x VED and Regulatory 14 Day x VED moderating variables)

Variable	Coef.	StdEr	t	P>t	[95% Conf.	Interval]
VED	-0.011	0.044	-0.260	0.799	-0.096	0.074
Analysts 14 Day x VED	0.021***	0.003	5.940	0.000	0.014	0.027
Regulatory 14 Day x VED	0.021*	0.012	1.700	0.090	-0.003	0.045
Observations	13,048					
R^2	19.48%					

*, **, and *** indicate statistical significance at the .1, .05 and .01 levels, respectively.

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