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The Effect of Earnings Volatility on Stock Price Delay

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Abstract

In this study, I examine the relation between earnings volatility and stock price response delay. I study the effect of the uncertainty of earnings and their components on the stock price response to value-relevant information. For more volatile earnings and earnings components, it is more complex for investors to reliably understand and impound information into stock prices. When earnings and components provide opaque and uncertain information about the future cash flows, I expect that investors are more divergent in their interpretations and delayed in arriving at their future cash flow estimates. To measure firms' response to value-relevant information, I adopt a parsimonious measure of stock price response to information developed by Hou and Moskowitz (2005). I use five-year rolling standard deviations of earnings and components for earnings and components volatility measures. As an additional earnings volatility measure, I adopt the degree to which earnings volatility deviates from cash flow volatility. My study demonstrates that earnings volatility negatively affects stock price response to information. As I hypothesize, the more volatile earnings and components are, the more delayed the market reacts to value-relevant information. Among earnings and their components, the effect of cash flow volatility is the most influential.

Keywords: earnings volatility; capital markets; stock price response delay; U.S.A.

JEL classification: G12; M40.

1. INTRODUCTION

I examine the association between earnings volatility and stock price response delay. I study how earnings and their components volatility affects stock price delay and specifically, examine the effect of the uncertainty of earnings on the stock price response to value-relevant information.

When earnings and components provide less precise information about the future cash flows, I expect that investors are more divergent in digesting it and delayed in arriving at their future cash flow estimates. As current earnings and their components are more volatile, resulting in uncertainty and less persistence, investors encounter difficulty in understanding the underlying implications of earnings information on future cash flows. Because of the effect of volatile earnings' underlying opacity and uncertainty, I posit that the investors' reaction to

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volatile earnings in updating their estimates and arriving at new estimates is delayed. Therefore, I hypothesize that as more volatile earnings and components are, the price formation process takes more time and the reaction is delayed. Since the volatility of cash flows shows the volatility of actual firm performance, I also hypothesize that that cash flow volatility is more influential than earnings and accrual component volatility on stock price delay.

I employ NYSE and NASDAQ listed U.S. firms for the period 2000-2019. Following Hou and Moskowitz (2005), I measure *Delay*, stock price response to value-relevant information. I adopt five-year rolling standard deviations of earnings and their components as my earnings and components volatility measures. Additionally, I add as another volatility measure the extent to which earnings volatility deviates from cash flow volatility. My study shows that as earnings and components are more volatile, the speed that the market interprets and integrates value-relevant information into stock prices is delayed. My study also finds that as earnings components are more divergent, stock price less timely incorporates value-relevant information into it. Combined, my study shows that the volatility of earnings and their components negatively influences stock price response to information.

In Section 2, I review prior research on my research questions. In Section 3, I explain the sample and variables. I present the empirical results in Section 4. Then, I conclude in the final section.

2. PRIOR LITERATURE

Under the efficient securities market theory, the security prices fully and quickly reflect valuation-related information. However, prior research, theoretical and empirical, demonstrates the existence and impact of market frictions affecting the assumption of the efficient securities market theory. Prior studies explore an array of the causes of market frictions such as incomplete and asymmetric information (e.g., Easley, Hvidkjaer, & Ohara, 2002; Hirshleifer, 1988; Merton, 1987), liquidity (e.g., Amihud, 2002; Amihud & Mendelson, 1986; Hou & Moskowitz, 2005), nose trader (e.g., Barberis, Shleifer, & Vishny, 2005; DeLong, Shleifer, Summers, & Waldmann, 1990), and their effect on the efficient market anomaly. Previous studies show that these market frictions influence adversely the speed of information diffusion and the absorption of information into the stock price.

Using his theoretical model, Verrecchia (1980) verifies that the degree of stock price adjustment to newly arriving value-relevant information relies on the quality of that information. Similarly, J. Callen, Govindaraj, and Xu (2000) theoretically show that the stock price adjustment speed and convergence to fundamental value are negatively affected by the noisiness of stock returns. Hou and Moskowitz (2005) develop a parsimonious measure of stock price response to information (*DELAY*) and study the relation between their *DELAY* measure and market frictions. Using *DELAY*, J. L. Callen, Khan, and Lu (2013) show poor accounting quality delays the impounding process of relevant information reflection. Chen, Dong, Li, and Zhang (2018) demonstrate that high audit quality positively facilitates the price formation process and reduces price delay. Gong, Ho, Lo, Karathanasopoulos, and Jiang (2019) identify the negative relation between corporate social responsibility (CSR) performance and stock price delay and suggest CSR as additional information for future stock return forecasts. Xia, Yang, Lin, and Ko (2021) document that American Depositary Receipts (ADRs), which have the largest price delay in response to underlying stocks, require higher returns. Using the Taiwan stock market, Ho, Lee, and Sun (2022) study the relation between disclosure quality and stock price delay. They report that higher disclosure quality decreases the degree of price delay and that as a result, reduces expected stock returns.

Graham, Harvey, and Rajgopal (2005) survey a large sample of CFOs and discover that these executives show a strong preference for less volatile earnings in concern of investors' belief that volatile earnings have less predictability. Much theoretical and empirical research finds that more volatile earnings are less informative (e.g., Arya, Glover, & Sunder, 2003; Demski, 1998). However, others show that income smoothing could distort information contents because opportunistic management could arbitrarily apply accounting rules and choices (e.g., Barth, Landsman, & Lang, 2008; Bhattacharya, Daouk, & Welker, 2003; Leuz, Nanda, & Wysocki, 2003). Tucker and Zarowin (2006) report that smoother earnings impound more future earnings-related information and as a result, less volatile earnings enjoy higher contemporaneous price-earnings relation. Dichev and Tang (2009) find that low volatile earnings are associated with higher earnings persistence and future earnings' predictability.

Earnings are composed of two components, cash flows and accruals. Earnings volatility is affected by individual component's volatility. At the same time, earnings volatility is also affected by the components' covariance. Earnings can be smoothed by accruals as a means of either management's inside information communication to investors or of achieving its specific reporting objective, hiding innate earnings volatility. Rountree, Weston, and Allayannis (2008) investigate whether earnings volatility is associated with firm value and find that earnings volatility and cash flow volatility negatively affect Tobin's q, their firm value measure. Jayaraman (2008) studies the effect of the divergence between earnings volatility and cash flow volatility and documents that when earnings volatility is divergent from that of cash flow, either more or less, they garble information for the market, resulting in higher information asymmetry.

3. SAMPLE AND VARIABLE DEFINITION

3.1 Sample

The initial sample employs NYSE and NASDAQ listed U.S. firms on the COMPUSTAT database. I extract firm-related information from the annual COMPUSTAT database and obtain firms' return and liquidity data from the Center for Research in Security Prices (CRSP) database with share code 10 or 11. In addition, I obtain analyst coverage data from Institutional Brokers Estimate System (I/B/E/S) database.

I require non-missing annual observations for earnings and components data to estimate the earnings volatility measure using rolling 5-year windows. For instance, the 5-year window starts in 2005 and ends in 2009 for the year 2010. I exclude firms in financial and regulated industries and retain all observations with necessary data for control variables. And I remove firms with negative equity value or stock price less than US$1 at the beginning of their fiscal year. To estimate the stock price delay measure, I include only firm-years available in the CRSP with weekly return data.

I winsorize the sample of observations, except stock price delay, at the 1st and 99th percentiles to alleviate the effects of extreme observations. In total, the final sample includes 21,474 firm-years over 2000-2019.

Table no. 1 – Distribution of the sample

Year	# of Firms	Percent
2000	1,057	4.92
2001	1,215	5.66
2002	1,320	6.15
2003	1,294	6.03
2004	1,249	5.82
2005	1,245	5.80
2006	1,166	5.43
2007	1,154	5.37
2008	1,158	5.39
2009	1,120	5.22
2010	1,103	5.14
2011	1,076	5.01
2012	990	4.61
2013	990	4.61
2014	935	4.35
2015	936	4.36
2016	893	4.16
2017	876	4.08
2018	874	4.07
2019	823	3.83
Total	**21,474**	**100**

3.2 Variable measurement

3.2.1 Stock price delay

Following Hou and Moskowitz (2005), I measure *Delay*, stock price response to information. First, I regress each firm stock returns on market returns. The market returns are retained as value-relevant information to which each stock responds.

$$R_{i,t} = \alpha + \beta_1 R_{m,t} + \beta_2 R_{m,t-1} + \beta_3 R_{m,t-2} + \beta_4 R_{m,t-3} + \beta_5 R_{m,t-4} + \epsilon_{i,t} \quad (1)$$

where $R_{i,t}$ is firm *i*'s returns in week *t* and $R_{m,t(t-i)}$ is the CRSP value-weighted market return in week *t(t-i)*. If stock price reacts instantaneously to concurrent market information, which is reflected in contemporaneous market return, β_1 is expected to be significant. If stock price reaction to the market news is delayed, it is anticipated that the lagged market news adds some illustrative power to eq. (1) and some coefficients on lagged market returns (β_2, β_3, β_4, or β_5) are different from zero. Then, I calculate firm-level *DELAY* as follows:

$$DELAY = 1 - (R^2_{restricted}/R^2_{unrestricted}) \quad (2)$$

where $R^2_{unrestricted}$ is the R^2 from eq. (1) and $R^2_{restricted}$ is the R^2 from eq. (1) with the restriction that all delayed market returns' coefficients (β_2, β_3, β_4, and β_5) are zero. *DELAY* increases as lagged market returns explain more firm *i*'s returns in week *t*, so a higher value of *DELAY* indicates more delayed firm *i*'s response to the market news.

Following Hou and Moskowitz (2005)'s methodology, first, I implement eq. (1) using weekly return data from July_{t-1} to June_t at the firm level. Then, to lessen the firm-level estimation error problems, I calculate the portfolio-level measure based on the size (market capitalization) deciles at June_t. To do this, I sort firms into the size decile, then within each size decile, I sort firms into deciles based on the firm-level *DELAY* from eq. (1). For each 100 size-delay portfolio, I recalculate the portfolio-level *DELAY* values and designate them to all firms in each portfolio. If I use individual firm-level *DELAY*, the test results are almost identical.

3.2.2 Earnings volatility

Following previous literature, I adopt earnings before extraordinary items as earnings measure. I use cash flows from operation as cash flow measure and the difference between earnings and cash flows as accrual measure. All earnings measures are scaled by average total assets. I define five-year rolling standard deviations of earnings and components as earnings and components volatility measures.

Jayaraman (2008) reports that earnings that are either smoother or more volatile than cash flows could distort information for the market. He brands the difference between volatility of earnings and volatility of cash flows as the accrual component of earnings volatility (*ACEV*), the extent to which earnings volatility diverges from cash flow volatility. In his study, he finds a u-shaped relation between *ACEV* and information asymmetry so I adopt the absolute value of the accrual component of earnings volatility (*AACEV*) as another earnings volatility measure. The higher *AACEV* is the greater divergence between earnings volatility and cash flow volatility.

For more volatile earnings and components, it is more complex for investors to reliably understand and incorporate information into stock prices. When earnings and components provide opaque and uncertain information about the future cash flows, I expect that investors are more divergent in their interpretations and delayed in arriving at their future cash flow estimates. I adopt one-year-lagged earnings volatility measure to reflect earnings volatility information.

3.2.3 Control variables

Following prior research, I control for loss, liquidity, market-to-book, stock exchange, and analysts. *LOSSR* is the three-year period relative annual loss frequency to control for corporate performance. To control for stock liquidity, I add *LIQUIDITY*. *LIQUIDITY* is the natural logarithm value of the average monthly turnover ratio, which is the monthly number of shares traded divided by the number of shares outstanding. To control for value/growth, I use *MB*, which is the ratio of the market value of equity to the book value of equity. *NASDAQ* is an indicator variable, which is 1 if firms are listed on NASDAQ and 0 otherwise. Following J. L. Callen et al. (2013), I include *ANALYST*, which is the natural logarithm value of (1 + the number of analysts following) to control for investor attention and size. To control for industry members, I add *INDUSTRY* using 12 Fama-French industries.

I expect that *LOSSR* and *NASDAQ* delay stock price response to information and *LIQUIDITY*, *MB*, and *ANALYST* hasten it.

4. EMPIRICAL RESULTS

4.1 Univariate analysis

Table no. 2 and Table no. 3 show univariate analyses. Table no. 2, Panel A presents the descriptive statistics of firm characteristic variables. The mean and the median values of the firm price delay measure (*DELAY*) are 0.0952 and 0.0280, respectively. While the bottom quartile *DELAY* is 0.0088, the top quartile is 0.1016. *DELAY* measure reveals sizable variation. Earnings and components volatility measures also show considerable variation. The mean (median) of earnings volatility (*EV)* is 0.0641 (0.0364). The mean value of cash flow volatility (*CFV*) is 0.0578, while the median value is 0.0425. The mean (median) of accrual volatility (*ACCV)*, the other earnings component, is 0.0648 (0.0457). The comprehensive measure of earnings volatility, the absolute value of the difference between volatility of earnings and volatility of cash (*AACEV*), also shows sizable variation, with the bottom quartile being 0.0004, the top quartile being 0.0054. The three-year period relative annual loss frequency (*LOSSR*) is 0.2235 (mean), the natural logarithm value of average monthly share turnover (*LIQUIDITY*), liquidity measure -2.0502 (mean), and around half of the sample firms are listed on NASDAQ.

Table no. 2, Panel B shows the Spearman rank correlation structure. Consistent with my expectation, all four earnings volatility measures are positively correlated with the price delay measure (all, p-value<0.0001). Among these variables, *CFV*'s correlation is the highest (0.2251). These preliminary results report that earnings volatility is negatively related to the stock price formation process responding to the market news. As firms report more losses in the past, their stock price response to information is delayed (0.1873, p-value<0.0001). NASDAQ-listed firms are more correlated with delayed stock price response (0.2059, p-value<0.0001). *LIQUIDITY* is negatively correlated with *DELAY*, showing that market friction (illiquidity) is associated with stock price delay. *Analysts*, a proxy for investor attention, is negatively correlated (-0.3750, p-value<0.0001). This indicates that as more analysts follow the firms, their stock price formation processes are facilitated. *MB* is also negatively correlate with *DELAY* (-0.1740, p-value<0.0001). All variables are in the predicted directions.

Table no. 2 – Descriptive statistics and correlation

Panel A: Descriptive statistics of firm characteristics (n=21,474)

Variables	Mean	Std. dev	Q1	Median	Q3
DELAY	0.0952	0.1577	0.0088	0.0280	0.1016
EV	0.0641	0.0733	0.0186	0.0364	0.07958
CFV	0.0578	0.0515	0.0251	0.0425	0.0722
ACCV	0.0648	0.0601	0.0260	0.0457	0.0810
AACEV	0.0073	0.0184	0.0004	0.0015	0.0054
LOSSR	0.2235	0.3168	0.0000	0.0000	0.4000
LIQUIDITY	-2.0502	0.8836	-2.5701	-1.9648	-1.4412
MB	3.0425	3.1074	1.3374	2.1599	3.5573
NASDAQ	0.5401	0.4983	0.0000	1.0000	1.0000
ANALYST	1.7718	1.0583	1.0986	1.9459	2.5649

Panel B: Spearman correlation of firm characteristics (n=21,474)

	EV	*CFV*	*ACCV*	*AACEV*	*LOSSR*	*LIQUIDITY*	*MB*	*NASDAQ*	*ANALYST*
DELAY	0.1620	0.2251	0.2121	0.2068	0.1873	-0.2763	-0.1740	0.2059	-0.3750
EV		0.5856	0.6810	0.6665	0.6762	0.1543	-.0088	0.3064	-0.1662
CFV			0.6762	0.6999	0.3922	0.0658	-0.0121	0.3090	-0.2422
ACCV				0.8331	0.4997	0.0339	-0.1048	0.2661	-0.2716
AACEV					0.3435	0.0261	-0.0752	0.1856	-0.1934
LOSSR						0.0460	-0.1301	0.2590	-0.2264
LIQUIDITY							0.2257	-0.0022	0.5141
MB								0.0067	0.3640
NASDAQ									-0.2030

Note: All variables are statistically significant at the 1% level.

Variable definitions:

DELAY: 1- $\left(\frac{R^2_{restricted}}{R^2_{unrestricted}}\right)$ from $R_{i,t} = \alpha + \beta_1 * R_{m,t} + \beta_2 * R_{m,t-1} + \beta_3 * R_{m,t-2} + \beta_4 * R_{m,t-3} + \beta_5 * R_{m,t-4} + \epsilon_{i,t}$, (1)

where $R_{i,t}$ is firm *i*'s return in week *t* and $R_{M,t(t-1)}$ is the CRSP value-weighted market return in week *t (t-1)*, $R^2_{unrestricted}$ is the R^2 from eq. (1) and $R^2_{restricted}$ is the R^2 from eq. (1) with the restriction that all delayed market returns' coefficients (β_2, β_3, β_4, and β_5) are zero.

I implement the above equation using weekly return data from $\text{July}_{t-1}$to June_t at the firm level. Then, to lessen the firm-level estimation error problems, I calculate the portfolio-level measure based on the size (market capitalization) deciles at June_t. To do this, I sort firms into the size decile, then within each size decile, I sort firms into deciles based on the firm-level *DELAY* from the equation. For each 100 size-delay portfolio, I recalculate the portfolio-level *DELAY* values and designate them to all firms in each portfolio.

EV: five-year rolling standard deviations of cash flows (earnings before extraordinary items) scaled by average total assets; *CFV*: five-year rolling standard deviations of earnings (cash flows from the operation) scaled by average total assets; *ACCV*: five-year rolling standard deviations of accruals (the difference between earnings and cash flows) scaled by average total assets; *AACEV*: the difference between volatility of earnings and volatility of cash flows as the accrual component of earnings volatility; *LOSSR*: three-year period relative annual loss frequency; *LIQUIDITY*: natural logarithm value of the average monthly turnover ratio, which is the monthly number of shares traded divided by the number of shares outstanding; *MB*: market value of equity divided by the book value of equity; *NASDAQ*: an indicator variable, which is 1 if firms are listed on *NASDAQ* and 0 otherwise; *ANALYST*: natural logarithm value of (1 + the number of analysts following).

In Table no. 3, I further analyze the effect of earnings volatility on price delay. First, I sort firms into quintiles based on earnings and components volatility values and report the mean value of and their t-test results. As earnings and component volatility values increase, *DELAY* increases monotonically. It also shows that *DELAY* fluctuates more across the cash flow quintile than other volatility quintiles (difference value=0.0715). When I test median values, their Wilcoxon rank-sum test results are identical.

Table no. 3 – Level of *DELAY* for each volatility quintile level (n=21,474)

DELAY	*EV* quintile		*CFV* quintile		*ACCV* quintile		*AACEV* quintile	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Low	0.0730	0.0207	0.0589	0.0177	0.0606	0.0178	0.0612	0.0181
2	0.0821	0.0221	0.0804	0.0222	0.0774	0.0211	0.0794	0.0217
3	0.0910	0.0259	0.0925	0.0270	0.0926	0.0271	0.0951	0.0270
4	0.1057	0.0318	0.1136	0.0346	0.1138	0.0369	0.1134	0.0369
High	0.1241	0.0500	0.1304	0.0526	0.1313	0.0523	0.1267	0.0508
Difference (Low-High)	0.0511	0.0293	0.0715	0.0349	0.0707	0.0345	0.0655	0.0327
p-value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

Note: All variables are defined in Table no. 2.

4.2 Multivariate regression test

To investigate how the volatility of earnings and components affects stock price delay, I run the following regressions with control variables.

$$\begin{aligned} DELAY_{i,t} = \alpha + \beta_1 VOLATILITY_{i,t-1} + \beta_2 LOSSR_{i,t-1} + \beta_3 LIQUIDITY_{i,t-1} \\ + \beta_4 MB_{i,t-1} + \beta_5 NASDAQ_{i,t-1} + \beta_6 ANALYST_{i,t-1} \\ + \sum INDUSTRY\ FIXED\ EFFECT + \varsigma_{i,t} \end{aligned} \quad (3)$$

The measure of stock price response to information, *DELAY*, is the dependent variable in the regression analyses. *DELAY* captures how timely stock price incorporates value-relevant information into it. A higher value of *DELAY* indicates a more delayed stock price response to information. The main independent variable, *VOLATILITY,* is volatility measures of earnings and components. I use log-scale-transformed volatility measures (*Ln(EV), Ln(CFV), Ln(ACCV),* and *Ln(AACEV)*) for the regressions. As current earnings and components are more volatile, resulting in uncertainty and less persistence, investors encounter difficulty in understanding the underlying implications of earnings and components on future cash flows. Because of the effect of volatile earnings' underlying opacity and uncertainty, I posit that the investors' reaction to update their estimates and to arrive at new estimates is delayed.

In Table no. 4, Panel A, I report a series of regression results, which is based on two-way cluster-robust standard errors. Following Gow, Ormazabal, and Taylor (2010), I adopt robust standard errors clustered by both firm and year to control for heteroscedasticity and correlation.

Table no. 4, Panel A, column 1 reports the effect of earnings volatility on the stock price delay. As I posit, I find a positive and highly statistically significant relation between earning volatility and stock price delay (0.0131, at the 1 percent level). In Table no. 4, Panel A, columns 2 and 3, I decompose earnings into cash flows and accruals and run regressions separately. Both coefficients are positive and highly statistically significant (0.0225 and 0.0165, both at the 1 percent level). These results show that the volatility of earnings and components negatively affects the speed that the market interprets and integrates relevant information into stock prices. The more volatile earnings and components are, the more delayed the market reacts to information. In column 4 of Table no. 4, Panel A, I separate earnings into two components and include both earnings components in the regression. The results report that the coefficients of both components are positive (0.0189 and 0.0062, both significant at the 1 percent level) and as the results of Model 2 and 3, the coefficient of cash flows is larger than the coefficient of accruals. Compared to the separated regression results, the coefficient on accruals decreases more than that of cash flows. Because these two components are highly negatively correlated, I add the correlation measure along with these two separate components in column 5 of Table no. 4, Panel A. Regardless of whether I include the correlation measure or not, my results show that the coefficient on cash flows is larger than that of accruals. The effect of cash flow volatility is the most influential. As an additional test, I include *AACEV* as earnings volatility measure in the regression in column 6 of Table no. 4, Panel A. *AACEV* represents the divergence between earnings and operating cash flows. The results indicate that as the divergence increases, *DELAY* increases (0.0074 at the 1 percent level). This demonstrates that the divergence between earnings and operating cash flows influences the degree of stock price adjustment to newly arriving value-relevant information. This corroborates that as earnings components are more divergent, stock price less timely incorporates value-relevant information into it. The results for the control variables are matched to my expectations and are comparable to those of previous research.

In Table no. 4, Panel B, as robust tests, I estimate pooled simple OLS regressions, adding year variable to control for time effect, without any standard error corrections. Then, I run the autocorrelation-adjusted Fama and MacBeth regressions. Lastly, I provide the results based on the Exponential GARCH (1,1) model. To save space, I report only coefficients on earnings and component volatility measures and the results are identical to those in Table no. 4, Panel A. These results corroborate my findings based on the two-way cluster-robust standard errors in Table no. 4, Panel A.

Table no. 4 – Multivariate regression analysis (n=21,474)

Panel A: Two-way clustered regression results (Dependent Variable = DELAY)

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
INTERCEPT	0.0532***	0.0791***	0.0548***	0.0857***	0.0871***	0.0566***
Ln(EV)	0.0131***					
Ln(CFV)		0.0225***		0.0189***	0.0191***	
Ln(ACCV)			0.0165***	0.0062***	0.0061***	
CORR.					0.0016	
Ln(AACEV)						0.0074***
LOSSR	0.0195***	0.0260***	0.0260***	0.0226***	0.0216***	0.02256***
LIQUIDITY	-0.0484***	-0.0488***	-0.0477***	-0.0491***	-0.0492***	-0.0479***
MB	-0.0024***	-0.0027***	-0.0022***	-0.0026***	-0.0026***	-0.0024***
NASDAQ	0.0299***	0.0273***	0.0302***	0.0271***	0.0269***	0.0300***
ANALYST	-0.0231***	-0.0206***	-0.0217***	-0.0202***	-0.0202***	-0.0221***
INDUSTRY	Included	Included	Included	Included	Included	Included
Adj.R^2	0.1863	0.1918	0.1877	0.1926	0.1923	0.1882

Note: *, **, and *** indicate statistical significance at the 10, 5, and 1% levels, respectively. All variables are defined in Table no. 2.

Panel B: Model variation (Dependent Variable = DELAY)

Variation Type	OLS			Fama and MacBeth			EGARCH(1,1)		
	Model 1, 2, & 6	Model 3	Model 4	Model 1, 2, & 6	Model 3	Model 4	Model 1, 2, & 6	Model 3	Model 4
Coefficient on *Ln(EV)*	0.0118***			0.0122***			0.0111***		
Coefficient on *Ln(CFV)*	0.0208***	0.0176***	0.0178***	0.0197***	0.0158***	0.0161***	0.0193***	0.0164***	0.0173***
Coefficient on *Ln(ACCV)*	0.0149***	0.0056**	0.0055***	0.0153***	0.0067***	0.0066***	0.0126***	0.0040***	0.0042***
Coefficient on *CORR*			0.0013			0.0019			0.0021
Coefficient on *Ln(AACEV)*	0.0067***			0.0069***			0.0062***		

Note: *, **, and *** indicate statistical significance at the 10, 5, and 1% levels, respectively. All variables are defined in Table no. 2.

Overall, my results show that the volatility of earnings and components negatively affects the speed that the market interprets and integrates value-relevant information into stock prices. Specifically, the more volatile earnings and components are, the more delayed the market reacts to information. Among earnings and components, the effect of cash flow volatility is the most influential. In addition, the divergence between earnings volatility and cash flow volatility delays stock price's timely incorporation of value-relevant information. Unlike the cash flow component, the accrual component reflects the managerial estimates, which may result in exposure to measurement errors and potential manipulation. Earnings, which include the accrual component, have the potential to be exposed to the same risk. The information in cash flows reflects realized firm performance results and provides information about the firm's expected future cash flows. Since the volatility of cash flows shows the volatility of actual work performance, it seems to have the greatest impact on stock price delay. Using *AACEV*, which measures the divergence between earnings volatility and cash flow volatility, my results show that the more a company's earnings deviate from its cash flows, or realized company performance, the greater the delay in the market's incorporation of value-related information into the stock price. Combined, this study demonstrates that earnings volatility negatively affects stock price response to information.

5. CONCLUSIONS

I study the relation between earnings volatility and stock price delay. Using a sample of NYSE and NASDAQ listed U.S. firms for the period 2000-2019, I explore how earnings and their components volatility affects stock price delay and examine how the uncertainty of earnings impacts the stock price response to valuation relevant information.

I adopt *DELAY* developed by Hou and Moskowitz (2005) as a measure of stock price response to information. *DELAY* assesses the impounding process of relevant information reflection into the stock price. For volatility measures, I use five-year rolling standard deviations of earnings and components as earnings and components volatility measures. In addition, I adopt *AACEV*, which represents the divergence between earnings volatility and cash flow volatility. I expect that investors are more divergent in their interpretations and delayed in arriving at their future cash flow estimates.

As I posit, I find that the volatility of earnings and components negatively affects the speed that the market interprets and integrates value-relevant information into stock prices. The more volatile earnings and components are, the more delayed the market reacts to information. Among earnings and components, the effect of cash flow volatility is the most influential. In addition, the divergence between earnings volatility and cash flow volatility also negatively influences stock price response to information. This verifies that as earnings components are divergent, stock price less timely incorporates value-relevant information into it.

My study provides the empirical results connecting that volatile earnings and components, which contain more opaque and uncertain information about the future cash flows, and delayed investors' response to understand and impound value-relevant information into stock prices. My study empirical shows earnings and component volatility affects investors' decision-making process. However, to have a more accurate and clear understanding of investors' overall decision-making process, it is required to develop measures that can directly appraise the investors' decision-making procedures and to further investigate the underlying processes. Despite these limitations, this study contributes to a more in-depth and diverse study of the investment decision-making process and factors that influence it.

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