

## Differential Investors' Response to Restatement Announcements: An Empirical Investigation

Sebahattin Demirkan<sup>1</sup> and Harlan Platt<sup>2</sup>

### ***Abstract:***

*When firms announce a restatement of their financial reports, they inform investors that their prior announcements were faulty. Not only do companies lose credibility at times such as this but also their securities are revalued as investors respond to the substance of the announcement. We investigate investor size to understand how large and small investors differ in their responses to restatement announcements. Our results indicate that large investors seemingly anticipate the announcement; their holdings decrease before restatement announcements; consequently large investors trading after announcements is less pronounced than for smaller investors. The response of small investors depends on who has prompted the restatement: the company itself, FASB or the SEC and not on the reason for the restatement such as problems with revenue recognition, restructuring or cost/expense. Large investor trading volume is affected by both the source of the restatement and the reason for it. Large investors seem to anticipate potential problems, and sell securities before restatement announcements*

***Keywords:*** Restatement; Investor Size; Information; Trading Response; Prompters of restatement; Reasons of Restatements

### **Introduction**

---

<sup>1</sup> Bentley University, sdemirkan@bentley.edu

<sup>2</sup> Northeastern University, h.platt@neu.edu

Few researchers have questioned how different types of investors react to the announcement of accounting restatements. This study seeks answers to several related questions about the reaction of different investors to restatements. Specifically, we consider whether the response of large and small investors is different either before and/or after the announcement of a restatement and whether their responses are affected by the reason for the restatement or who has prompted the restatements.

Despite the heavy reliance investors place on accounting financial statements they are not flawless<sup>3</sup>. When errors are discovered, restatements are issued that reveal the consequences of the mistakes with the updated accurate information. However, accounting restatements signal that prior statements are not credible. Accounting restatements are increasingly more common in financial reporting as a result investors respond negatively to restatement news Anderson and Yohn (2002). Palmrose et al. (2004) (PRS) document a mean (median) negative market reaction of -9.2 % (-4.6%) over a two-day event window to a restatement announcement using market adjusted abnormal returns. PRS also found negative equity returns to be larger when restatements a) involve fraud, b) financial accounts, c) affect reported income and d) are attributed to auditors and management.

Ohlson (1975) and Wilson (1975) theoretical works showed that wealthier investors get more benefit from information emanated from firms. Moreover, wealthier and more informed investors are likely to make larger trades at the time of the earnings announcements (Cready, 1988; Lee (1988); Lee and Radhakrishna (2000)). Prior research also showed that transaction size increases with informedness of investors (Easley and O'Hara (1987); Hasbrouck (1998)). Following above arguments, large traders may have the capability and discipline to investigate the detail structure of a restatement announcement and formulate a reasoned trading strategy. Small traders are unlikely to have the ability or resources to interpret restatements to the same depth as large traders; therefore, small traders are likely to respond differently to restatements than large traders. Alternatively, large investors are more likely to trade speculatively and adjust their holdings on the day of the earnings or restatement announcements Demski and Feltham (1994).

---

<sup>3</sup> Investors use a firm's financial information to estimate value (see, Ball and Brown (1968) and Beaver (1968)). Financial information also reduces information asymmetry between executives and stock holders (see, Lee et al. (1993)). Valuations are only as good as the information presented in financial statements. This statement has led to various research threads including Lang and Lundholm (1993) who studied analyst perception of disclosure quality, Defond and Park (2001) who examined earnings persistence, and Jones (1991) who looked at the quality of accounting information.

As we stated above accounting restatements signal that prior statements are flawed. That discovery decreases investors' confidence in restating firms and their managements, and may lead investors to change their future investment plans. General Accounting Office (2002) observes accounting restatements decreasing investor wealth because of falling equity values. Dhaliwal et al. (2010) note that institutional investors may shift portfolios away from businesses that restate. Hribar et al. (2005) (HJW) studied the relationship between investor type (i.e., transient, dedicated, and quasi-indexing institutions) and restatements. They found higher portfolio turnover among transient institutional investors, i.e., those with shorter investment horizons, prior to a quarterly restatement. Neither dedicated nor quasi-indexing institutions made similar pre-restatement portfolio changes. HJW utilized the 13f filing database<sup>4</sup>. That database does not detail portfolio changes by both small and large investors. Nor did HJW investigate the effect on trading behavior of a) who prompted the restatement or b) the restatements' reasons what we are investigating.

Our paper contributes to the literature by classifying investors as small and large traders according to their daily trade size around accounting restatement announcement date to determine their trading behavior and what specific information they trade on. Specifically, we examine small and large trader's ex-ante and ex-post trading behavior and how this behavior is affected by who prompted the restatement and the reason for the restatement<sup>5</sup>. We use event study methodology to reduce the impact of other events occurring around the restatement announcement date which differentiate our study from HJW study. Like PRS (2004) we find that financial reporting restatements influence stock prices. We also find that type of restatement, who is the prompter and the reason for the restatement, differentially affect share price as does investor size.

We conjecture that these differential trading behaviors of small and large investors result from the way that they interpret public announcements differently in a fashion similar to Kim and Verrecchia (1991) framework where investors' information set and sophistication play significant role on their usage. We find that the trading pattern of large investors seems to anticipate restatements; they sell before the announcement and then repurchase the stock at a discount after the restatement. Small investors exhibit less pre-restatement foresight than large investors. We also observe a relationship between the structure of restatement announcements (initiator and reasons) and the degree of traders' responses as measured by abnormal trading volume.

---

<sup>4</sup> Firms are required to detail quarterly the ownership positions of major shareholders in the form of 13f filings to the SEC.

<sup>5</sup> Restatements of financials have different characteristics related to who prompted the restatement and the reasons for the restatement.

The remainder of the paper is organized as follows: Section 2 describes the research design then presents research issues, Section 3 defines sample selection and variable measurement, Section 4 identifies empirical methods, Section 5 reports empirical findings and Section 6 presents concluding remarks.

### Research Issues

Accounting restatements reveal to investors required corrections to previously reported financial statements. We studied ex-ante and ex-post trading response of large and small investors to accounting restatement using an event study approach. We also investigated the ability of small and large investors to use information on the characteristics of restatements.

El-Gazzar (1998) showed that large investors rely on more pre-disclosure information in developing earnings expectations. This finding may extend to the ability of investors to anticipate accounting restatement. HJW (2005) found that transient institutional investors sell shares of restated companies at least a quarter before the announcement and thereby avoid potential losses; in contrast, other types of institutional investors and individuals fail to anticipate the restatement and trade on days around the restatement. That is, trading by transient institutional investors is relatively lower in volume than other types of investors.

We believe that the lower trading volume of large investors around the restatement announcement window occurs because they have already traded out of the stock HJW (2005)<sup>6</sup>. Small investors lacking sophisticated information sources and knowledge possessed by large investors are not prepared to trade before restatement announcements that supports HJW's findings about institutional investors.

There are 11 categories of reasons for accounting restatements. These are (1) cost or expense due to miscalculations; (2) in process research and development expenses; (3) loan-loss related; (4) other (not any of the classification); (5) reclassification; (6) related party transactions; (7) restructuring, asset or inventory based; (8) improper revenue recognition; (9) securities related; (10) tax related; and (11) unspecified.

Desai et al. (2006), who did not bifurcate investors by size, report that restatements resulting from improper revenue recognition (item #8) are most common (37%) and generate the largest negative equity price reaction (-14.89%). Restatements for improper cost

---

<sup>6</sup> Our study is different from HJW's because we show exactly how different small and large traders behave around the restatement announcement window. We also show that different types of investors would use information within restatement announcements. By using the TAQ database, we are able to determine whether the initiator of trades for a stock are either small or large investors enabling us to refine the HJW findings.

recognition (item #1) cause the next largest equity price response (-10.51%). Restatements from all other reasons generate abnormal returns of (-7.98%). They find that company-prompted restatements result in a mean equity price change of (-11.33%) while those derived from auditor-prompted restatements lead to mean equity price changes of (-15.21%). The abnormal return associated with all other prompters, including those that were not identified, is (-9.34%). We are interested in understanding the trading behavior of large and small investors around the restatement announcement. Their differential understanding of restatements i.e. who prompts the restatement and the structure or reasons for restatements may cause important signaling information differences between classes of.

### **Sample Selection and Variable Measurement**

Sample Selection: Accounting restatement data are collected from the General Accounting Office's (GAO) restatement database. The GAO compiled a sample of 919 restatements due to the accounting irregularities occurring between January 1, 1997, and June 30, 2002 in US capital markets. The database includes for restating firms their name, ticker symbol, listing market, the restatement announcement date, the number of shares outstanding, the initiator or prompter of the restatement, and the reason(s) for the restatement. Restatements arising from mergers and acquisitions are excluded from our sample since those have unique characteristics. In addition, Easley et al. (2001) found that stock splits affect trading volume and since we intend to use trading volume as a metric for evaluating investor behavior, firms that split their stock or paid out stock dividends are excluded from the sample. Following Asthana et al. (2004), opening trade price and volume data are deleted from our sample since they may be noisy. Table 1 contains information about the characteristics of the restatement sample. The most frequent reason is revenue recognition with 46.91% weight. The next largest subgroup is restatements the GAO reports "unknown" as the reason for the announcement with 40.73% weight. Large traders may better understand the causes of the unknown category of restatements because of their richer information sources.

Financial statement and equity returns data for the 919 companies are taken from CRSP/COMPUSTAT Merged-Combined Industrial Annual database for NYSE, AMEX and NASDAQ firms. Trades and Quotations (TAQ) database provides information about individual equity trade on a second-by-second time interval basis. This database reports every round-lot trade and every quote from 1993 onwards on the NYSE, AMEX, and NASDAQ exchange markets. Trades (transactions) are classified as buyer or seller initiated and then aggregated on a daily basis for each stock. Analysts' reviews and forecasts are obtained from the IBES database. The final sample contains 275 firms after intersecting these databases to get necessary variables to test for our arguments.

**Table 1**

Distribution of Reasons and Prompters in Restatement Sample\*

**Panel A:** Distribution of Restatements by year

Year	1997	1998	1999	2000	2001	2002
N	17	14	48	51	102	43

**Panel B:** Prompters (Initiators) of Restatements

Prompter	Freq	Percent	Cumulative Percent
Pdum1- Auditor	14	5.09	5.09
Pdum2- Company	104	37.82	42.91
Pdum3- Company/FASB	2	0.73	43.64
Pdum4- Company/SEC	2	0.73	44.36
Pdum5- External	1	0.36	44.73
Pdum6- FASB	1	0.36	45.09
Pdum7- NASDAQ	1	0.36	45.45
Pdum8- SEC	38	13.82	59.27
Pdum9- Unknown	112	40.73	100.00
<b>Total</b>	275	100.00	

**Panel C:** Reasons of Restatements

Reason	Freq	Percent	Cumulative Percent
Rdum1-Cost/Expense	32	11.64	11.64
Rdum2-IPR&D	19	6.91	18.55
Rdum3-Loan-Loss	1	0.36	18.91
Rdum4-Other	17	6.18	25.09
Rdum5-Reclassification	9	3.27	28.36
Rdum6-Related Party. Trans	8	2.91	31.27
Rdum7-Restructuring	38	13.82	45.09
Rdum8-Revenue Recog.	129	46.91	92.00
Rdum9-Securities Related	11	4.00	96.00
Rdum10-Tax Related	3	1.09	97.09
Rdum11-Unspecified	8	2.91	100.00
<b>Total</b>	275	100.00	

\*Restatement sample spans from 1997 to 2002 that is extracted from GAO (2002) Restatement report.

Variable Measurement: There are two standard approaches for distinguishing between large and small traders. Cready (1988) bifurcates traders based on the number of shares traded. Lee (1992) instead relies on the dollar value of a transaction. Lee and Radhakrishnan (2000) document that dollar value based proxies of trader size are generally less noisy than other trade size proxies. Consequently, the dollar value based proxy of trader size is employed in this study along lines suggested by Asthana et al (2004). That is, we bifurcate small and large traders following Bhattacharya (2001). He assumed a trade less than or equal to \$5,000 is made by a small investor and a trade greater than or equal to \$50,000 is initiated by a large investor. Asthana et al. (2004) modified Bhattacharya (2001) for small investors if stocks are priced greater than \$50 especially when investors only trade in the round of 100 shares or more. We may not be able to get any small traders classification if we just focus on dollar value approach. As in Asthana et al. (2004) we modify Bhattacharya (2001) for firms with a share price greater than \$50 per share, we define small trades as those less than or equal to 100 times the share price.

Abnormal volume (AVOL) measures unusual trading behavior. This study uses Asthana and Balsam's (2001) measure of AVOL described in equation (1) for a single company.

$$AVOL = \left( \frac{VOL - \mu(VOL)}{\sigma(VOL)} \right) \quad (1)$$

where VOL is the daily trading volume measured in shares, and  $\mu$  and  $\sigma$  are the corresponding mean and standard deviations calculated over 55 days beginning 60 days before and ending five days before the announcement of an accounting restatement i.e. between announcement day  $t-60$  and  $t-5$ <sup>7</sup>.

Utilizing the method described above to bifurcate traders into large and small categories, AVOL is calculated for both types of traders separately as seen in equation (1A) and (1B) following Asthana et al (2004) to determine how the abnormal volume of small and large investors for a single stock.

<sup>7</sup> This is a longer estimation period for VOL than in Asthana et al. (2004) in order to move to a quarter-of-a-year timeframe (approximately 60 days measurement period).

$$AVOL(LARGE) = \left( \frac{VOL_{large} - \mu(VOL_{large})}{\sigma(VOL_{large})} \right) \quad (1a)$$

$$AVOL(SMALL) = \left( \frac{VOL_{small} - \mu(VOL_{small})}{\sigma(VOL_{small})} \right) \quad (1b)$$

Asthana et al (2004)'s results are insensitive to the length of the estimation window. To measure AVOL they use a 5 day event window from t-1 to t+3 days of a restatement announcement where t stands for announcement day. In our event study, a 25 day period is used as a test period beginning 4 days before and ending 20 days after the announcement of an accounting restatement. AVOL (SML) and AVOL (LRG) are calculated over this 25 day time period to observe ex-post trading behavior of large and small investors.

Trading balance is also calculated to investigate whether trades are buys or sells. Then trading reaction is measured using variables based on net directional trading (i.e., net order flow). NETBUY and ANETBUY are calculated with the modified Lee and Ready (1991) algorithm based on execution price without the zero-tick test, to determine which side (buy or sell) initiated a given trade<sup>8</sup>. NETBUY is defined as in equation (2).

$$NETBUY = \frac{(Total\ Buy\ Trading\ Size) - (Total\ Sell\ Trading\ Size)}{Average(Total\ Buy + Total\ Sell)} \quad (2)$$

NETBUY values are calculated for small and large traders separately similar to the procedure above for AVOL for each firm. The estimation period for NETBUY is from 60 day prior to 5 day before the restatement announcement day (t-60 to t-5) to find historical values for NETBUY. Then during the test period distribution of buyers and sellers is calculated between 4 days prior to the announcement and ending 20 days after the restatement. Daily mean and median tests are applied to compare the trading behaviors of each investor group in the 25 days test period.

<sup>8</sup> The algorithm involves matching a trade to the most recent quote that precedes the trade by at least 5 seconds. If a price is nearer the bid price it is classified as seller initiated and if it is closer to the ask price it is classified as buyer initiated. If a trade is at the midpoint of the bid-ask spread, it is classified based on the previous price. In this case, a tick test is used, that is, if the trade occurs at a price that is higher (lower) than the price of the previous trade, it is classified as buyer (seller) initiated.



AVOL alone might be misleading since it does not explain deviations in trading volume. Further insights are gained from ANETBUY which estimates trade direction to measure the risk avoidance behavior of different type of investors. Trading volume ANETBUY is defined as in equation (3) and calculated as total buy minus total sell divided by the standard deviation of total buy minus total sell calculated over the estimation period as follows:

$$ANETBUY = \frac{(Total\ Buy\ Trading\ Size - Total\ Sell\ Trading\ Size)}{STDeviation\ of\ (TBTS - TSTS)} \tag{3}$$

where TBTS stands for total buy trading size and TSTS stands for total sell trading size. We normalized raw trade initiation variables to determine the abnormal netbuy levels and to adjust for standard differences between small and large trade initiation patterns. We followed the procedure in equation (3) to calculate the test period values between restatement announcement day -4 and +20. An abnormally high level of buyer (seller) initiated trades indicates overall buying (selling) pressure and a positive (negative) reaction by stock traders.

Cumulative market adjusted abnormal return (CAR): The GAO (2002) report notes that restatement announcements result in substantial abnormal returns. Cumulative market adjusted abnormal returns (CARs) are calculated over various windows around the announcement date to observe buy and hold returns for different periods. The CAR of the  $i^{th}$  stock,  $CAR_{it}$  is obtained by subtracting the normal or expected return (R) in the absence of the event,  $E(R_{it})$  from the actual return in the event period as follows in equation (4):

$$CAR_{it} = R_{it} - E(R_{it}) \tag{4}$$

A market model equation is used to estimate the alpha and beta needed to calculate expected return value in equation (5).

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \tag{5}$$

where  $t = -250, \dots, -11$ ,  $\alpha_i$  is the constant term for the  $i^{th}$  stock,  $\beta_i$  is the market beta of the  $i^{th}$  stock,  $R_{mt}$  is the market return, and  $\epsilon_{it}$  is an error term in the regression.

We calculated CARs as in equation (6) for several different periods around the restatement announcement period to determine the effect of a restatement announcement on stock prices in different buy and hold scenarios.

$$CAR_{it} = R_{it} - estimated(\alpha_i) - estimated(\beta_i) * R_{mt} \tag{6}$$

where  $t$  interval is changed according to the desired CAR calculation.

Hribar and Jenkins (2004) also calculated CAR over various time spans. In our study the immediate market response is captured with CAR (-2, 2), CAR (-1, 0), CAR(-1,1), CAR(0,1), CAR(0,30), CAR (0,60), and CAR (-30, 30). Following Hribar et al. (2005), longer term responses is also calculated with CAR (-40,-3), CAR (-50,-3), CAR (-60,-3), CAR(-250, -3), CAR (3,30) and CAR(3,250)

### Empirical Methods and Analysis

Incremental trading response of small and large traders: Trading response around the announcement of an accounting restatement is a significant event for management, investors and regulators. The research method that we employ investigates day-by-day mean AVOL (abnormal trading volume) for companies making accounting restatements to determine incremental trading response of small and large traders. For large and small investors, daily AVOL (normal trading volume holding other things constant) is compared to AVOL on the announcement day to detect abnormal trading response from the mean. The event period spans day -4 to day 20 to investigate the trading behaviors of investors. Table 2 Panel A documents daily mean AVOL for both small and large investors over observation days (-1,3).

Prior to the announcement, we expect small investors to have larger AVOL than large investors because of their delayed response to the accounting restatement in comparison to large investors. A daily mean test compares mean AVOL for each observation day for each trader type. As expected, AVOL for small investors is bigger than for large investors and is significantly different from large traders' AVOL at the 1% level around announcement date<sup>9</sup>. This univariate result may not be conclusive about the relationship between investor type and trading volume because other firm characteristics also vary for each firm on average<sup>10</sup>. Therefore, the inferred relationship is next tested with a multivariate regression analysis controlling for differential firm characteristics.

<sup>9</sup> AVOL for small and large investors are highly skewed. Skewness is also found after the announcement date.

<sup>10</sup> For example, as seen in Table 2 Panel A, MSAVOL has a mean (median) 1.00 (0.48) that indicates a right skewed distribution. Average (median) MLAVOL is 0.44 (0.00) and on average MSAVOL is bigger than the MLAVOL. LNMVE has a mean (median) value of 4.61 (0.54). LNBNV has a mean (median) value of 0.69 (0.14). LNMB which is the natural logarithm of the market to book ratio has a mean (median) of 2.26 (2.10). Average (median) sales growth is 1.12 (1.06) which shows a 12% increase in sales over time. Leverage mean (median) is 0.45 (0.43) indicating total debt is 45% of total equity. MAR which is one plus the market-adjusted stock return for the fiscal year has an average (median) value of 1.05 (0.89) which indicates on average restated firms have a positive return of 5%. CORR is the correlation between annual stock return and earnings per share and the average (median) value is 0.20 (0.23) which shows a positive correlation between earnings and stock return which is consistent with the MAR measure. On average (median) 11.23 (8.00) analysts follow restated firms. Error is the forecast errors of the analyst and it has a mean (median) value of -0.06 (-0.01) which indicates that on average analysts estimate lower performance than the actual one. Stdrevise, the standard deviation of forecast revision, has a mean (median) value of 0.04 (0.02) which is a small standard deviation from the mean compared to (Bens and Monahan, 2004). Table 2 Panel B reports the correlation table for control variables which are significantly correlated with each other at conventional levels.

Table 2

Panel A: Descriptive statistics of the sample

Variable	Number of Observation	Mean	STD	Median
<i>MSAVOL</i>	275	1.00***	7.29	0.48
<i>MLAVOL</i>	275	0.44***	6.80	0.00
<i>LMVE</i>	275	4.61***	13.80	0.54
<i>LBV</i>	275	0.69***	2.52	0.14
<i>LMB</i>	275	2.26	6.48	2.10
<i>SALESGROWTH</i>	275	1.12***	0.57	1.06
<i>LEV</i>	275	0.45***	0.23	0.43
<i>MAR</i>	275	1.05***	0.96	0.89
<i>CORR</i>	275	0.20***	0.49	0.23
<i>FOLLOW</i>	275	11.23***	10.11	8.00
<i>ERROR</i>	275	-0.06***	0.27	-0.01
<i>STDREVISE</i>	275	0.04***	0.06	0.02

Notes:

1. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05 and 0.10 levels respectively.
2. The sample contains 275 restatement announcements between 1997 and 2002.

Variable Definitions:

MSAVOL is mean AVOL in days (-1,3) around the restatement date for small investors. MLAVOL is the same variable for large investors. AVOL is daily volume of trades in the event period minus mean daily volume of traders in estimation period (-60,-5) divided by standard deviation of trades in estimation period. LMVE is the natural logarithm of market value of common equity. LBV is the natural logarithm of book value of common equity. LMB is the natural logarithm of market to book ratio calculated by MVE divided by BV. SALESGROW is current year sales divided by prior-year-sale. LEV is LEVERAGE which is defined as book value of long-term liabilities plus short-term liabilities deflated by total asset. MAR is one plus the market-adjusted stock return for the fiscal year that is calculated from CRSP daily database. CORR is historical correlation between annual stock returns and earnings per share-EPS computed over the preceding 10 years. FOLLOW is an average monthly analyst following per IBES in a year. ERROR is the negative of the absolute value of the IBES consensus analyst forecast error divided by stock price at the beginning of the year. STDREVISE is a standard deviation of changes over the fiscal year in the median IBES forecast from the preceding month and divided by stock price at the beginning of the year.

Table 2

Panel B: Pearson Product Monet (Lower left) and Spearmen (Upper right) Correlations between the control variables

	SALES GROW	LEV	MAR	CORR	FOLLO W	ERROR	STDRE VISE	LMVE	LMB
SALESGROW		-0.127*	0.563*	0.010*	0.027*	-0.101*	-0.010*	0.058*	0.176*
LEV	-0.152*		-0.098*	0.018*	-0.078*	0.231*	0.087*	-0.003*	0.076*
MAR	0.262*	-0.105*		0.023*	0.100*	-0.103*	-0.204*	0.178*	0.243*
CORR	0.008*	0.092*	0.010*		0.018*	0.087*	0.106*	-0.048*	-0.125*
FOLLOW	0.037*	-0.086*	0.030*	0.026*		-0.097*	-0.043*	0.431*	0.167*
ERROR	-0.093*	0.117*	-0.113*	0.113*	-0.100*		0.542*	-0.176*	-0.169*
STDREVISE	-0.097*	0.164*	-0.101*	0.095*	-0.090*	0.787*		-0.124*	-0.053*
LMVE	0.072*	-0.029*	0.276*	-0.050*	0.732*	-0.242*	-0.225*		0.275*
LMB	0.251*	0.052*	0.311*	-0.038*	0.222*	-0.092*	-0.071*	0.389*	

Notes:

1. \* indicates significance at 1% level
2. The sample contains 275 restatement announcements between 1997 and 2002.
3. Variable definitions are provided at the previous tables.

Table 3 Panel A presents abnormal trading volume reactions around restatement announcement dates. For small investors, mean AVOL on all days starting at -4 to day 20 are significantly different than their average expected AVOL for the same number of days at the 1% level. Mean AVOL(SMALL) is highest on days 0 and 1 and then decreases afterwards. Figure 1 graphs this trading pattern and appears to indicate that small investors are surprised by restatement announcements and they responded to this "new information" by increasing their trades significantly in comparison to their normal trading patterns.

FIGURES

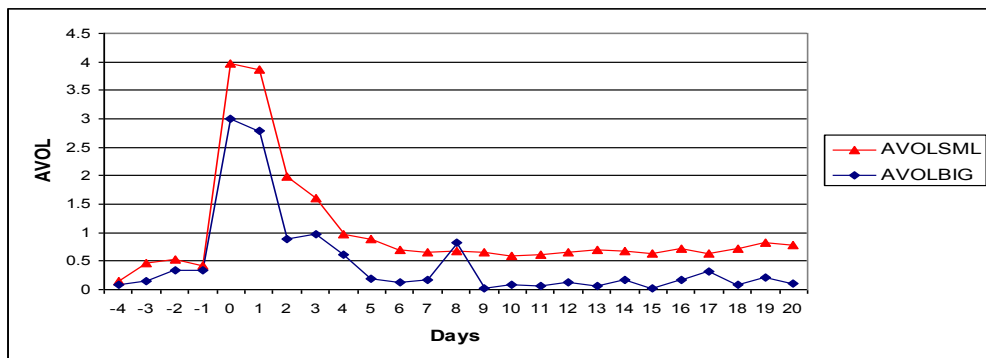


Figure 1: AVOL Around the Announcement Date for Small and Large Traders

Large traders, by contrast, respond significantly different than their expected trading size only on day -1, 0, 1, and 2 with mean AVOL of 0.343, 2.994, 2.795, 0.877 and 0.620 respectively. The trading behavior of large traders suggests that big investors are not surprised from restatement announcement news. Large traders do not respond differently on days other than -1 through 2 presumably because they interpret restatement characteristics with more accuracy than do small investors. Since they trade before the event window they may do less trading in the window. Time series characteristics of large and small traders are reported in Table 3 Panel B. Small traders have a significantly larger response to restatements than do larger traders. However, neither small nor large traders exhibit any trend in trading behavior.

**Table 3** Trading volume

**Panel A:** Trading volume around the date of restatement announcement

Day	Mean AVOL(SML)	Mean AVOL(LARGE)	Small-Large
-4	0.154**	0.088	0.067
-3	0.456***	0.157	0.298
-2	0.525***	0.348	0.176
-1	0.431***	0.343**	0.087
0	3.979***	2.994**	0.985
1	3.863***	2.795**	1.068
2	1.977***	0.877**	1.099***
3	1.611***	0.981	0.630
4	0.981***	0.620*	0.360
5	0.877***	0.194	0.683***
6	0.690***	0.118	0.571***
7	0.645***	0.159	0.486***
8	0.679***	0.829	0.596***
9	0.662***	0.013	0.649***
10	0.589***	0.094	0.496***
11	0.606***	0.064	0.542***
12	0.648***	0.119	0.384***
13	0.702***	0.069	0.632***
14	0.681***	0.162	0.519***
15	0.632***	0.016	0.615***
16	0.714***	0.173	0.540***
17	0.642***	0.320	0.322
18	0.725***	0.078	0.647***
19	0.820***	0.206	0.614**
20	0.773***	0.098	0.675***

Panel B: Mean AVOL by year

Year	N	AVOL (SML)	AVOL (LARGE)
1997	17	1.012***	0.202
1998	14	7.058*	2.768
1999	48	1.345***	0.563***
2000	51	5.376***	3.821***
2001	102	0.835***	0.598***
2002	43	1.220***	0.698***

**Notes:**

1. \*\*\*, \*\*, and \* indicate significance at the 0.01, 0.05 and 0.10 levels respectively.
2. The sample contains 275 restatement announcements between 1997 and 2002.

**Variable Definitions:**

AVOL(SML) indicates mean AVOL for small traders, and AVOL(LARGE) mean AVOL for large traders.

Impact of prompters and reasons of restatement on investor's differential trading response: In this section we investigate whether small and large investor trading depends more on who prompts a restatement than on the reasons for the restatement.

Impact of prompters (initiators) of accounting restatement: Nine prompters of restatements according to the GAO (2002) report are (1) auditor initiated; (2) company voluntarily initiated; (3) company initiated according to FASB regulation; (4) company initiated according to SEC recommendation; (5) external parties such as Federal Reserve or media initiated; (6) FASB initiated; (7) NASDAQ initiated; (8) SEC initiated and (9) unknown or not specified because SEC filing does not clearly state who actually discovered the misstatement.

Prompter of a restatement may have impact on investor behavior because this information may have signaling value and may be used differently by various types of investors. Categorical variables for each of the nine types of restatement prompters are created to measure who prompted a restatement. To measure small and large investor response to restatements, average abnormal volume for large and small investors, MLAVOL and MSAVOL, are calculated as stated earlier. These measures are calculated as in equations (7a and 7b) between day -1 and 3. These variables represent average AVOL for each investor type. These variables summarize the investors' response to restatements.

$$MLAVOL = \frac{\sum_{t=-1}^3 AVOL(Large)_t}{5} \tag{7a}$$

$$MSAVOL = \frac{\sum_{t=-1}^3 AVOL(Small)_t}{5} \tag{7b}$$

After calculating the mean trading behaviors of different types of investors, regressions models are run with MSAVOL and MLAVOL as dependent variables and the nine categorical variables of prompters as independent variables. Other forces are known to affect the behavior of large and small traders. Bens and Monahan (2004) introduces control variables for firm capital structure, performance, and the information environment. These additional control variables are introduced into the multivariate analysis. Capital structure is measured by leverage (LEV) which is total debt divided by total equity; firm performance is measured by sales growth (SALESGROWTH) which is calculated as current year sales divided by prior year sale and by market adjusted stock returns (MAR) which is one plus the market-adjusted stock return for the fiscal year; and the information environment is measured by the correlation between annual stock return and earnings per share (CORR) computed over the preceding 10 years, number of analyst following a company (FOLLOW) is the average monthly number of analyst following a company for the fiscal year, forecast error (ERROR) *ERROR* is the negative of the absolute value of the IBES consensus analyst forecast error divided by stock price at the beginning of the fiscal year, and the standard deviation of earnings forecast revisions (STDREVISE) is the standard deviation of changes over the fiscal year in the median analysts' forecast from the preceding month divided by stock price at the beginning of the fiscal year. These firm control variables characteristics such as the information environment, performance measures, and capital structure as in equation 8a and 8b below<sup>11</sup>.

$$MLAVOL = a_0 + \sum_{i=1}^{i=9} a_i \sum_{j=1}^{j=275} \sum_{t=1997}^{t=2002} Pdum_{i,j,t} + a_{12}LMVE + a_{13}LMB + a_{14}SALESGROW + a_{15}MAR + a_{16}CORR + a_{17}FOLLOW + a_{18}STDREVISE + error \tag{8a}$$

<sup>11</sup> Capital structure proxies the principal-agent issue at the firm.

$$MSAVOL = a_0 + \sum_{i=1}^{i=9} a_i \sum_{j=1}^{j=275} \sum_{t=1997}^{t=2002} P dum_{i,j,t} + a_{12}LMVE + a_{13}LMB + a_{14}SALESGROW + a_{15}MAR + a_{16}CORR + a_{17}FOLLOW + a_{18}STDREVISE + error$$

(8b)

where LMVE is natural logarithm of market value of equity which is calculated as closing price of the stock at the end of the year multiplied by number of shares outstanding. LMB is natural logarithm of the market to book (market value of equity divided by book value of equity) ratio. Table 4 Panel A contains estimates for MLAVOL (Mean Large traders' AVOL) and MSAVOL (Mean Small traders' AVOL) and coefficient estimates from estimating equation (8a) and (8b) and other regression statistics. The difference between small and large investor's values is significant at the 1% level.

Small investors treat company induced restatements and those labeled as unknown as the most important. The multivariate regression for small investors finds that the categorical variables for the initiator of restatements P dum2 (company voluntary initiated restatement prompter), P dum3 (company prompted on the advice of the FASB), and P dum9 (unknown prompter) have coefficient estimates of 5.083, 1.160 and 2.039 respectively, all of which are statistically significant at the 5% level.

The corresponding result for large investors is somewhat different. With MLAVOL as the dependent variable most of the restatement indicator variables are significant determinants of AVOL. P dum2 (company voluntary initiated) with an estimated coefficient of 1.642, P dum3 (company/FASB initiated) with an estimated coefficient of 0.933, and P dum7 (NASDAQ) with an estimated coefficient of 2.382 are all significant at 1% level. P dum4 (company/ SEC initiated) with a coefficient estimate of 1.028 and p dum9 (unknown) with the coefficient of 0.742 are significant at a 5% level. , P dum1 (auditor initiated restatement) with an estimated coefficient of 2.469 and P dum8 (SEC initiated) with a coefficient of 0.749 are significant at a 10% level. These results appear to indicate that large investors value knowing exactly who is prompting restatements; they appear to be less interested in knowing about external and FASB initiations. In summary, as seen in the last column in Table 4, with all control variables included, large investors are affected by almost all, seven out of nine, types of restatement prompters. On the other hand, for small investors with MSAVOL as the dependent variable only three out of nine types of prompters have significant coefficient estimates. For models explaining large and small



trader behavior, coefficient estimates are generally positive and adjusted R-squares range between 4% and 15%.

Impact of reasons for accounting restatements: We examine whether investor's trading is influenced by who prompted the restatement. Our analysis starts by introducing the reasons for the restatement. As noted above there are 11 reasons identified by the GAO why firms restate. They are (1) Cost/expense, (2) IPR&D, (3) Loan-loss, (4) Other, (5) reclassification, (6) related party transaction, (7) restructuring, (8) revenue recognition, (9) securities related, (10) tax related and (11) unspecified.

Table 4 Panel B contains regression results when the differential trading response of investors are regressed against the 11 reasons for restatements. The 11 reasons are included in the regression model as categorical variables similar to the earlier prompters analysis. Seven additional variables are included in the model to control for individual firm characteristics similar to those used in the prompter regressions in table 4 Panel A. The regression equations including the 11 categorical variables describing the reasons for restatements on large and small investors are :

$$MLAVOL = a_0 + \sum_{i=1}^{i=11} a_i \sum_{j=1}^{j=275} \sum_{t=1997}^{t=2002} rdum_{i,j,t} + a_{12}LMVE + a_{13}LMB + a_{14}SALESGROW + a_{15}MAR + a_{16}CORR + a_{17}FOLLOW + a_{18}STDREWISE + error$$

(9a)

$$MSAVOL = a_0 + \sum_{i=1}^{i=11} a_i \sum_{j=1}^{j=275} \sum_{t=1997}^{t=2002} rdum_{i,j,t} + a_{12}LMVE + a_{13}LMB + a_{14}SALESGROW + a_{15}MAR + a_{16}CORR + a_{17}FOLLOW + a_{18}STDREWISE + error$$

(9b)

where Rdum is a reason dummy for each reason why firms' restate their financial statements. The value of reason dummy equals one for a specific reason and zero otherwise. Other control variable definitions have already been provided at the previous section. Large investor trading behavior is influenced by the reason for the restatement as seen in Table 4 Panel B. Statistically significant positive coefficients are estimated for 3 of 11 categorical variables for large investors. A positive coefficient on these categorical variables indicates that the reason increases investor's average trading volume. Rdum2 (R&D), Rdum4 (Other) and Rdum8 (Revenue recognition) are all statistically significant

determinants of large investor trading volume. Of the other seven variables included in the regression only MAR is significant.

For small investors, only 1 out of 11 coefficients estimated on the categorical variables is marginally statistically significant (lost-loan) at the 10% level. The significance of the seven non categorical variables is not conclusive. Comparing Table 4 Panel A with Panel B, small investors appear to give more importance to who has motivated the restatement than to the reason for the restatement, while larger investors are influenced by both types of causes. These results support our contention about a differential trading response between small and large traders.

Small investor overreaction to restatements may be explained by their lack of knowledge. Since large investors consider both who initiated and the reasons for the restatement suggests a) that the two factors bring different and unique signals to the market and b) that these signals are valued differently by different investor classes.

Comparing adjusted R-squares for the two types of regressions (who prompted and the reason) indicates that small investors give more importance, based on the absolute size of the R-square, to who prompted a restatement than to the reason for the restatement. The opposite conclusion appears to hold for large traders. That is, they give attention to both reasons and prompters. These empirical findings support Kim and Verrecchia's (1991) theory regarding the different interpretation to the same information of various classes of investors.

**Table 4**

**Panel A:** Multivariate Analysis for Prompters

	MSAVOL	MLAVOL	MSAVOL	MLAVOL	MSAVOL	MLAVOL
Variable	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)
Auditor	10.591 (1.41)	1.110 (0.81)	9.200 (1.54)	2.313* (1.87)	9.297 (1.54)	2.469* (1.90)
Company	5.438*** (3.00)	0.107 (0.21)	4.974*** (2.62)	1.502*** (2.86)	5.083** (2.52)	1.642*** (2.90)
Company/FASB	2.376** (1.89)	-0.520 (-1.26)	1.021** (2.07)	0.756*** (3.35)	1.160** (1.98)	0.933*** (4.98)
Company/SEC	3.808*** (2.62)	-0.285 (-0.63)	2.038 (1.47)	0.947** (2.46)	2.109 (1.54)	1.028** (2.53)
External	2.366 (1.24)	-1.113** (-2.17)	3.219 (1.23)	0.454 (0.89)	3.284 (1.20)	0.0585 (1.14)
FASB	1.039 (0.95)	-1.411*** (-4.51)	0.895 (0.56)	-0.892 (-1.56)	0.745 (0.85)	-0.845 (1.14)
NASDAQ	1.552 (0.95)	0.023 (0.56)	1.880 (0.82)	1.802*** (3.04)	2.325 (0.84)	2.382*** (2.89)
SEC	2.414** (2.25)	-0.708** (-2.03)	1.720 (1.57)	0.678* (1.92)	1.779 (1.58)	0.749* (2.10)
Unknown	2.659** (2.21)	-0.711* (-1.89)	1.974* (1.85)	0.668** (2.13)	2.039** (1.84)	0.742** (2.25)
LMVE	-0.265 (-1.36)	0.085 (1.19)	-0.118 (-0.32)	0.061 (0.55)	-0.127 (-0.31)	0.075 (0.67)
LMB	0.840 (1.43)	0.094 (0.64)	0.941 (1.47)	0.136 (0.87)	0.944 (1.47)	0.136 (0.88)
SALESGROW			0.545 (0.46)	-0.055 (-0.19)	0.532 (0.44)	-0.046 (-0.16)
MAR			-0.858** (-1.86)	-0.172* (-1.77)	-0.854* (-1.84)	-0.168* (-1.72)
LEV			-0.365 (-0.15)	-0.029 (-0.05)	-0.287 (-0.12)	-0.008 (-0.01)
CORR			-3.157* (-1.83)	-0.522 (-1.38)	-3.164* (-1.80)	-0.551 (-1.45)
FOLLOW			-0.021 (-0.35)	0.008 (0.40)	-0.020 (-0.32)	0.007 (0.36)
ERROR					0.611 (0.44)	1.105* (1.90)
STDREVERSE					-0.386 (-0.61)	-0.445 (-1.61)
Adj R-square	0.089	0.044	0.146	0.060	0.147	0.064

**Notes:**

1. \* indicates significance at 1% level

2. For the panel estimation the t-statistics in parenthesis based on the Huber-White-Sandwich procedure for correcting the standard errors for time-series, serial-correlation (see Petersen, 2005).

**Variable Definitions:**

Pdums are set of dummy variables for prompters which are shown in table1 Panel B. They get the value of 1 if the prompter is that type of prompter 0 otherwise. E.g. if prompter is Auditor then pdum1 gets the value of 1 and value 0 otherwise.

**Table 4**

**Panel B: Multivariate Analysis for Reasons**

Variable	MSAVOL	MBAVOL	MSAVOL	MBAVOL	MSAVOL	MBAVOL
	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)
Cost/Expense	0.912 (1.18)	0.341 (1.29)	0.249 (0.23)	0.295 (1.04)	0.296 (0.27)	0.215 (0.77)
IPR&D	0.949 (1.06)	0.512** (2.25)	2.028 (1.30)	0.850*** (2.68)	2.059 (1.32)	0.806** (2.32)
Loan-Loss	-0.487 (-1.10)	0.463*** (26.55)	-6.443* (-1.77)	-0.378 (-0.50)	-6.39* (-1.76)	-0.438 (-0.57)
Other	3.189* (1.79)	1.449** (2.16)	3.168* (1.77)	1.501** (2.08)	3.196* (1.81)	1.464** (2.00)
Reclassification	1.785 (1.35)	0.556* (1.74)	1.003 (0.56)	0.482 (1.06)	1.001 (0.56)	0.484 (1.00)
Rel. Party Tm.	2.147 (1.38)	1.602* (1.70)	1.160 (0.56)	1.578* (1.67)	1.225 (0.59)	1.494 (1.54)
Restructuring	1.638 (1.41)	0.427 (1.48)	0.613 (0.46)	0.331 (1.11)	0.679 (0.50)	0.226 (0.68)
Revenue Rec.	2.972* (1.90)	1.116*** (2.67)	2.160 (1.54)	1.074*** (2.89)	2.196 (1.56)	1.027*** (2.65)
Securities Rel.	0.589 (0.58)	0.084 (0.37)	1.111 (0.74)	0.234 (0.68)	1.175 (0.78)	0.159 (0.42)
Tax Related	0.012 (0.56)	0.011 (0.98)	0.425 (0.85)	0.315 (0.94)	0.256 (0.78)	0.006 (0.82)
Unspecified	3.872 (1.24)	3.124 (1.15)	4.845 (1.49)	3.576 (1.34)	4.912 (1.51)	2.498 (1.31)
LMVE	-0.396 (-1.46)	0.039 (0.53)	-0.292 (-0.70)	0.010 (0.09)	-0.299 (-0.66)	0.032 (0.28)
LMB	0.779 (1.21)	0.086 (0.58)	0.907 (1.39)	0.147 (0.94)	0.907 (1.38)	0.146 (0.92)
SALESGROW			0.639 (0.52)	0.195 (0.06)	0.631 (0.50)	0.041 (0.13)
MAR			-1.196* (-1.96)	-0.316** (-1.97)	-1.197* (-1.96)	-0.318** (-1.94)
LEV			1.324 (0.56)	0.324 (0.57)	1.295 (0.54)	0.327 (0.57)
CORR			-3.324* (-1.76)	-0.475 (-1.17)	-3.313* (-1.74)	-0.494 (-1.22)
FOLLOW			-0.004 (-0.06)	0.013 (0.62)	-0.003 (-0.05)	0.011 (0.53)
ERROR					-0.500 (-0.33)	0.747 (1.31)
STDREVISE					0.190 (0.26)	-0.200 (-0.80)
Adj R-Square	0.032	0.047	0.099	0.072	0.099	0.075

**Notes:**

1. \* indicates significance at 1% level
2. For the panel estimation the t-statistics in parenthesis based on the Huber-White-Sandwich procedure for correcting the standard errors for time-series, serial-correlation (see Petersen, 2005).

**Variable Definitions:**

Rdums are set of dummy variables for reasons of restatement which is shown in table1 Panel B. They get the value of 1 if the reason is that type of reason 0 otherwise. E.g. if reason of restatement is Cost/Expense then Rdum1 gets the value of 1 and value 0 otherwise.

**NETBUY Activities of Small and Large Investors**

Table 5 shows selling and buying behaviors of different classes of investors i.e. large and small. Net buy measures the direction of trades and has a positive value if the buying exceeds the selling. As seen in Panel B of Table 5, small investors buy 3 days prior to restatements, and buy again after the restatement at days 9 and 14. Interestingly, large investors significantly buy also 3 days prior to a restatement announcement, and after the restatement at days 4, 17 and 20. The other trading days trading behaviors are not significant. Comparing small and large traders on day 4, large traders buy more than small traders while on day 9, small investors buy more than large investors; this may be the response of small investors to large investors excessive buying behavior at day 4. The other trading days are not significantly different from each other for small and large investors according to our net buy analysis.

**Table 5**

**Panel A:** Net Buy Activities of Small and Big Investors' Around the Date of Restatement Announcement Day

	Mean Netbuy-Small	Mean Netbuy-Large	Mean Small-Large
-4	0.033	0.240	-0.206
-3	0.091*	0.191*	-0.009
-2	0.064	0.075	-0.010
-1	-0.014	0.059	-0.738
0	-0.051	-0.509	0.458
1	0.146	0.249	-0.102
2	0.111	0.043	0.068
3	0.074	-0.158	0.232
4	0.016	0.444*	-0.430*
5	-0.051	-0.016	-0.035
6	-0.014	0.052	-0.066
7	0.035	0.099	-0.065
8	0.027	0.094	-0.067
9	0.154***	-0.041	0.195*
10	-0.041	-0.053	0.012
11	0.016	0.106	-0.089
12	-0.236	-0.434	0.197
13	0.064	0.156	-0.093
14	0.100*	0.258	-0.158
15	0.025	-0.105	0.129
16	-0.065	-0.003	-0.061
17	0.090	0.188**	-0.097
18	-0.057	-0.115	0.057
19	-0.166	0.295	-0.461
20	-0.166	0.230*	-0.396

**Notes:**

1. \*\*\*,\*\* and \* indicate significance at 1%, 5% and 10% levels respectively.
2. The sample contains 275 restatement announcements between 1997 and 2002.

**Variable Definitions:**

Net buy is calculated as total buy minus total sell in the trading day divided by average total buy plus total sell calculated in the estimation period (-60,-5).

Table 5 Panel B documents the abnormal trading behaviors for small and large traders. ANETBUY takes into consideration normal trading behaviors of investors before the restatement announcement. According to Panel B, small trader's ANETBUY are positive on days 1, 2 and 9 just after the announcement day. Small investors appear to make abnormally buys after the announcement day. The reason for this buying behavior may be decreased price of restated companies stocks. On the other hand large traders sell abnormally at the restatement day which may explain why stock prices of restated companies decrease. Interestingly large traders buy abnormally more at days 17 and 20. This may show large traders repositioning back into restated company's stocks because bad events did happen, and their recurrence is unlikely in the near future. This result supports Platt's (2006) contention of mean reversion of stock prices. Comparing mean abnormal trading behaviors of small and large trader we observe that large traders sell more on the announcement day, and on day 7, but they they buy more at trading day 9. Other trading days are not significantly different from each other for small and large investors

Table 5

**Panel B:** Abnormal Net buy activities of small and big investors around the date of restatement announcement

Day	Mean AVOL Netbuy Small	Mean AVOL Netbuy-Large	Mean Small-Large
-4	-0.126	0.003	-0.130
-3	-0.050	-0.048	0.001
-2	-0.072	0.084	-0.161
-1	-0.081	-0.009	-0.072
0	0.432	-0.671**	1.145**
1	0.475*	0.351	0.103
2	0.442**	0.226	0.202
3	0.133	0.214	-0.095
4	-0.045	0.139	-0.192
5	-0.137	0.019	-0.158
6	-0.140	-0.014	-0.125
7	-0.220*	0.072	-0.298*
8	-0.101	-0.068	-0.028
9	0.228*	-0.131	0.367**
10	-0.054	0.004	-0.057
11	0.097	-0.021	0.119
12	-0.174	-0.006	-0.168
13	0.067	-0.077	0.148
14	0.102	-0.147	0.257
15	-0.016	0.037	-0.055
16	-0.174	-0.002	-0.172
17	0.004	0.196**	-0.205
18	-0.051	-0.114	0.071
19	-0.002	0.015	-0.018
20	-0.072	0.209*	-0.295

**Notes:**

1. \*\*\*, \*\* and \* indicate significance at 1%, 5% and 10% levels respectively.
2. The sample contains 275 restatement announcements between 1997 and 2002.

**Variable Definitions:**



AVOLNet buy is calculated as total buy minus total sell in the trading day divided by average total buy minus total sells divided by standard deviation of total buy minus total sales calculated in the estimation period (-60,-5).

Figure 2 graph the abnormal netbuy trading behaviors of small and large traders. According to this figure small investors buy abnormally starting day -1 to 3, and then start selling from day 4 to 8. Starting on day 9 their buying behaviors are mixed. Large traders sell significantly at the announcement day, and day 17. They start buying at day 1, 2, 3, 4 then they do not buy or sell significantly until day 17 which is consistent with risk avoidance and waiting for the realization of their expectations.

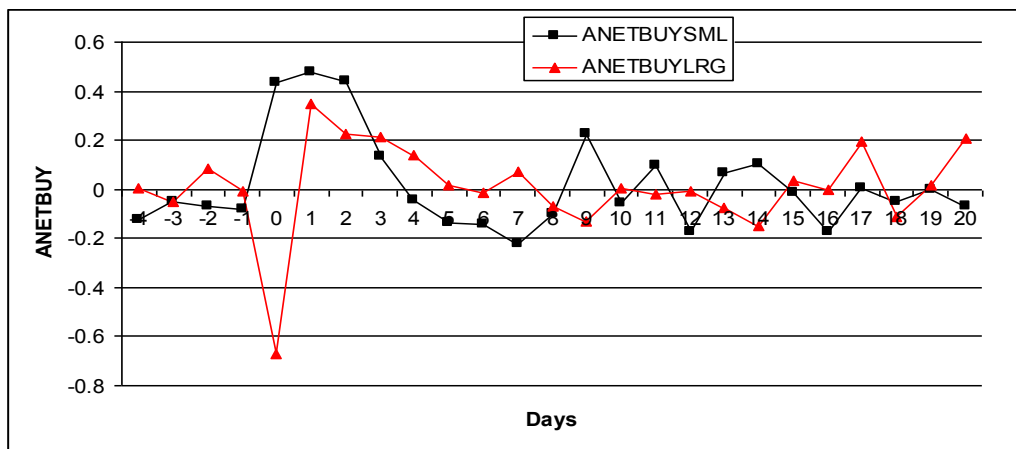


Figure 2: ANETBUY Around the Announcement Date

**Transaction Size and Investors' Classification**

The literature reports that large investors are more sophisticated, and trade accordingly. Cready (1988) noted a higher mean transaction size around earning announcement-periods compared to non-announcement periods. He attributed that result to a greater relative trading response by wealthier (large) investors than by small investors. His finding is consistent with Ohlson's (1975) proposition that information value increases with investor wealth. Hribar and Jenkins (2004) found abnormally high trading in a short announcement window of 5 days. Palmrose et al. (2004) report similar results for 2 day trading windows. Overall, prior research suggests that compared to small investors, large sophisticated investors are more concerned about the predictability of future

earnings and dislike uncertainty. Large investors resolve this need by using more sophisticated estimation techniques.

Cready (1988) argued that size-related differences in announcement of accounting restatement usage rates are reflected in announcement-day daily mean transaction size. Mean transaction size (MTR) is calculated for small and large investors by dividing the number of shares traded per day by the number of transactions per day following Cready (1988) as seen in equations (10a and 10b).

$$MTR (Small)_{it} = \text{Shares traded by small investors} / \# \text{ of transaction per day} \tag{10a}$$

$$MTR (Large)_{it} = \text{Shares traded by large investors} / \# \text{ of transaction per day} \tag{10b}$$

Calculated values of MTR are then explained as a function of trading day during the year (values between 1 and 261) to be able to determine expected MTR for each investor type (Equation 11a and 11b).

$$MTR (Small)_{it} = a_i + b_i(DAY_t) + e_{it} \tag{11a}$$

$$MTR (Large)_{it} = a_i + b_i(DAY_t) + e_{it} \tag{11b}$$

where

$MTR (Large)_{it}$ : the mean transaction size in shares for transactions occurring in firm i's stock on day t for large investor group.

$MTR (Small)_{it}$ : the mean transaction size in shares for transactions occurring in firm i's stock on day t for small investor group.

$DAY_t$ : The day of trading per the daily CRSP tape i.e. numbering the trading days starting from January from 1 to 255, then using that number as the value for DAY variable.

$a_i, c_i$  : intercepts

$b_i, d_i$  : slope term for firm i; and

$e_i$  error term

Following Cready and Mynatt (1991), mean transaction size is estimated using 201 days of data centered on the restatement's announcement date after which "Unexpected Mean Transaction Size" (UMTR) is calculated for large and small investors by differencing expected MTR (derived from equations (11a and 11b) from actual MTR (equations 10a and 10b).

$$UMTR (Small)_{it} = MTR (Small)_{it} - expected(MTR (Small)_{it}) \quad (12a)$$

$$UMTR (Large)_{it} = MTR (Large)_{it} - expected(MTR (Large)_{it}) \quad (12b)$$

where

UMTR (Small): Unexpected mean transaction size in shares for transactions occurring in firm  $i$  on day  $t$  for the small investor group.

UMTR (Large): Unexpected mean transaction size in shares for transactions occurring in firm  $i$ 's stock on day  $t$  for the big investor group.

Unexpected mean number of transactions is calculated daily from day -9 to day +10 around the restatement announcement date. These data are stratified by transaction size. Table 6 panels A and B report mean transaction response and unexpected mean transaction response of different type of investors respectively. Mean transaction response residuals for each investor type are reported in Table 6 Panel A. Unexpected mean transaction response residuals for each investor group are derived from time-series regressions where the dependent variables are daily mean transaction size in shares calculated for large and small investor; the independent variable is trading day (per CRSP day of the trade). A mean test, shown in Table 6 panel B, is used to test whether number of mean UMTR for small investors are larger than the number of UMTR for all investors. We find significant differences between small investors and all other investor types. The significant mean test result lends support to the idea that small investors trade more intensively around the restatement announcement in comparison to other investors. In summary we find that small traders have different mean transaction response around the restatement announcement event window than other investors.

**Table 6**  
**Panel A: Mean Unexpected Numbers of Transaction**

	MUNT			
	Small	Small	Large	Large
	mean	Median	mean	Median
-10	-0.07*	-0.02	-0.21***	-0.15
-9	-0.08*	-0.01	-0.08	-0.08
-8	-0.02	0.00	-0.15***	-0.10
-7	-0.07**	-0.01	-0.04	-0.06
-6	-0.08**	-0.02	-0.01	-0.07
-5	-0.13***	-0.03	-0.14**	-0.09
-4	-0.16***	-0.01	-0.28***	-0.16
-3	0.03	0.00	-0.08	-0.08
-2	-0.08*	0.00	-0.18***	-0.12
-1	-0.05	0.00	-0.24***	-0.17
0	0.03	0.00	0.07*	-0.03
1	0.12***	0.01	0.11**	0.00
2	0.20***	0.02	0.09*	0.00
3	0.02	0.00	0.01	-0.03
4	0.03	0.00	0.02	-0.02
5	-0.05	0.00	0.05	-0.03
6	0.05	0.00	-0.11**	-0.09
7	0.07***	0.00	-0.03	-0.06
8	0.02	0.00	-0.04	-0.08
9	-0.01	0.00	0.08	-0.02
10	0.10**	0.01	0.05	-0.06

**Notes:**

\*\*\*, \*\*, \* statistically significant at 1%, 5% and 10% respectively.

**Variable Definitions:**

$MTR (Small)_{it} = a_i + b_i(DAY_t) + e_{it}$  and  $MTR (LArge)_{it} = a_i + b_i(DAY_t) + e_{it}$  where  $MTR (Small)_{it}$  is the mean transaction size in shares for transactions occurring in firm i's stock on day t for the small investor group.  $MTR (LArge)_{it}$ : the mean transaction size in shares for transactions occurring in firm i's stock on day t for the Small investor group.  $DAY_t$  is the trading day per the daily CRSP tape.  $UMTR (Small)_{it} = MTR (Small)_{it} - expected(MTR (Small)_{it})$  and  $UMTR$

$(Large)_{it} = MTR (Large)_{it} - expected(MTR (Large)_{it})$  where  $UMTR(Small)$  is the unexpected mean transaction size in shares for transactions occurring in firm i's stock on day t for the small investor group.  $UMTR(Large)$  is the unexpected mean transaction size in shares for transactions occurring in firm i's stock on day t for the large investor group.

**Table 6**

**Panel B:** Unexpected Mean Transaction sizes in Shares at Announcement of Accounting Restatement

	Small mean	Small median	Large mean	Large Median
-10	-0.07*	-0.02	-0.21***	-0.23
-9	-0.08*	-0.01	-0.06	-0.12
-8	-0.02	0.00	-0.12***	-0.15
-7	-0.07**	-0.01	-0.05*	-0.13
-6	-0.08	-0.02	-0.01	-0.09
-5	-0.13***	-0.03	-0.01	-0.11
-4	-0.16***	-0.01	-0.15***	-0.15
-3	0.03	0.00	0.04	-0.03
-2	-0.08*	0.00	-0.07*	-0.13
-1	-0.05	0.00	-0.09**	-0.16
0	0.03	0.00	0.11***	-0.03
1	0.12***	0.01	0.19***	0.05
2	0.20***	0.02	0.10**	-0.06
3	0.02	0.00	0.03	-0.09
4	0.03	0.00	-0.02	-0.10
5	-0.05	0.00	0.06	-0.07
6	0.05	0.00	-0.10***	-0.13
7	0.07*	0.00	0.00	-0.11
8	0.02	0.00	0.03	-0.10
9	-0.01	0.00	-0.03	-0.12
10	0.10**	0.01	0.02	-0.12

**Notes:**

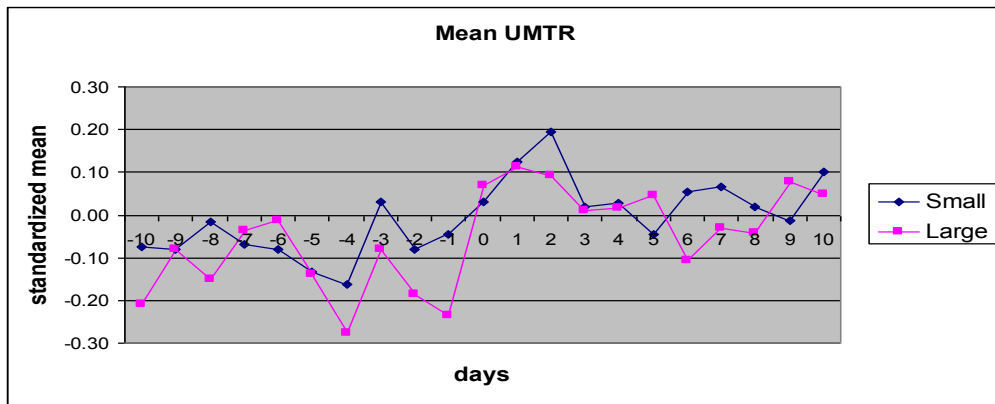
\*\*\*, \*\*, \* statistically significant at 1%, 5% and 10% respectively.

**Variable Definitions:**

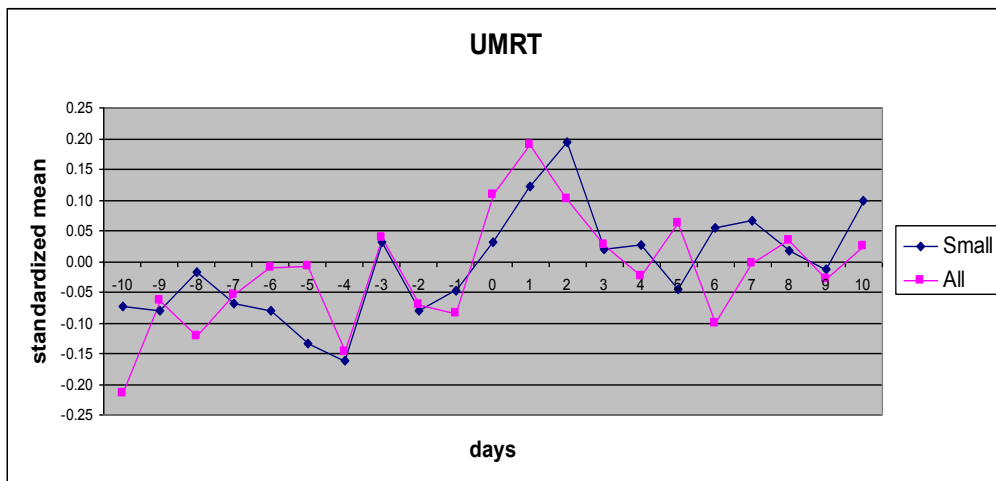
$MTR (Small)_{it} = a_i + b_i(DAY_t) + e_{it}$  and  $MTR (All)_{it} = a_i + b_i(DAY_t) + e_{it}$  where  $MTR(All)_{it}$  is the mean transaction size in shares for transactions occurring in firm i's stock on day t for the all investors.  $MTR (Small)_{it}$  is the mean transaction size in shares for transactions occurring in firm i's stock on day t for the small investor group.  $DAY_t$  is the trading day per the daily CRSP tape.  $UMTR (All)_{it} = MTR (All)_{it} - expected(MTR (All)_{it})$  and  $UMTR (Small)_{it} = MTR (Small)_{it} -$

$expected(MTR (Small))_t$  where  $UMTR(All)$  is the unexpected mean transaction size in shares for transactions occurring in firm  $i$ 's stock on day  $t$  for all investor group.  $UMTR (Small)$  is the unexpected mean transaction size in shares for transactions occurring in firm  $i$ 's stock on day  $t$  for the small investor group.

Figure 3 graphs unexpected mean transaction size around accounting restatement date. The graph indicates that small investors trade more around restatement announcements especially around days 2, 6, 7, and 10. The motivation for these trades may be a delayed response to the restatement announcement. Figure 4 graphs unexpected mean transaction shares around the restatement announcement date. The shape of the curve resembles Figure 3 which shows small traders' trading shares unexpectedly at days 2,4,6,7 and 10.



**Figure 3:** Unexpected Mean Transaction Size Around the Announcement of Accounting Restatement



**Figure 4:** Unexpected Mean Transaction Shares at Announcement of Accounting Restatement

Table 7 documents the Cumulative Abnormal Returns (CAR) for different time intervals in order to determine the market's reaction to announcements. We found -8.7% announcement return is found which is consistent with Hribar and Jenkins (2004). Findings are presented graphically in Figure 5 for CAR (-2,2). Negative significant results are found for all CAR intervals but the absolute value of these returns is decreasing in the longer windows. This suggests that over time investors reappraise their valuation of companies that restate their earnings. Investors may believe that a further restatement is a low probability event.. Firms that have not yet restated their earnings have a risk, in these investor's minds, of restating.

**Table 7:** Cumulative Abnormal Return

CAR	Mean	Median
(-250 to -3)	-0.270***	-0.230
(-60 to -3)	-0.088***	-0.076
(-50 to -3)	-0.084***	-0.084
(-40 to -3)	-0.079***	-0.074
(-2 to 2)	-0.087***	-0.046
(-30 to 30)	-0.144***	-0.160
(-1 to 0)	-0.037***	-0.045
(-1 to 1)	-0.078***	-0.038
(0 to 1)	-0.077***	-0.036
(0 to 30)	-0.100***	-0.079

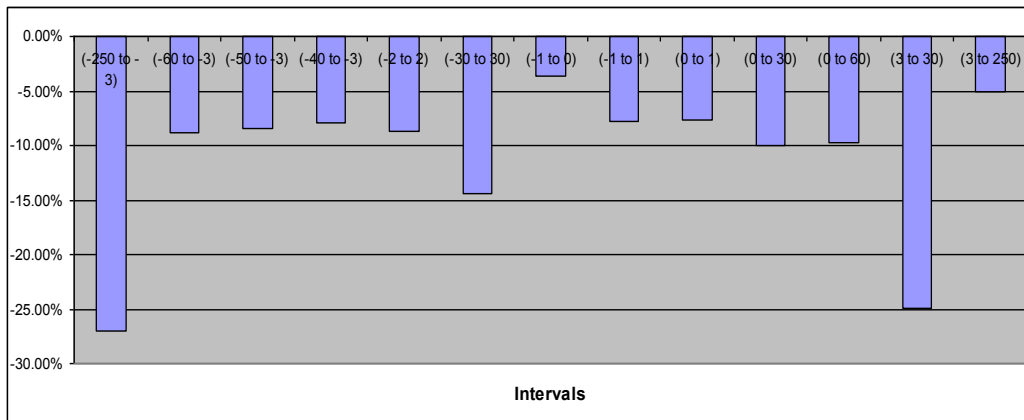
(0 to 60)	-0.097***	-0.118
(3 to 30)	-0.250***	-0.040
(3 to 250)	-0.051***	0.194

**Notes:**

\*\*\*, \*\*, \* statistically significant at 1%, 5% and 10% respectively.

**Variable Definitions:**

$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \epsilon_{i,t}$  where  $t = -250, \dots, -11$  where  $\alpha_i$  is a constant term for the  $i$ th stock is,  $\beta_i$  is the market beta of the  $i$ th stock,  $R_{m,t}$  is the market return, and  $\epsilon_{i,t}$  is an error term. The parameters of the model are estimated by using the time series data from the estimation period that precedes each individual restatement announcement. The estimated parameters are then matched with the actual returns in the restatement announcement period. Then the Cumulative abnormal returns are calculated as follows for different time period around the restatement announcement period.  $CAR_{i,t} = R_{i,t} - \exp(\alpha_i) + \exp(\beta_i) R_{m,t}$  where  $t$  interval changes according to desired  $CAR$  calculation.



**Figure 5:** Cumulative Abnormal Return in Different Intervals

**Conclusion**

This study provides evidence on the role of investor size (large vs. small) as it influences trading response to accounting restatements before and after the announcement date. Large and small investors appear to respond to accounting restatement announcements differently which may result from their disparate stock of information and mechanisms for using information. Large investors have access to alternative pre-disclosure information sources which may allow them to forecast accounting restatements and decrease their equity holdings before the announcement



date. This may explain the observed increased trading activity of large traders both before and after accounting restatements.

In addition, small and large traders have differential responses to a) who has prompted the restatement and b) to the reason for the restatement. Small investors appear to treat the initiator of the restatement as a significant piece of information and they appear to trade based on who has prompted the restatement. Small investors give less importance to the reasons for the restatement, possibly because they do not know how to use this information. On the other hand, large investors take into consideration both initiators and reasons for restatements while forming trading strategies. This result may relate to the sophistication of large traders, but it may also result from Kim and Verrecchia's (1991) observation that different classes of investors interpret the same public announcement differently.

## References

- Anderson, K.L. and Yohn, T.L.. 2002. "The effect of 10-K restatements on firm value, information asymmetries, and investors' reliance on earnings", Available at <http://ssrn.com/abstract=332380>.
- Asthana, S., Balsam, S. and Sankaraguruswamy, S.2004. "Differential Response of Small versus Large Investors to 10-K Filings on EDGAR", *The Accounting Review*, 79: 571-589
- Ball, R. and Brown, P. 1968. "An empirical evaluation of accounting numbers". *Journal of Accounting Research*, 6: 159-178.
- Beaver, W. H. 1968. "The information content of annual earnings announcements". *Journal of Accounting Research* 6: 67-92.
- Bens, D. A. and Monahan, S. J.2004. "Disclosure quality and excess value of diversification", *Journal of Accounting Research*, 42: 691-730.
- Bhattacharya, N.2001. "Investors' trade size and trading responses around earnings announcements: An empirical investigation", *The Accounting Review*, 76:221-244.
- Bushee, B. 1998. "The influence of institutional investors on myopic R&D investment behavior." *The Accounting Review*, 73:305-333.
-

- 
- Cready, W. M. 1988. " Information value and investor wealth: The case of earnings announcements", *Journal of Accounting Research*, 26:1-27.
- Cready, W.M. and Mynatt, P. G. 1991. " The Information content of Annual reports: A price and trading response analysis", *The Accounting Review*, 66: 291-312
- DeFond, M. and Park, C. 2001. " The reversal of abnormal accruals and the market valuation of earnings surprises". *The Accounting Review*, 76: 375-404.
- Demski, J. S. and Feltham, G. A. 1994. " Market response to financial reports", *Journal of Accounting and Economics*, 17: 3-40.
- Desai, H., Krishnamurthy, S. and Venkataraman, K. 2006. " Do short sellers target firms with poor earning quality? Evidence from earnings restatement", *Review of Accounting Studies*, 11: 71-90.
- Dhaliwal, D., Li, O. Z. and Xie, H. 2010. " Institutional investors, financial health, and equity valuation", *Asia-Pacific Journal of Accounting and Economics*, 17: 151-173.
- Easley, D. and O'Hara, M. 1987. "Price, trade size, and information in securities markets", *Journal of Financial Economics*, 19: 69-60.
- El-Gazzar, S. 1998. " Predisclosure information and institutional ownership: A cross-sectional examination of market revaluations during earnings announcement periods". *The Accounting Review*, 73: 119-29.
- GAO-03-138. 2002. " Financial Statement Restatements: Trends, market impacts, regulatory responses, and remaining challenges", *United States General Accounting Office*.
- Hakansson, N. H. 1977. " Interim disclosure and public forecast: an economic analysis and a framework for choice", *The Accounting Review*, 52: 396-416.
- Hasbrouck, J. 1988. "Trades Quotes, inventories and information", *Journal of Financial Economics*, 22: 229-252.
- Desai, H., Hogan, C. E. and Wilkins, M. S. 2006. " The Reputational Penalty for Aggressive Accounting: Earnings Restatements and Management Turnover", *The Accounting Review*, 81: 83-112.
- Hribar, P., Jenkins, N. 2005. " The effect of accounting restatements on earnings revisions and the estimated cost of capital". *Review of Accounting Studies*, 9:337-356.
- Hribar, P., Jenkins, N. 2004. "The effect of accounting restatements on earnings revisions and the estimated cost of capital". *Review of Accounting Studies*, 9: 337-356.
-

- Kim, O., and Verrecchia, R. 1991. "Trading Volume and Price Reactions to Public Announcements", *Journal of Accounting Research*, 29: 302-321.
- Jones, J. 1991. "Earnings management during import relief investigations" *Journal of Accounting Research*, 29: 93-228.
- Lee, C. 1992. "Earning News and small Traders: An intra-day analysis", *Journal of Accounting and Economics*, 15: 265-302.
- Lee, C. and Radhakrishna, B. 2000. "Inferring Investor Behavior: Evidence from TORQ data". *Journal of Financial Markets*, 3:83-111.
- Lang, M. and Lundholm, R. 1993. "Cross-sectional determinants of analyst ratings of corporate disclosures", *Journal of Accounting Research*, 31: 246-271.
- Lee, C.M.C., Mucklow, B. and Ready, M. J. 1993 "Spreads, Depths, and the Impact of Earnings Information: An Intraday Analysis", *Review of Financial Studies*, 2: 345-374.
- Lee, C.M. C., and Ready, M. J., 1991. "Inferring Trade Directions from Intraday Data", *Journal of Finance*, 46: 733-746.
- Odders-White, E. R. 2000. "On the Occurrence and Consequences of Inaccurate Trade Classification", *Journal of Financial Markets*, 3: 259-286.
- Ohlson, J.A., 1975. "The Complete ordering information alternatives for a class of portfolio selection Models", *Journal of Accounting Research*, 13: 267-82.
- Palmrose, Z-V, Richardson, V. J. and Scholz, S. 2004. "Determinants of Market Reactions to Restatement Announcements". *Journal of Accounting and Economics*, 37: 59-89.
- Platt, H. 2006. "Revisiting the Reversal of Large Stock-Price Declines", *Journal of Alternative Investment*, 9: 48-63.
- Walther, B. 1997. "Investor sophistication and market earnings expectations". *Journal of Accounting Research*, 35:157-79.
- Wilson, R. 1975. "Informational Economics of Scale", *Bell Journal of Economics*, 6: 184-95.
- Verrecchia, R. E. 1981. "On the relationship between volume and consensus of investors: Implications for interpreting tests of information content". *Journal of Accounting Research*, 19: 271-83.
-