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ABSTRACT

In recent years, many companies have emphasized adjusted-GAAP earnings numbers in their quarterly press releases. While managers use different names to describe these non-standard earnings metrics, the financial press frequently refers to them as "pro forma" earnings. Managers and other advocates of pro forma reporting argue that these disclosures provide a clearer picture of companies' core earnings. On the other hand, regulators, policymakers, and the financial press often allege that managers' pro forma earnings disclosures are opportunistic attempts to mislead investors. Recent evidence suggests that while many pro forma earnings disclosures are altruistically motivated, some may represent managers' attempts to portray overly-optimistic financial performance. If this is the case, less-wealthy, less-sophisticated, individual investors are arguably the most at risk of being misled. Consequently, this study investigates *who* trades on pro forma earnings information. Our intraday investigation of transactions around earnings announcements containing pro forma earnings information reveals that less-sophisticated investors' announcement-period abnormal trading is significantly positively associated with the magnitude and direction of the earnings surprise based on pro forma earnings. In contrast, we find no association between sophisticated investors' trading and manager-reported pro forma information. Overall, our analyses and numerous robustness tests suggest that the segment of the market that relies on pro forma earnings information is populated predominantly by less-sophisticated individual investors. This evidence is particularly relevant to standard setters and regulators given that Section 401(b) of the Sarbanes-Oxley Act of 2002 and subsequent SEC regulations are specifically designed to protect ordinary investors from misleading pro forma information.

Keywords: Pro forma earnings; corporate disclosure; The Sarbanes-Oxley Act of 2002; SEC regulations

Data Availability: The data are available from the public sources identified in the text.

I. INTRODUCTION

The managerial practice in recent years of reporting a non-standard, alternative profitability measure in the same press release with the audited earnings number has generated substantial controversy and debate. These alternative profitability metrics (popularly known as "pro forma" earnings) are GAAP earnings adjusted for items that managers deem to be transitory or non-representative of future earnings (Weil, 2001).[1] Managers defend this practice by asserting that pro forma earnings figures provide stakeholders a more accurate assessment of sustainable operating performance (i.e., a better measure of core earnings) than do standard GAAP earnings figures (Bray, 2001). On the other hand, policymakers, regulators, and the financial press often allege that pro forma earnings are incomplete, inaccurate, and misleading to investors (Derby, 2001; Dreman, 2001; Elstein, 2001). This debate highlights the possibility that, while some pro forma reports are altruistically motivated, others may represent managers' attempts to divert stakeholders' attention from poor operating performance by excluding bad news from GAAP earnings.[2]

Recent research examining market reactions to earnings announcements containing pro forma information provides evidence that investors often pay more attention to management-adjusted pro forma earnings numbers than to audited GAAP earnings figures (Bhattacharya, Black, Christensen, and Larson, 2003, hereafter BBCL; Lougee and Marquardt, 2004). Further, two recent experimental studies (Frederickson and Miller, 2004; Elliott, 2006) provide evidence that less-sophisticated investors are more likely to rely on pro forma information than more-sophisticated investors. Finally, a small but growing stream of research provides evidence that pro forma earnings information may be misleading to investors.

[1] Managers do not always label their adjusted-GAAP earnings numbers as "pro forma" income. Press releases often describe adjusted-GAAP earnings figures using terms such as cash earnings, core earnings, adjusted earnings, earnings excluding certain items, or earnings before certain items. Wallace (2002) provides an exhaustive list of common nomenclatures managers use to label their adjusted-GAAP earnings metrics. While our sample includes all of the various adjusted-GAAP earnings labels described by Wallace (2002), we refer to them throughout the paper using the terms "pro forma" or "adjusted-GAAP" earnings for ease of exposition.

[2] Prior research provides a more detailed discussion of this debate (e.g., Bhattacharya et al., 2003; Lougee and Marquardt, 2004; and Elliott, 2006, among others). While we only discuss this issue briefly, we emphasize that there has been considerable deliberation on both sides of the matter, and we believe both positions have merit. It is likely that managers often present pro forma earnings with a legitimate incentive to provide a clearer picture of recurring earnings. For example, Bhattacharya et al. (2003) find evidence that some of their pro forma disclosures contain adjustments where managers voluntarily exclude one-time gains. On the other hand, Bowen, Davis and Matsumoto's (2005) evidence suggests that managers strategically emphasize the earnings metric that "spins" the more favorable story.

For example, Bowen, Davis and Matsumoto (2005) provide evidence that managers strategically emphasize pro forma earnings metrics in earnings press releases, while Doyle, Lundholm and Soliman (2003) argue that investors are misled because they fail to understand that certain expenses excluded from analysts' "street earnings" are actually associated with lower levels of future firm performance.[3] Collectively, this body of evidence suggests that (1) investors pay attention to pro forma earnings information, (2) more- and less-sophisticated investors likely process this information differently, and (3) some adjusted-GAAP disclosures may be misleading to investors. Consequently, this study investigates *who* trades on pro forma earnings information—sophisticated investors (e.g., institutions), less-sophisticated individual investors, or both. Since individual investors with a limited ability to access and process information are most at risk of being misled, our investigation is timely and relevant given the recent concern of legislators and regulators that pro forma information may mislead investors.

We use detailed transactions data from the Trades and Quotes (TAQ) database to examine investor trading responses around 5,736 quarterly earnings press releases containing voluntarily disclosed pro forma earnings numbers issued between January 1998 and December 2003. Following prior research (e.g., Cready, 1988; Lee, 1992; Lee and Radhakrishna, 2000; Bhattacharya, 2001; Bushee, Matsumoto, Miller, 2003), we use trade size to distinguish larger, sophisticated, and well-informed investors from smaller, less-sophisticated, and less-informed investors. We rely on the Lee-Ready algorithm to infer trade direction (buy versus sell) from intraday transactions data to allow us to examine net buying (i.e., buy minus sell) activities of more- versus less-sophisticated investors around earnings press releases containing pro forma earnings information (e.g., Lee and Ready, 1991).

The results suggest that the market reaction to pro forma earnings information is almost exclusively attributable to less-sophisticated investors. The results indicate that less-sophisticated investors' abnormal net-buying activities are significantly positively associated with the magnitude and direction of the forecast error based on pro forma earnings (i.e., managers' pro forma income number minus the market's earnings

[3] While this study focuses on manager-adjusted earnings numbers, prior research investigates adjusted-GAAP earnings numbers disclosed by managers as well as analysts. Gu and Chen (2004) introduce a useful convention by labeling manager-adjusted earnings figures voluntarily reported in earnings press releases as "pro forma" earnings, and analyst-adjusted earnings numbers reported by forecast tracking services as "street" earnings. Following Gu and Chen, we report management-reported numbers as "pro forma," or "adjusted-GAAP" earnings and the numbers published by forecast data providers as "street" earnings.

expectation). In other words, we find that the higher (lower) the pro forma forecast error, the higher (lower) the less-sophisticated investors' abnormal net-buying activities, suggesting that these investors buy and sell shares based on information in pro forma earnings. In addition, less-sophisticated investors' abnormal net-buying activities are more highly associated with the pro forma forecast error than with the GAAP operating earnings forecast error (i.e., the GAAP operating EPS figure minus the market's earnings expectation). We also find that less-sophisticated investors' trading activities are significantly positively associated with the I/B/E/S forecast error (i.e., the actual EPS "street earnings" figure published by I/B/E/S minus the market's earnings expectation). However, the pro forma forecast error appears to be incrementally informative (after controlling for both GAAP operating earnings and I/B/E/S actual earnings forecast errors) in explaining the trading activities of less-sophisticated investors.[4] In sharp contrast, more-sophisticated investors' abnormal net-buying activities are not associated with forecast errors based on pro forma or GAAP operating earnings. We, however, find some evidence that more-sophisticated investors' abnormal trading activities are significantly positively associated with the I/B/E/S forecast error. Taken together, these results suggest that the segment of the market that relies on pro forma earnings information is likely to be disproportionately populated by less-sophisticated investors.

A potential caveat in interpreting results reported in this literature arises from the classic errors-in-variables problem (e.g., Bradshaw, 2003; BBCL, 2003; Berger, 2005). This problem arises because forecast tracking services, such as I/B/E/S, attempt to exclude the same items from their "street" earnings number that analysts exclude from their forecasts. Thus, the "street" forecast error generally has less measurement error than forecast errors computed by subtracting the mean analysts' forecast from GAAP operating earnings or manager-adjusted pro forma earnings. In order to ensure that our results are not attributable to measurement error, we follow Gu and Chen (2004) in disaggregating the earnings number into components and investigating managers' incremental adjustments beyond those made by analysts. This disaggregation allows us to operationalize an alternative specification that circumvents the errors-in-variables problem.[5] Consistent with our main results, we find that after controlling for the I/B/E/S forecast error (the most

[4] Likewise, the I/B/E/S forecast error is significantly incrementally informative (after controlling for both the GAAP operating earnings and pro forma forecast errors) in explaining less-sophisticated investors' trading activities.
[5] Marques (2006) uses a similar decomposition of earnings components. We discuss the Gu and Chen (2004) framework and this alternative specification in our sensitivity analyses.

accurate proxy for the earnings surprise), less-sophisticated investors' (but not more-sophisticated investors') abnormal net-buying activities are positively associated with managers' *incremental* earnings adjustments.

Our evidence that less-informed, less-sophisticated investors trade on pro forma earnings information while more-sophisticated investors do not has important implications for regulators—whose objectives include the protection of ordinary investors from potentially inaccurate and misleading information and the leveling of the informational playing field.[6] Specifically, Section 401(b) of the Sarbanes-Oxley Act of 2002 (hereafter, SOX) directs the SEC to issue regulations to ensure that pro forma financials are not misleading to ordinary investors. The SEC subsequently issued Regulation G in January of 2003 to implement the provisions of the Act. Our evidence highlights the importance of continued monitoring of the effectiveness of Regulation G and assessing the need for additional or alternative regulatory actions.

The rest of the paper is organized as follows. Section 2 discusses the background and the research questions. Section 3 describes the data and the sample selection criteria. Section 4 explains the research design and the empirical proxies. Section 5 discusses the results, and finally Section 6 provides concluding remarks.

II. BACKGROUND AND RESEARCH QUESTIONS

The rapid proliferation of pro forma financial disclosures in recent years has fueled an intense debate among supporters and critics of pro forma reporting. On the one hand, managers who report pro forma earnings numbers claim that pro forma earnings represent an improved metric for assessing future cash flows and firm value since pro forma earnings numbers exclude transitory and non-cash items from GAAP earnings (e.g., Bray, 2001 and Weil, 2001). Some practitioners concur with managers' claim that removing non-cash and non-recurring items enhances comparability in time-series measures because the GAAP measure includes items such as restructuring charges and gains and losses on the sale of assets,

[6] One of the SEC's primary missions is to mandate disclosures that reduce the extent to which some investors are at an informational disadvantage relative to others (Foster, 1986, 40; Hand and Beatty, 1992). The AICPA study group (AICPA, 1973, 17) on the *Objective of Financial Statements* notes, "An objective of financial statements is to serve primarily those users who have limited authority, ability or resources to obtain information."

which have little implication for future earnings (Halsey and Soybel, 2002). Some equity analysts also echo this sentiment as one analyst comments that the reported GAAP figure is usually an 'accounting fiction' because it frequently includes non-recurring items and other accrual accounting distortions (MacDonald, 1999). BBCL (2003) document instances where managers exclude one-time gains which results in a pro forma number that is lower than the GAAP number. These scenarios represent a conservative estimate of future profitability. Such examples suggest that some pro forma reports are altruistically motivated to disclose a clearer picture of core earnings. Richard Bernstein, chief U.S. strategist for Merrill Lynch & Co. summarizes the popularity of pro forma reporting as follows, "But for all the now-obvious shortcomings, pro forma reporting remains big in the tech world" (Sender, 2002).

Legislators, regulators, and the financial press, on the other hand, have alleged that managers opportunistically and selectively exclude income statement items from audited GAAP earnings in order to portray the company in the most favorable light possible (Derby, 2001; Dreman, 2001; Elstein, 2001; Liesman and Weil, 2001a, 2001b). Critics of pro forma reporting are skeptical of managers' claims that their adjusted earnings metrics provide a clearer picture of sustainable "core earnings". Former SEC Chairman Harvey Pitt commented, "Without appropriate disclosure, no investor—certainly not any ordinary investor—can read these (pro forma financials) in a way that's useful. An investor can't know what's been left out, why it's left out, or how it compares with other companies' earnings" (Levinsohn 2002). The Financial Accounting Standards Board (FASB) has also expressed concern that the proliferation of pro forma earnings is undermining the quality of financial reporting (FASB, 2002). In his 2002 letter to Berkshire Hathaway shareholders, Warren Buffett warned, "companies issuing such (pro forma) numbers want you to unthinkingly accept concepts that are dangerously flawed" (Byrnes and Derhovanesian, 2002). Lawrence Summers of the U.S. Treasury advises investors not to pay attention to pro forma figures but to rely on audited GAAP earnings instead (Wessel, 2002). Some academics also share this concern. D'Avolio, Gildor and Shleifer (2002) argue that even though GAAP numbers may not always provide economically superior information, failure to follow these standards is likely to lead to inefficient overall outcomes as the ability of regulators to enforce disclosure standards deteriorates.

Despite the skepticism expressed by standard setters, regulators and legislators, recent research finds evidence that investors pay attention to various adjusted-GAAP earnings figures. Bradshaw and

Sloan (2002) and Brown and Sivakumar (2003) report that investors attach more weight to street earnings figures published by a major analyst forecast tracking service (I/B/E/S) than to GAAP earnings numbers. Lougee and Marquardt (2004) provide evidence that manager-reported pro forma income has incremental information content over GAAP earnings. BBCL (2003) report that investors not only pay attention to manager-adjusted pro forma earnings, but they focus on pro forma earnings significantly more than GAAP operating earnings (before special items). These results suggest that at least some investors rely on adjusted-GAAP earnings numbers published by managers.

Two recent experimental studies find evidence that less-sophisticated investors may interpret pro forma earnings information differently from sophisticated, professional investors. Frederickson and Miller (2004) find that less-sophisticated investors (MBA students) predict higher future stock prices than more-sophisticated investors (security analysts) when they see a press release containing a pro forma earnings number that exceeds the GAAP earnings figure. Elliott (2006) reports that when the pro forma earnings number is emphasized in the press release relative to the GAAP earnings number, less-sophisticated investors (MBA students) increase their expectations about future earnings, while more-sophisticated investors' (analysts) judgments are unaffected by this manipulation. Collectively, these results suggest that (1) investors pay attention to pro forma numbers, and (2) less-sophisticated, less-informed individual investors are likely to process pro forma earnings information differently from better-informed professional investors.

Several recent studies suggest that pro forma earnings information may be misleading to investors. Doyle, Lundholm and Soliman (2003) find that expenses excluded from analysts' "street earnings" have implications for future cash flows. They also find that investors fail to fully understand the implications of these exclusions for future firm performance, and a trading strategy based on the excluded expenses generates significant abnormal returns in the future periods even after controlling for known risk proxies. Lougee and Marquardt (2004) also provide preliminary evidence that investors misprice management-issued pro forma numbers. While Johnson and Swartz (2005) find some evidence that "pro forma" firms are systematically priced higher than "non-pro-forma" firms, they fail to find consistent evidence indicating that investors are misled by pro forma earnings information. Finally, Bowen, Davis, and Matsumoto's (2005) results suggest that managers' placement of pro forma versus GAAP earnings

metrics in earnings press releases is opportunistically motivated and focuses on the metric that "spins" the more favorable story.

Given preliminary evidence that pro forma earnings may be misleading, the investors who are clearly most at risk of being misled are the less-wealthy, individual class of investors because extant research indicates that these investors lack the necessary sophistication and experience to fully understand the precision and reliability of their information set.[7] Regulators and legislators are particularly concerned that pro forma disclosures may be misleading to ordinary investors. The U.S. Congress has expressed serious concern that inaccurate or misleading corporate disclosures may hurt the less-sophisticated investors (Burns, 2001). Therefore, a thorough investigation of *who* trades on pro forma earnings information is particularly timely and relevant. Consequently, this study examines investor trading responses around pro forma earnings announcement dates. Specifically, the study investigates the following research questions:

(1) Who trades on pro forma earnings information: less-sophisticated investors, more-sophisticated investors, or both?

(2) To what extent do more-and less-sophisticated investors trade incrementally on the earnings surprise based on pro forma earnings vis-à-vis the surprise based on GAAP operating earnings or the earnings figure published by I/B/E/S?

III. SAMPLE SELECTION AND DATA

We searched the *PR Newswire* and *Business Wire* on LexisNexis for the years 1998-2003 to collect a comprehensive sample of pro forma press releases. A typical pro forma press release contains the GAAP earnings per share (EPS) figure, a pro forma earnings number (an adjusted-GAAP earnings measure voluntarily disclosed by managers) for the current quarter, and various other details management

[7] In an experimental setting, Bloomfield et al. (1999) find that less-sophisticated investors do not fully understand the limitations of their information set, and trade aggressively to systematically transfer wealth to sophisticated investors. Barber and Odean (1999, 2000) conclude after analyzing proprietary brokerage data that individual investors make suboptimal trading decisions and earn returns far below the market average due to their inability to assess the limitations of their information sets. Hirshleifer and Hong (2003) develop a stylized analytical framework to model sophisticated and naïve investors' interactions in the context of pro forma disclosure and show that naïve investors do not appropriately discount non-standard pro forma information and consequently overvalue the firm, while sophisticated investors do not. Stock price, as a weighted average of beliefs, appears high to sophisticated investors prompting them to sell and appears low to naïve investors prompting them to buy. Consequently, a wealth transfer takes place between the two groups.

deems to be relevant. We include earnings announcements in which the company discloses a pro forma number that differs from the "bottom line" GAAP diluted EPS number disclosed in the same press release. Our original search uses the keywords "pro forma," "pro-forma," and "proforma" and retrieves 50,011 press releases. However, companies often use other nomenclatures to describe their adjusted-GAAP earnings figures. Wallace (2002) performs a detailed categorization of adjusted-GAAP earnings nomenclatures used by companies. Based on Wallace's (2002) list of adjusted-GAAP earnings nomenclatures, we further search LexisNexis using the following expanded search string: "earnings excluding," "net income excluding," "adjusted net income," "adjusted loss," "cash earnings," "earnings before," "free cash flow," "normalized EPS," "normalized earnings," "recurring earnings," "distributable cash flow," "GAAP one-time adjusted," "GAAP adjusted," "cash loss," AND NOT "pro forma," "pro-forma," or "proforma."[8] This expanded search yields an additional 33,373 hits bringing the grand total to 83,384 potential press releases. After carefully reading each press release, we find that 17,511 announcements contain actual quarterly pro forma earnings announcements. The other 65,873 press releases from the initial searches refer to such things as current period pro forma revenues, forward-looking pro forma forecasts, earnings after adding in results from firms acquired or merged in the current period, or statements referring to prior period pro forma earnings.

We require firm-quarter observations to have data available in the Compustat, CRSP, I/B/E/S, and TAQ databases in order to perform our empirical analyses. These requirements result in a final sample of 5,736 announcements of 2,209 unique firms from January 1998 to December 2003. We collect actual pro forma announcement time stamps from Bloomberg. If a company announces pro forma earnings during non-trading hours (i.e., between 4:30 PM and 9:30 AM), we set the time of the announcement to 9:30 AM the next trading day. We obtain detailed intraday transactions data from the TAQ database. TAQ reports all trades and quotes originating from the NYSE, AMEX, Nasdaq, or the regional exchanges. For each trade, TAQ provides the time of the transaction to the nearest second, price, volume, and a trade condition code. Except for the opening trade of each day, we include all trades with a condition code of "regular

[8] Note that we do not include EBIT or EBITDA since they are commonly reported as standard steps in the income statement. Moreover, these figures were often reported on a per share basis long before the pro forma reporting trend began in the late-1990s.

sale" occurring between 9:30 AM and 4:30 PM Eastern Standard Time (EST) in our tests.[9] We exclude the opening trade because it is often the sum of multiple orders and including it could add noise to our measures (Lee and Ready, 1991; Lee, 1992). However, our results are almost identical (not tabulated) when we include the opening trade in our analyses. We only include trades with a "regular sales" condition code because these trades result from continuous two-sided auctions involving market orders, limit orders, and buys and sells against the specialists' inventories. This is not the case when the condition code indicates something other than a "regular sale" (e.g., large block trades or stopped orders).

IV. RESEARCH DESIGN AND EMPIRICAL PROXIES

Observation Intervals

We examine three trading days surrounding the pro forma announcement date: day -1, day 0, and day +1.[10] In our analysis a "trading day" is comprised of seven consecutive trading hours (since a normal trading day from 9:30 AM to 4:30 PM is seven hours long). Day 0, the day of the earnings announcement containing a pro forma earnings figure, begins at the time of the press release and continues for the next seven hours during which equity markets are open. Since our trading days are defined with respect to the timing of the earnings press release, they generally do not correspond to a typical day of trade beginning at 9:30 AM and ending at 4:30 PM EST, but instead span seven hours of trading during two different calendar days.

Proxy for Investor Sophistication and Wealth

Prior research suggests that, on average, wealthier, more-sophisticated, professional investors (like institutions) are likely to make larger trades, while less-wealthy and less-sophisticated investors (primarily individuals) are likely to make smaller trades (e.g., Easley and O'Hara, 1987; Hasbrouck, 1988, 1991; Chan and Lakonishok, 1993; Lee and Radhakrishna, 2000). Therefore, several prior studies (e.g., Cready, 1988; Cready and Mynatt, 1991; Lee, 1992; and Bhattacharya 2001), use trade size to differentiate wealthy, sophisticated investors from less-wealthy, less-sophisticated investors. Existing

[9] Although NYSE and AMEX close at 4:00 PM EST, we allow an extra thirty minutes to pick up trades originating on the regional exchanges or trades reported late (e.g., Lee and Ready, 1991; Lee, 1992; Bhattacharya, 2001).
[10] We extend our examination up to five trading days before the earnings announcement date (i.e., one full week of trading prior to the earnings announcement). However, we detect no significant abnormal trading activities by more- or less-sophisticated investors before day -1.

research also suggests that sophisticated, informed investors may not always submit large orders. Kyle's (1985) model shows that rational, informed investors often have an incentive to engage in medium-sized trades to disguise their private information. Empirical research also provides support for this conjecture (e.g., Cornell and Sirri, 1992; Meulbroek, 1992; Barclay and Warner, 1993). Sophisticated institutional investors, however, are unlikely to engage in very small trades as it may significantly reduce their trading profits for the following reasons. First, breaking a large order into numerous small orders significantly increases direct transaction costs. Second, a series of small orders from one account could prompt the specialist to increase the spread. Finally, breaking a large order into smaller parts would require more time to move all of the desired shares, thereby increasing the chance that other arbitrageurs would enter the market, further eroding trading profits. Consequently, small trades are likely to capture primarily individual trading activity, while medium and/or large trades are likely to capture primarily sophisticated institutional trading activity. Chakravarty's (2001) evidence from detailed audit trail data supports this conjecture. He finds that significant institutional trading activity takes place in medium-sized trades, while vast majority of individual trading activity takes place in really small trade sizes below 500 shares. Barclay, Hendershott and McCormick (2003) provide recent empirical evidence confirming Chakravarty's conclusions. Consequently, we investigate small trades to capture the activities of relatively less-informed and less-sophisticated individual investors and we examine medium and large trades to capture the activities of sophisticated, primarily institutional investors.

Our main analyses classify trades of $7,000 or less as small trades, trades between $7,000 and $50,000 as medium-sized trades, and trades over $50,000 as large trades. We also repeat all analyses (not tabulated) using several alternative cutoff schemes to ensure that our results are not sensitive to specific cutoff points. We use transactions of $5,000 or less, and less than $10,000 as alternative cutoff schemes for classifying small trades. We classify transactions between $10,000 and $50,000, and transactions between $10,000 and $100,000 as alternative cutoff points for medium trades. We use trades sizes of greater than or equal to $40,000 and greater than or equal to $100,000 to identify large trades. Finally, in order to examine extremely large orders that could only be submitted by institutions or extremely wealthy

individuals, we examine a third alternative cutoff of $250,000 or more for classifying large trades. All our results are qualitatively similar when we use these various alternative cutoff schemes.

Figure 1 provides the distributions of the average dollar-value of shares traded[11] during each day in the announcement window. The purpose of this figure is to provide a snapshot of the activities of small, medium and large investors during the announcement period. For example, we find that transactions of $10,000 or below (encompassing our various small-investor cutoffs) comprise approximately 29% of total dollar-volume on day 0, the earnings announcement day (second chart of Figure 1). Transactions between $10,000 and $50,000 (generally capturing medium-investor activities) also comprise approximately 29% of the total dollar-volume on the day of the announcement. Finally, transactions of $50,000 or above (our large investor cutoff) comprise about 42% of raw dollar-volume on the announcement day. We observe similar distributional characteristics on the day before (day -1) and the day after (day +1) the earnings announcement. Since our large-investor (medium-investor) cutoff captures approximately 46% (24%) of the daily announcement period *raw* dollar-volume during the three-day announcement window, we conclude that our sample does not consist primarily of smaller, thinly traded firms in whose stocks large investors seldom trade.

[Insert Figure 1 about here]

Method and Variable Definitions

As previously mentioned, we hand-collect adjusted-GAAP diluted earnings per share numbers disclosed by managers in their earnings press releases and label them as $EPS_{PROFORMA}$. We benchmark investor reactions to $EPS_{PROFORMA}$ with diluted earnings per share from operations ($EPS_{GAAP\text{-}OP}$) from Compustat.[12] This diluted operating EPS figure from Compustat excludes all "special items" and "below-the-line" items. Several recent studies document that investors pay significant attention to actual EPS figures provided by analyst forecast tracking services, such as I/B/E/S (e.g., Bradshaw and Sloan, 2002; Brown and Sivakumar, 2003; Doyle, Lundholm and Soliman, 2003). Consequently, we examine a third earnings metric

[11] Note that this figure illustrates *raw* dollar-volume, not *abnormal* dollar-volume.

[12] We begin with Compustat's basic earnings per share from operations (quarterly data item 177) and multiply this by the number of basic shares outstanding (Compustat quarterly data item 15) to get total operating earnings. We then divide operating earnings by the number of diluted shares outstanding (Compustat annual data item 171) to obtain quarterly diluted earnings per share from operations. Subsequent to our data collection for this project, we learned that Compustat's latest files contain a quarterly diluted operating EPS number (data item 181).

– the actual EPS figure from I/B/E/S ($EPS_{I/B/E/S}$).[13] Thus, our trading analysis complements the BBCL (2003) study which investigates price reactions to all three earnings metrics – pro forma EPS, GAAP operating EPS, and I/B/E/S actual EPS.

In order to ascertain the announcement-period investor reaction to new information contained in each of the three earnings metrics, we calculate the earnings surprise or forecast error for each metric using two different earnings expectations. The first expectation is the mean analysts' earnings forecast. This measure is timely (current) and comprehensive and has been used widely in empirical research as a proxy for the unobservable market expectation. However, this measure may produce bias against the forecast error based on GAAP operating earnings when it is compared with forecast errors based on I/B/E/S and pro forma earnings figures. This bias stems from the fact that I/B/E/S generally excludes the same items from its actual EPS figures that the majority of analysts exclude from their forecasts. Further, there is overlap between exclusions made by managers and exclusions made by analysts (e.g., BBCL, 2003; Doyle, Lundholm and Soliman, 2003). In order to address this concern, we employ a second earnings expectation— GAAP operating earnings from the same quarter of the previous year (i.e., the seasonal random-walk earnings expectation). Although the seasonal random-walk earnings expectation may alleviate the bias against the GAAP operating earnings forecast error, it is a much noisier expectation than the analysts' consensus forecast.[14] Thus, we compute three forecast errors ($FE_{PROFORMA}$, $FE_{GAAP\text{-}OP}$ and $FE_{I/B/E/S}$) by subtracting the earnings expectation (measured either by the analysts' mean forecast or by the seasonal random-walk forecast) from the three actual earnings metrics, and scaling this difference by the closing price five days before the earnings announcement date, day t-5 (e.g., Christie, 1987).[15]

[13] We collect I/B/E/S actual EPS figures from the *unadjusted* I/B/E/S Actuals file. We use the unadjusted I/B/E/S Actual and Detail files to avoid biases arising from using *adjusted* I/B/E/S data (e.g., Payne and Thomas, 2003).

[14] Analysts' forecasts are more comprehensive and precise than random-walk forecasts because security analysts have incentives to quickly impound value-relevant predisclosure information in their earnings forecasts (e.g., Mikhail, Walther and Willis, 1999). Brown, Griffin, Hagerman and Zmijewski (1987) argue that analysts forecasts are more accurate and less noisy than random-walk forecasts because analysts' forecasts have a contemporaneous advantage (i.e., incorporate a variety of other information than just the past earnings stream) as well as a timing advantage (i.e., they take into account more recent information).

[15] The mean forecast is calculated for each firm using all forecasts from the *unadjusted* I/B/E/S Detail file made within 90 days prior to the quarterly earnings announcement date. The 90-day restriction ensures that forecasts are current. We also repeat all analyses using the median forecast with no change in results. Further, we repeat our analyses using forecasts made within 45 or 60 days prior to the earnings announcement date. Shorter pre-announcement windows of 60 or 45 days ensure that forecasts are more current, but we lose observations as we reduce the length of the window (especially when we go to the 45-day window). The main tenor of the results, however, is unchanged when we use the shorter pre-announcement windows.

In order to examine the reaction of sophisticated versus less-sophisticated investors to various earnings surprise metrics, we compute abnormal net order imbalance measures for the small-, medium-, and large-investor groups. We calculate small investors' abnormal net-buy volume (buy volume minus sell volume) for firm i on each day during the announcement period (day –1, day 0, or day +1) as the small investors' day t net-buy volume for firm i *minus* small investors' average daily non-announcement period net-buy volume for firm i, scaled by the average daily non-announcement period total trading volume for firm i. We call this measure as SML_NETBUY. Again, all trades of $7,000 or less are classified as small trades. The non-announcement period is a two-week period ending exactly one month before the earnings announcement date. Thus, SML_NETBUY is an abnormal measure of net-buying activity of small investors around earnings announcement dates. A positive value for this measure indicates above-normal buying activity by small investors during the event period. For example, when SML_NETBUY is regressed on $FE_{PROFORMA}$, a significantly positive coefficient on $FE_{PROFORMA}$ would indicate that when the pro forma forecast error is positive (i.e., good news based on pro forma earnings), small investors' net-buying activity increases, and when the pro forma forecast error is negative (i.e., bad news based on pro forma earnings), small investors' net-buying activity decreases. In other words, a positive and significant coefficient on $FE_{PROFORMA}$ would suggest that small investors trade in the direction of the pro forma earnings surprise. We compute MED_NETBUY exactly the same way but based on medium-sized trades between $7,000 and $50,000. Likewise, we compute LRG_NETBUY based on trades above $50,000. Our main analyses regress small, medium, and large abnormal net-buy volume measures separately on $FE_{GAAP\text{-}OP}$, $FE_{PROFORMA}$, and $FE_{I/B/E/S}$.[16]

We rely on the algorithm developed by Lee and Ready (1991) to classify transactions as buys or sells. This algorithm uses a "tick" test to infer trade direction from intraday trades and quotes data obtained from the TAQ database and has been used widely in the empirical market microstructure

[16] We also repeat our analyses using *unsigned* abnormal trading volume instead of *signed* net-buy volume. These analyses are less reliable because the use of *unsigned* trading volume metrics requires that we take the absolute value of the forecast error variables. Thus, trading volume analysis ignores valuable information (for example, such analysis does not make any qualitative distinction between "good news" or positive forecast error and "bad news" or negative forecast error) and introduces noise in the results. Nevertheless, while the *unsigned* trading volume results are weaker, the main tenor of the results remains unchanged.

literature.[17] A more recent paper by Ellis, Michaely and O'Hara (2000) suggests some modifications of the original Lee-Ready algorithm to improve its specification. We repeat our analyses (not tabulated) using the Ellis et al. (2000) procedure to classify trades as buys and sells, but find no qualitative difference in results.

Prior research suggests that small and large firms have different investor clienteles. Specifically, prior studies suggest that individual traders are likely to account for a greater proportion of the trading activity of smaller firms, while institutional traders are likely to account for a greater proportion of the trading activity of larger firms (e.g., Bhushan, 1989; El-Gazzar, 1998; Lee and Radhakrishna, 2000). Consequently, when we regress small, medium, and large investors' abnormal net-buy volume measures on forecast errors based on pro forma earnings, GAAP operating earnings, or I/B/E/S actual earnings, we control for firm size in order to ensure that the results are not merely attributable to differences in firm size. We use the log of total assets (in millions) at the end of the previous quarter as our control for firm size (SIZE).[18] Finally, our abnormal net-buy measures control for small, medium, and large investors' firm-specific average level of liquidity trading, but they do not control for investors' trading responses associated with market-wide or macroeconomic factors. Therefore, we follow prior research (e.g., Bamber et al., 1997) by including a control for the influence of macroeconomic factors on investor net-buy responses in our regression models, the percentage of all NYSE/AMEX/NASDAQ firms' outstanding shares traded, MKTVOL, on each day in the announcement window.

V. RESULTS

Sample Characteristics

Evolution and Trends in Pro forma Reporting

Figure 2 illustrates trends in pro forma reporting practice during our sample period. The first chart indicates that pro forma reporting, in general, increased over time from 1998 until the middle of 2001 and

[17] The Lee-Ready algorithm ignores the current quote if it is less than 5 seconds old and compares the current trade price with the bid and ask of the previous quote (which is then assumed to be the current quote) to infer trade direction. Studies since then have used a 5-second lag, a 2-second lag, or no lag to define the current quote. Our main analyses employ the 5-second lag to define the current quote as in Lee and Ready (1991), but we repeated all our analyses using the 2-second lag, or no lag with no qualitative change in the results.

[18] We repeat our analyses using market value of common equity five days prior to the earnings announcement date and net sales from the previous quarter as alternative measures of firm size. The results are qualitatively similar.

has declined since that time. It is interesting to note that pro forma reporting peaked just prior to the major accounting scandals of 2001 and dropped dramatically in the third quarter of 2002—soon after the passage of the Sarbanes-Oxley Act (SOX), which requires explicit reconciliation between pro forma and GAAP earnings. The second chart presents trends for adjusted-GAAP earnings numbers for which managers use the "pro forma" label, while the third chart shows trends when managers use various other nomenclatures described in the Wallace (2002) monograph. For ease of exposition, we group these labels under the "other" nomenclature classification. While the use of the "pro forma" nomenclature dropped sharply after the passage of SOX, it appears to have recovered somewhat during 2003. Interestingly, the use of other nomenclatures dropped as well, but has not recovered to the extent that the pro forma nomenclature has recovered by the end of 2003.

[Insert Figure 2 about here]

We next investigate the types of firms that report adjusted-GAAP figures more frequently than others. Figure 3 illustrates the frequency of adjusted-GAAP reporting by nomenclature across industry classifications compared to the frequency distributions of the Compustat and I/B/E/S populations. The results suggest that companies that voluntarily disclose pro forma earnings are clustered in a few industries (i.e., they are not simply a random draw from the entire population of publicly traded firms). Figure 3 indicates that firms issuing alternative profitability measures using the "pro forma" nomenclature are heavily concentrated in certain manufacturing (SIC codes 3000-3999) and business service industries (SIC codes 7000-7999), while those using other nomenclatures are highly concentrated in financial service industries (SIC codes 6000-6999). Figure 3 depicts that these industry concentrations vary significantly from both the Compustat and I/B/E/S populations, whose distributions are similar to one another.

[Insert Figure 3 about here]

We next examine the frequency with which individual companies report adjusted-GAAP earnings figures during our six-year sample period and report the results in Figure 4. The figure reveals that firms announce adjusted-GAAP earnings numbers both infrequently and sporadically. Consistent with BBCL (2003), Figure 4 indicates that 84% of our sample firms [(1,105 + 479 + 262) ÷ 2,209] report a pro forma (adjusted-GAAP) earnings number three times or less during our entire 24-quarter sample period. This suggests a second level of self-selection. Not only is it a small subset of firms concentrated in particular

industries that voluntarily reports adjusted-GAAP earnings, but these firms choose when to report these alternative profitability figures. Overall, our descriptive evidence suggests that research that employs I/B/E/S actual earnings figures (e.g., Bradshaw and Sloan, 2002), or standard Compustat data items (e.g., Brown and Sivakumar, 2003)—based on all or part of the I/B/E/S-Compustat population—as a proxy for manager-disclosed pro forma earnings, may not adequately capture the characteristics of the relatively small subset of firms whose managers voluntarily elect to report these numbers in select quarterly earnings press releases.[19,20]

[Insert Figure 4 about here]

Descriptive Statistics

Table 1 provides descriptive statistics. Specifically, Panel A presents information about various firm characteristics, while Panel B provides descriptive statistics regarding the nature of announcement period market reactions. The median total assets of our sample firms is $621 million, while the mean is $6.2 billion—which is higher than the 75th percentile ($2.5 billion). This suggests that while some extremely large firms voluntarily disclose adjusted-GAAP earnings numbers in their quarterly press releases, most pro forma firms are relatively small. The stock price distribution is also slightly positively skewed with a mean of $25.09 and a median of $17.56 per share. Panel A also presents descriptive statistics for the three earnings metrics. As mentioned earlier, our measure of GAAP diluted operating earnings per share, $EPS_{GAAP\text{-}OP}$, excludes both below-the-line items and special items. The mean of $EPS_{GAAP\text{-}OP}$ is $0.06, suggesting that the average operating earnings for our sample firms is positive.[21] The mean I/B/E/S actual earnings per share, $EPS_{I/B/E/S}$, is $0.13. The fact that $EPS_{I/B/E/S}$ is higher than $EPS_{GAAP\text{-}OP}$ suggests that analysts may exclude some recurring expenses, since the vast majority of one-time items (below-the-line and special items) are already excluded from our measure of GAAP operating earnings. Finally, the mean $EPS_{PROFORMA}$ is $0.22 suggesting

[19] While Bradshaw and Sloan (2002) use essentially the entire I/B/E/S-Compustat population, Brown and Sivakumar (2003) screen out observations where the I/B/E/S actual EPS number is equal to a Compustat operating EPS number.
[20] It is likely that our comprehensive search string does not capture all voluntarily disclosed adjusted-GAAP earnings figures. However, given Wallace's (2002) detailed categorization of common adjusted-GAAP nomenclatures, it is likely that our expanded search string identifies the majority of these reports. We still find that only 11% of the Compustat-I/B/E/S population reports these figures at the peak of adjusted-GAAP reporting. Therefore, we feel that the use of commercial database populations to proxy for management-issued adjusted-GAAP figures can largely obscure the unique characteristics of this select group of firms that voluntarily discloses pro forma earnings figures.
[21] Our sample firms' average bottom-line GAAP EPS is $-0.04. Thus, firms that voluntary announce pro forma (adjusted-GAAP) earnings are, on average, unprofitable.

that managers often exclude more non-recurring expenses than do analysts.[22] Panel A also includes descriptive statistics for the three forecast error variables used in our analyses.[23] The mean $FE_{GAAP\text{-}OP}$, \$-0.01, suggests that, on average, the GAAP operating income figure (which generally excludes all transitory items) falls just short of meeting analysts' forecasts. Consistent with the notion that analysts sometimes exclude recurring expenses (i.e., more than just below-the-line and special items) from their forecasts, the mean $FE_{I/B/E/S}$ is positive, \$0.03. Finally, the results suggest that managers are more aggressive in excluding expenses than analysts since the mean $FE_{PROFORMA}$, \$0.11, is even more positive and significantly greater than the mean forecast errors based on both GAAP operating EPS and I/B/E/S actual EPS. Interestingly, the Pearson correlations among the three forecast error measures are all significant, although none of the pair-wise correlations exceeds 30%.[24] This suggests that earnings surprise measures based on GAAP operating earnings, manager-disclosed pro forma earnings, and I/B/E/S actual EPS capture unique, non-overlapping information sets.

[Insert Table 1 about here]

Panel B presents descriptive statistics for our abnormal net-buy measures. These variables represent the abnormal net-buy volume (buy volume less sell volume) for different trade-size groups. We observe above-normal net-buying activity by small and medium investors, while somewhat below-normal net-buying activity by large investors during the announcement period. We also find that small and medium abnormal net-buy measures are right-skewed as the means are greater than the medians, while the large abnormal net-buy measure is left-skewed.

[22] We compare all three earnings metrics using both parametric *t*-tests and non-parametric Wilcoxon Rank-Sum tests. We find that central tendencies (mean and median) of $EPS_{GAAP\text{-}OP}$, $EPS_{I/B/E/S}$, and $EPS_{PROFORMA}$ are highly statistically different from each other. This illustrates that although the three earnings metrics have some commonality in terms of exclusions, there are also significant differences among them. This further bolsters our motivation for using all three earnings metrics in our examination of sophisticated versus less-sophisticated investor reactions around pro forma announcement dates because each earnings metric may have a significant incremental contribution over the other two.

[23] In the spirit of conciseness, we only tabulate results based on forecast error variables that use the mean analyst forecast as the earnings expectation. Results based on the seasonal random-walk earnings expectation are slightly weaker since the seasonal random-walk is a much more noisy expectation than analysts' consensus forecast. However, the results are qualitatively similar and the study's main inferences remain unchanged.

[24] We obtain the following Pearson correlation coefficients among the three forecast error measures: $\rho(FE_{GAAP\text{-}OP}, FE_{I/B/E/S}) = 0.30$, $\rho(FE_{GAAP\text{-}OP}, FE_{PROFORMA}) = 0.29$, $\rho(FE_{PROFORMA}, FE_{I/B/E/S}) = 0.26$.

Who Trades on Pro Forma Information?

Our first research question investigates *who* trades on pro forma information—sophisticated investors (e.g., institutions), less-sophisticated individual investors, or both. Our second research question examines the extent to which the net-buying activities of more-and less-sophisticated investors are associated with the pro forma forecast error vis-à-vis forecast errors based on GAAP operating EPS and I/B/E/S actual EPS. As previously mentioned, we investigate three trade size categories – small, medium and large. We expect that the small trade category will primarily capture the activities of less-sophisticated and less-informed individual investors, while the medium and large trade categories will primarily capture sophisticated institutional trading. We first examine less-sophisticated investors' trading activities around pro forma earnings announcement dates by estimating the following four regression models:

$$SML\_NETBUY_{i,t} = \alpha_0 + \alpha_1 FE_{GAAP\text{-}OPi} + \alpha_4 SIZE_i + \alpha_5 MKTVOL_t + \varepsilon \quad (1),$$

$$SML\_NETBUY_{i,t} = \alpha_0 + \alpha_2 FE_{PROFORMAi} + \alpha_4 SIZE_i + \alpha_5 MKTVOL_t + \varepsilon \quad (2),$$

$$SML\_NETBUY_{i,t} = \alpha_0 + \alpha_3 FE_{I/B/E/Si} + \alpha_4 SIZE_i + \alpha_5 MKTVOL_t + \varepsilon \quad (3),$$

$$SML\_NETBUY_{i,t} = \alpha_0 + \alpha_1 FE_{GAAP\text{-}OPi} + \alpha_2 FE_{PROFORMAi} + \alpha_3 FE_{I/B/E/Si} + \alpha_4 SIZE_i + \alpha_5 MKTVOL_t + \varepsilon \quad (4),$$

Where:	$SML\_NETBUY_{i,t}$	=	small investors' day t *abnormal* net-buy volume,
	$FE_{GAAP\text{-}OPi}$	=	firm i's *signed* GAAP operating earnings forecast error,
	$FE_{PROFORMAi}$	=	firm i's *signed* pro forma forecast error,
	$FE_{I/B/E/Si}$	=	firm i's *signed* I/B/E/S forecast error,
	$SIZE_i$	=	the log of firm i's total assets at the end of the previous quarter, and
	$MKTVOL_t$	=	market-wide trading volume on day t.

The first three models examine the extent to which each of the three earnings surprise metrics *separately* explains less-sophisticated investors' abnormal net-buying activities during the three days in the announcement period (day -1, day 0 and day +1). A positive (negative) value for SML_NETBUY indicates above-normal (below-normal) net-buying activities by less-sophisticated investors during the event period. The forecast errors in these analyses are also directional (signed). For example, a positive $FE_{PROFORMA}$ indicates good news based on pro forma earnings (i.e., the actual pro forma figure disclosed by managers is greater than the earnings expectation). Consequently, a significantly positive coefficient on $FE_{PROFORMA}$ in Model 2, α_2, would indicate that a higher (lower) pro forma forecast error results in higher (lower) *abnormal* net-buying activities by small investors. In other words, a positive α_2 indicates that less-sophisticated investors are trading (net buying or selling) in the direction of the pro forma earnings surprise. Thus, the regression coefficients on the forecast errors in these models are interpreted in the same

way one would interpret an earnings response coefficient (ERC) in a return-earnings regression (i.e., a positive ERC indicates that price moves in the same direction as the earnings surprise). Finally, Model 4 regresses SML_NETBUY simultaneously on all three forecast errors. Thus, Model 4 estimates the incremental explanatory power of each earnings forecast error, after controlling for the other two forecast errors. Since prior research suggests that smaller and larger firms have different investor clienteles (e.g., Bhushan, 1989; El-Gazzar, 1998; Lee and Radhakrishna, 2000), we include SIZE to ensure that our results are not attributable to differences in firm size. Finally, MKTVOL controls for the influence of market-wide macroeconomic factors on investor trading responses.[25, 26]

Table 2 reports the results of estimating Models 1 through 4. Model 1 results indicate that the coefficient on the GAAP operating earnings forecast error, $FE_{GAAP\text{-}OP}$ (α_1), is never significant on any day in the event window, suggesting that less-sophisticated investors do not trade on GAAP operating earnings information. Model 2 results indicate that the coefficient on, $FE_{PROFORMA}$ (α_2), is positive and highly significant (two-tailed p-value < 0.001) on day +1 of the announcement window, suggesting that less-sophisticated investors generally trade in the same direction as the pro forma forecast error (i.e., buy on pro forma good news and sell on pro forma bad news) the day *after* the earnings announcement. The coefficient on $FE_{PROFORMA}$, α_2, is not significant on day 0, but it is marginally significant and negative on day -1. This result is consistent with the notion that some less-sophisticated investors anticipate the pro forma earnings news and trade in the direction opposite the pro forma forecast error the day before the announcement. However, since the coefficient is only marginally significant (p-value = 0.09), we are reluctant to draw conclusive inferences regarding this result. The results for Model 3 indicate that the coefficient on $FE_{I/B/E/S}$, α_3, is significantly positive on day 0 and day +1, suggesting that less-sophisticated investors trade on information in I/B/E/S actual earnings on the day of and the day after the announcement. Overall, the results for Models 1 through 3 indicate that less-sophisticated investors trade

[25] We winsorize all variables used in the regression analyses at the 1st and 99th percentiles to reduce the influence of extreme observations.

[26] To mitigate the effects of skewness in the data, we log-transform small, medium, and large abnormal net-buy measures, the forecast error variables, and the firm size measure in the regression models. To avoid taking the logarithm of negative or zero numbers, we add a positive constant whenever necessary (e.g., Ajinkya and Jain, 1989; Richardson et al., 1986). We also repeat our main analyses using rank-transformed data and obtain qualitatively similar results. Finally we find that, despite skewness in the data, our inferences are unchanged when we use completely untransformed variables in our analyses. This suggests that our inferences are quite robust and not sensitive to any particular transformation.

based on (1) information in pro forma earnings on day +1, and (2) information in I/B/E/S actual EPS figures on days 0 and +1, but do not trade on the GAAP operating earnings.[27,28]

[Insert Table 2 about here]

Model 4 includes all three forecast errors simultaneously to allow us to examine the incremental significance of each in explaining less-sophisticated investors' abnormal net-buy volume after controlling for the information in the other two earnings surprise variables. The results indicate that on day -1, the coefficient on $FE_{PROFORMA}$ (α_2) is marginally significantly negative, while the coefficients on $FE_{GAAP\text{-}OP}$ (α_1) and $FE_{I/B/E/S}$ (α_3) are insignificant. However, the *F*-tests indicate that the coefficient on $FE_{PROFORMA}$ is not significantly different from the (insignificant) coefficients on the other two forecast errors. The earnings announcement date (day 0) results displayed for Model 4 indicate that the coefficient on $FE_{GAAP\text{-}OP}$ (α_1) is insignificant and the coefficient on $FE_{PROFORMA}$ (α_2) is marginally negatively significant. Again, the *F*-test suggests that α_1 and α_2 are not significantly different from each other. The coefficient on $FE_{I/B/E/S}$ (α_3), on the other hand, is significantly positive and also significantly greater than the coefficients on $FE_{GAAP\text{-}OP}$ and $FE_{PROFORMA}$. This evidence suggests that the I/B/E/S forecast error has significant incremental explanatory power for small-investor abnormal net-buy volume over the other two forecast errors on the day of the announcement. On day +1, both the coefficients on $FE_{PROFORMA}$ (α_2) and $FE_{I/B/E/S}$ (α_3) are significantly positive, suggesting that each has significant incremental explanatory power relative to the other on the day after the announcement (*F*-statistics indicate that each coefficient is statistically significantly different from

[27] We note that the coefficient on SIZE is negative and significant on day +1 in all four models, suggesting that less-sophisticated investors are more likely to buy stocks of smaller firms. The coefficient on MKTVOL is also positive and significant on day +1 for models 1 and 3, suggesting that market-wide factors influence less-sophisticated investors' trading.

[28] Additional (untabulated) analyses suggest that the significant association between less-sophisticated investors' abnormal net-buy volume and the pro forma earnings surprise for day +1 relative to the earnings announcement holds: (a) for all sub-periods during 1998 to 2003, (b) for all nomenclatures used by managers to describe their pro forma earnings figures, and (c) whether or not the pro forma earnings figure or the GAAP number is emphasized (placed first) in the press release. Thus, our main inference that less-sophisticated investors rely on information in pro forma earnings is quite robust.

the other). The coefficient on $FE_{GAAP\text{-}OP}$ (α_1) is significantly negative and the *F*-Tests indicate that both α_2 and α_3 are significantly greater than α_1.[29,30, 31]

In summary, the results for Models 1 through 4 paint a consistent picture. We find that GAAP operating earnings is not a significant explanator of less-sophisticated investors' abnormal net-buying activity during the announcement period. On the other hand, not only is the pro forma forecast error a significant explanator of less-sophisticated investors' abnormal net-buying activities on day +1, but also it has significant incremental explanatory power relative to the forecast errors based on I/B/E/S and GAAP operating earnings on day +1. Finally, the forecast error based on I/B/E/S actual earnings is significantly incrementally associated with less-sophisticated investors' abnormal net-buy volume on days 0 and +1.[32]

Table 3 reports the results of estimating Models 1 through 4 after replacing SML_NETBUY with MED_NETBUY as the dependent variable. MED_NETBUY is designed to capture the abnormal net-buying activities of sophisticated investors. Investors who submit medium-sized orders may include wealthy individuals or institutions intending to disguise their private information by breaking large orders into smaller trades (e.g., Cornell and Sirri, 1992; Meulbroek, 1992; Barclay and Warner, 1993). The

[29] One interpretation is that the GAAP operating earnings surprise has no incremental explanatory power after controlling for pro forma and I/B/E/S earnings surprises. The fact that the coefficient on the GAAP operating earnings forecast error is negative could be a mechanical result. For example, it is possible that additional exclusions of non-recurring expenses can convert an operating earnings loss into a pro forma or I/B/E/S profit. Thus, if less-sophisticated investors generally buy based on good pro forma or I/B/E/S news (i.e. additional exclusions of non-recurring expenses that convert the GAAP operating loss to a profit), their trades will also appear to be systematically opposite in direction from the GAAP operating earnings forecast error. Therefore, it is conceivable that the negative coefficient on $FE_{GAAP\text{-}OP}$ is likely a mechanical result driven by the abnormal net-buying activities of less-sophisticated investors spurred by good news based on $FE_{PROFORMA}$ and $FE_{I/B/E/S}$ on day +1.

[30] Since prior research finds that trading volume is significantly positively associated with the absolute price change (e.g., Karpoff, 1987), we control for firm-specific abnormal returns in regression models 1 through 4 as an additional robustness check. This additional control ensures that our results are not attributable to the actions of investors who simply trade following large price changes. Consequently, we repeat our Table 2 analyses after including the daily size-adjusted abnormal return as an additional control variable. The abnormal return variable is never significant on days -1 and 0 and is always highly significantly positive on day +1, suggesting that less-sophisticated investors do react significantly to large price changes. Nevertheless, our inferences are unchanged even after including this additional control, providing evidence that our results are not attributable to less-sophisticated investors' response to large price movements.

[31] Collinearity diagnostics indicate that all condition indices are well within acceptable levels for all regression models (Belsey, Kuh, and Welsch, 1980).

[32] Interestingly, when we estimate Models 1 through 4 using the seasonal random-walk forecast as the earnings expectation, we no longer find that the earnings surprise based on I/B/E/S actual EPS is significantly correlated with SML_NETBUY separately (Model 3) or together with the other earnings surprise variables (Model 4). In sharp contrast, even when we use the random-walk earnings expectation, the pro forma forecast error is still highly significantly positively associated with SML_NETBUY separately (Model 2) as well as jointly with the other forecast errors (Model 4). Therefore, the result that less-sophisticated investors trade based on information in pro forma earnings is likely more robust than the result that these investors trade based on I/B/E/S actual earnings.

results from estimating Models 1 and 2 in Table 3 indicate that neither the operating GAAP forecast error nor the pro forma forecast error are significantly associated with MED_NETBUY on any day in our announcement window. Model 3 indicates that the I/B/E/S forecast error is significantly positively associated with MED_NETBUY on day +1. When we include all three forecast errors in Model 4, we find similar results. The forecast errors based on GAAP operating income and pro forma earnings are not significant on any day in the event window, while the I/B/E/S forecast error is highly significant and positive on day +1. The *F*-tests indicate that the coefficient on the I/B/E/S forecast error is significantly greater than the coefficients on the other two forecast errors on day +1. Thus, medium-sized trades that likely capture sophisticated investors' stealth trading activities are associated with the I/B/E/S forecast error and not with the pro forma forecast error. This implies that, unlike the case of less-sophisticated individual investors, sophisticated institutional investors base their trading decisions on information in I/B/E/S street earnings and not on information in managers' pro forma income figures.

[Insert Table 3 about here]

Finally, we estimate Models 1 through 4 using LRG_NETBUY as the dependent variable. Table 4 reports these regression results for large orders. This table shows that none of the coefficients on any of the forecast errors is significant on any of the trading days in the announcement window. This suggests that sophisticated investors do not submit large orders based on the information in any of the earnings surprise variables during the three-day earnings announcement window. Table 1 shows that the LRG_NETBUY values are either negative or very close to zero. One of the implications of the combined results from Tables 1, 3 and 4 is that sophisticated investors generally avoid information-induced trading around pro forma announcement dates (i.e., their abnormal net-buying activities are either negative or zero). However, when they do trade, they likely engage in stealth trading by breaking their large orders into medium-sized trades and generally trade on information contained in the I/B/E/S earnings surprise.

[Insert Table 4 about here]

Results from Tables 2 through 4 can be summarized as follows. First, less-sophisticated investors trade on information in pro forma earnings and on information in I/B/E/S actual earnings. Second, earnings surprise variables (forecast errors) based on both pro forma and I/B/E/S street earnings have incremental explanatory power relative to the other for explaining less-sophisticated investors' net-buying

activities. Third, less-sophisticated investors in pro forma firms do not trade on information in unexpected GAAP operating earnings. Finally, sophisticated investors either avoid trading around pro forma earnings announcements, or they trade based on information in I/B/E/S actual earnings using medium-sized trades, but do not trade at all based on manager-disclosed pro forma earnings information. Since this body of evidence suggests that less-sophisticated investors trade on pro forma earnings information, while sophisticated investors do not, *if* some pro forma disclosures are indeed misleading, less-sophisticated, individual investors are most at risk of being misled.[33]

Sensitivity Analyses

Matched-Sample Tests

In order to further investigate the seemingly "lukewarm" trading responses of sophisticated investors around earnings announcements containing management-issued adjusted-GAAP figures, we investigate a matched sample of earnings announcements of firms that do not voluntarily disclose an alternative profitability figure in their quarterly earnings press releases. We collect a match for each firm-quarter observation in our sample by selecting a non-pro-forma "matched" firm for each of our pro forma

[33] One might argue that even though less-sophisticated investors trade on pro forma information, while sophisticated investors do not, if the sophisticated professional investors almost always set the price, small investors may be "price takers" and thus be "price protected." Therefore, as an aside, we investigate the extent to which small, medium and large abnormal net-buying activities are associated with announcement-period price movements. We regress size-adjusted abnormal returns, cumulated over the three-day announcement period window (CAR), on abnormal small, medium, and large net-buy measures (SML_NETBUY, MED_NETBUY, LRG_NETBUY) also cumulated over the three-day announcement window. We find that when CAR is regressed separately on each of the abnormal net-buy variables, each is significantly positively associated with CAR suggesting that the trading activities of all three investor groups are associated with announcement period price movements. However, Vuong's (1989) likelihood ratio tests reveal that the adjusted-R^2 for the model where SML_NETBUY is the dependent variable is significantly higher than the adjusted-R^2 values for the models where MED_NETBUY or LRG_NETBUY are the dependent variable. Moreover, when we regress CAR simultaneously on all three aggregated abnormal net-buy measures, the coefficient on SML_NETBUY is significantly higher (based on *F*-tests) than the coefficients on the other two abnormal net-buy measures, although all three coefficients are statistically significant. These results suggest that small investors may have a role in setting prices (which is not surprising given our evidence that sophisticated investors do not engage in particularly heavy trading around pro forma announcements), and as a result may not always be "price protected."

firms based on firm size and industry.[34] We investigate small-, medium-, and large-investor abnormal net-buying activities around these (non-pro-forma) matched-sample earnings announcements.

The untabulated results indicate that the forecast error based on GAAP operating earnings is significantly positively associated with MED_NETBUY, but only on the day of the earnings announcement. More importantly, the results also reveal that the I/B/E/S forecast error is significantly positively associated with both MED_NETBUY as well as LRG_NETBUY on all three days in the announcement window. These results suggest that sophisticated investors generally trade significantly around earnings announcements. Recall that MED_NETBUY is never associated with GAAP operating earnings surprise in our sample of adjusted-GAAP earnings announcements, and it is only associated with the I/B/E/S earnings surprise on day +1 relative to the announcement, while LRG_NETBUY is never associated with GAAP operating earnings or I/B/E/S actual earnings surprise. Thus, the lukewarm trading reaction of sophisticated investors we observe around pro forma earnings announcements is not attributable to the lack of power in our sophisticated investor proxies. Rather it appears that when firms announce adjusted-GAAP earnings numbers, sophisticated investors either refrain from actively trading during the announcement period, or trade cautiously later in the announcement window primarily using medium-sized trades.

Finally, the matched-sample results indicate that SML_NETBUY is significantly associated with forecast errors based on both GAAP operating income and I/B/E/S street earnings on the day of the earnings announcement. However, neither earnings surprise variable is incrementally informative relative to the other in explaining less-sophisticated investors' net-buying activities. Interestingly, we never find any evidence in our pro forma sample that less-sophisticated investors trade on information in GAAP operating

[34] For each of our pro forma firms, we first select all firms in the same Compustat size-decile (based on both market value of common equity and total assets) that are not part of our sample of pro forma announcers. From this pool, we then sequentially match on 4-digit, 3-digit and 2-digit SIC codes. If we obtain multiple matches based on this process within 4-, 3-, or 2-digit SIC codes for a given pro forma firm, we randomly select one of the available matches. In all instances, we use the match from the most specific industry code with available data for our regression analyses. Given that our comprehensive search string likely picks up the majority of adjusted-GAAP announcements during our sample period, our matched-firms, by and large, did not announce adjusted-GAAP earnings figures along with their audited GAAP earnings numbers in their earnings press releases. However, to the extent that our search string could miss actual adjusted-GAAP earnings numbers in matched-sample press releases, it would work against our finding differences in market reactions between our pro forma sample and matched-sample firms.

earnings, implying that when presented with both pro forma and GAAP operating figures, less-sophisticated investors focus on manager-adjusted pro forma information.[35]

An Alternative Specification to Assess the Sensitivity of the Results to the Errors-in-Variables Problem

Prior research discusses the potential ramifications of the classic errors-in-variables problem associated with using the mean analyst forecast as the expectation in calculating forecast errors for different earnings metrics (e.g., Bradshaw, 2003; BBCL, 2003; Berger, 2005). Since forecast tracking services, such as I/B/E/S, attempt to exclude the same items from the reported "street" earnings number that analysts exclude from their forecasts, the "street" forecast error will generally have less measurement error than forecast errors that match GAAP operating earnings or manager-adjusted pro forma earnings with analysts' expectation. In order to ensure that our results are not attributable to measurement error, we first use a random-walk earnings expectation based on GAAP operating earnings (as previously explained), and find qualitatively similar, though weaker results. Since the random-walk earnings expectation is a relatively outdated and inaccurate proxy for the market's expectation, the resulting earnings surprise measures are likely quite noisy (although the GAAP operating earnings forecast error based on this expectation is unbiased) and may reduce the power of the statistical tests. Therefore, we revisit the measurement error issue using a different approach. Gu and Chen's (2004) Figure 1 provides a useful framework for understanding how standard GAAP earnings measures differ from the street earnings numbers published by forecast tracking services (such as I/B/E/S). We extend this framework to illustrate how our three earnings

[35] We also perform alternative matched-sample analyses using a "within-sample" design in which we examine earnings announcements of our pro forma sample firms for quarters in which they do not disclose an adjusted-GAAP number (as defined by our comprehensive search string). We identify a "non-pro-forma" quarter for each of our sample observations by systematically going back four quarters and then forward four quarters from the pro forma announcement date until we find a quarter where managers do not disclose an adjusted-GAAP number (i.e., the earnings announcement is not captured by our search strings). We then repeat our main analyses on this set of "non-pro-forma" earnings announcements. We find that small investors trade on $FE_{GAAP\text{-}OP}$ on days 0 and +1 and on $FE_{I/B/E/S}$ on all three days during the announcement period. Medium investors also trade on $FE_{GAAP\text{-}OP}$ on day 0 and on $FE_{I/B/E/S}$ on all three days in the announcement window. However, we find no evidence that large investors trade on any of the forecast errors. Thus, sophisticated investors appear to use medium-sized trades in response to the GAAP operating earnings surprise on the day of the announcement and in response to the I/B/E/S actual earnings surprise throughout the announcement window. We note that when the same set of firms announce adjusted-GAAP earnings figures along with their standard GAAP earnings number, we find no evidence that either small or medium investors ever trade on GAAP operating earnings and medium investors only trade on I/B/E/S information on day +1. These analyses provide further support to the notion that sophisticated investors are skeptical about management-issued adjusted-GAAP profitability figures and trade more hesitantly when earnings announcements contain these disclosures.

metrics differ from one another and to motivate alternative specifications of our regression models that are not sensitive to the errors-in-variables problem.

We first briefly discuss the Gu and Chen (2004), hereafter GC, framework and then introduce our alternative model specifications. Figure 5 illustrates the main elements of the GC framework.[36] GC separate what they call "Core EPS" (which is essentially recurring income), from the transitory components of earnings (special items and below-the-line items). CORE_COMMON in the first chart of Figure 5 represents recurring items that are included in both GAAP operating earnings as well as analysts' definition of street earnings. Analysts generally exclude non-recurring special items from their street earnings number. We label special items excluded by analysts as SPEC_ANALEXC. GC also entertain the possibility that analysts choose to include some one-time special items in their definition of street earnings (SPEC_ANALINC). However, it is plausible that analysts choose to exclude some recurring items from street earnings that are part of core EPS (CORE_ANALEXC).[37] The brackets on the right side of the first chart of Figure 5 illustrate how different EPS measures are defined in the context of GC's framework: (1) GC's characterization of street earnings, (2) GAAP EPS before extraordinary items, (3) GAAP EPS after extraordinary items, and (4) comprehensive income.

[Insert Figure 5 about here]

Managers' definition of adjusted-GAAP earnings is usually similar to analysts' definition of street earnings except that managers frequently exclude additional core or recurring items that analysts do not exclude. In fact, Table 1 shows that $EPS_{PROFORMA}$ is significantly greater than $EPS_{I/B/E/S}$ implying that managers exclude expenses more aggressively than analysts. Thus, the second chart of Figure 5 includes a separate adjustment category for additional manager exclusions of recurring items (CORE_MGREXC)

[36] We use slightly different labels that we feel are more descriptive of the various earnings components mentioned in the GC framework.

[37] One noticeable difference between our characterization of the GC framework in Figure 5 and the original Gu and Chen (2004) Figure 1 is the placement of analysts' "other exclusions" (which we call CORE_ANALEXC). GC place analysts' additional exclusions between excluded one-time special items (which we call SPEC_ANALEXC) and extraordinary items in their Figure 1. However, we emphasize that one-time items are classified as "special items" or "below-the-line" extraordinary items for the vast majority of our observations. Thus, when analysts have "other exclusions," these exclusions are generally components of recurring income. Thus, we position other analyst exclusions (CORE_ANALEXC) in the core EPS section of the income statement and place this variable at the top of the "bar" in order to more easily isolate the components of different EPS measures.

beyond those made by analysts (CORE_ANALEXC).[38] The left side of the second chart illustrates the fact that analysts' street earnings can have several alternative definitions. Street EPS_1 illustrates a situation where analysts exclude all one-time items as well as at least one recurring item. Street EPS_2 represents a situation where analysts choose to include one or more special items (SPEC_ANALINC) and they exclude at least one recurring item (CORE_ANALEXC). Street EPS_3 includes one or more one-time items (SPEC_ANALINC), but does not exclude any recurring items. Finally, Street EPS_4 represents a situation where analysts exclude all one-time items and do not exclude any recurring items.

The brackets on the right side of the second chart depict our three EPS metrics. Note that our definition of GAAP operating EPS, $EPS_{GAAP\text{-}OP}$, always excludes special items and "below-the-line" items. Thus, $EPS_{GAAP\text{-}OP}$ equals recurring EPS or GC's "Core EPS" in this framework. GC focus on how analysts' treatment of special items affects investors' perceptions of these items. They find that special items that analysts choose to include in their street earnings number (SPEC_ANALINC) are perceived by investors to be more persistent than special items that analysts choose to exclude from street earnings (SPEC_ANALEXC). While this result is interesting, both analysts and managers exclude one-time items the vast majority of the time. Thus, the applicability of GC's results is limited to somewhat rare situations where analysts choose to *include* a one-time item. Consequently, we focus on the more general scenario where analysts (and managers) choose to *exclude* all one-time items. Therefore, although we acknowledge that some of our $EPS_{I/B/E/S}$ observations correspond to the Street EPS_2, Street EPS_3, or Street EPS_4 definitions, the vast majority of our $EPS_{I/B/E/S}$ observations map into Street EPS_1. Finally, as mentioned earlier, managers generally exclude all one-time items (Extraordinary Items, SPEC_ANALEXC, and SPEC_ANALINC) as well as additional recurring items beyond analysts' recurring exclusions. Thus, $EPS_{PROFORMA}$ simply represents CORE_COMMON in the second chart of Figure 5.

The advantage of the GC framework is that it allows us to investigate the extent to which investors focus on managers' incremental exclusions of recurring items (CORE_MGREXC) beyond those excluded by analysts. Recall that in this framework, CORE_MGREXC is simply the difference between $EPS_{PROFORMA}$ and $EPS_{I/B/E/S}$. Specifically, if a particular investor group trades on managers' incremental adjustments, we would

[38] We find that analysts' mean (median) exclusion of recurring items (CORE_ANALEXC), calculated as $EPS_{I/B/E/S} - EPS_{GAAP\text{-}OP}$, is \$0.07 (\$0.01) and that managers' mean (median) *incremental* exclusion of recurring items (CORE_MGREXC), calculated as $EPS_{PROFORMA} - EPS_{I/B/E/S}$, is \$0.10 (\$0.00).

expect CORE_MGREXC to be significantly positively associated with that group's abnormal trading response. Hence, we use an alternative specification of Model 3 that allows us to investigate the extent to which sophisticated vis-à-vis less-sophisticated investors react to managers' incremental adjustments:

$$SML\_NETBUY_{i,t} = \alpha_0 + \alpha_3 FE_{I/B/E/Si} + \alpha_4 CORE\_MGREXC + \alpha_5 SIZE_i + \alpha_6 MKTVOL_t + \varepsilon \quad (5a),$$

$$MED\_NETBUY_{i,t} = \beta_0 + \beta_3 FE_{I/B/E/Si} + \beta_4 CORE\_MGREXC + \beta_5 SIZE_i + \beta_6 MKTVOL_t + \varepsilon \quad (5b),$$

$$LRG\_NETBUY_{i,t} = \gamma_0 + \gamma_3 FE_{I/B/E/Si} + \gamma_4 CORE\_MGREXC + \gamma_5 SIZE_i + \gamma_6 MKTVOL_t + \varepsilon \quad (5c),$$

Where: CORE_MGREXC = $EPS_{PROFORMA}$ - $EPS_{I/B/E/S}$.

We employ $FE_{I/B/E/S}$ in these regressions to control for the earnings surprise since the (unbiased) I/B/E/S forecast error is the most accurate measure of surprise or "new information" in earnings. Specifically, this specification avoids the errors-in-variables problem because it does not match GAAP operating earnings or managers' pro forma earnings with analysts' consensus expectation to calculate the forecast error.

Thus, α_4, β_4, and γ_4 capture the incremental contribution of managers' additional exclusions of recurring items (beyond analysts' core exclusions) in explaining small, medium and large investors' abnormal net-buying activities, respectively. Since CORE_MGREXC equals $EPS_{PROFORMA}$ minus $EPS_{I/B/E/S}$, it is positive when $EPS_{PROFORMA}$ is greater than $EPS_{I/B/E/S}$. Consequently, a positive and significant α_4 would indicate that managers' incremental income increasing exclusions of recurring items prompt small investors to intensify their abnormal net-buying activities, an indication that small investors trade based on managers' pro forma adjustments. Likewise, medium (large) investors' increased abnormal net-buying activities in response to managers' incremental income increasing exclusions would result in a significantly positive β_4 (γ_4) coefficient.

Table 5 reports the results of estimating these regressions. The first panel reports Model 5a results and indicates that the coefficient on $FE_{I/B/E/S}$, α_3, is significantly positive on day 0 while the coefficient on CORE_MGREXC, α_4, is significantly negative. Thus, it appears that a subset of small investors decreases their abnormal net-buying activities on the day of the announcement when managers voluntarily disclose income increasing adjusted-GAAP earnings figures. In contrast, α_4 is highly significantly positive on day +1 (as is α_3). Thus, small investors appear to intensify their abnormal net-buying activities the day after the earnings announcement in response to managers' income increasing exclusions of recurring items, suggesting that managers' adjusted-GAAP disclosures influence small investors' trading decisions. The second panel

reports results for Model 5b (medium orders) and reveals that while the coefficient on $FE_{I/B/E/S}$, β_3, is significant on day +1, the coefficient on CORE_MGREXC, β_4, is never statistically significant, suggesting that medium-sized investors do not buy incrementally more based on managers' incremental exclusions. Finally, the third panel repeats the same regressions for large orders (Model 5c) and shows that neither γ_3 nor γ_4 is ever significant, suggesting that large investors' trading activities are not associated with the forecast error or manager's exclusions during the announcement period.

[Insert Table 5 about here]

Taken together, these analyses are highly consistent with our main results. We find that managers' income increasing exclusions of recurring items beyond analysts' exclusions significantly increase abnormal net-buying activities of less-sophisticated investors (i.e., the small trade-size group), but have no impact on the abnormal net-buying activities of sophisticated investors (i.e., the medium and large trade-size groups). Since this specification circumvents the errors-in-variables problem, our main inference–that primarily less-sophisticated investors trade on information in pro forma earnings, while more-sophisticated investors do not trade on pro forma earnings information—is robust to concerns about measurement error.

VI. Conclusion

Regulators and standard setters have expressed concern that managers' pro forma disclosures are incomplete, inaccurate, and misleading to investors. Recent experimental research suggests that more- versus less-sophisticated investors may respond differently to these non-standard, adjusted-GAAP earnings measures disclosed by managers. Since less-wealthy, individual investors lack the necessary sophistication to understand the accuracy and reliability of these disclosures, they are most at risk of being misled. Consequently, this study examines intraday transactions around 5,736 earnings announcements that accompany pro forma disclosures between January 1998 and December 2003 to investigate which class of investors primarily trades on pro forma earnings information: sophisticated institutional investors, less-wealthy and less-sophisticated individual investors, or both.

Our results suggest that the earnings surprise based on pro forma earnings is significantly positively associated with the abnormal net-buying activities of the less-sophisticated, primarily individual class of investors on the day after the announcement. The results also indicate that the pro forma earnings surprise is

significantly incrementally informative relative to the earnings surprise measures based on GAAP operating earnings and I/B/E/S actual earnings in explaining less-sophisticated investors' announcement-period abnormal net-buying activities. We find that less-sophisticated investors also trade based on the I/B/E/S earnings surprise, which is incrementally informative relative to the pro forma and GAAP earnings surprises. In sharp contrast, we find that sophisticated investors either avoid trading around pro forma earnings announcements, or they trade later in the announcement period (only on day +1) based on information in I/B/E/S actual earnings, but they never trade based on manager-disclosed pro forma earnings information. In order to further investigate the seemingly "lukewarm" trading responses of sophisticated investors around earnings announcements containing management-issued pro forma figures, we investigate a matched sample of earnings announcements of firms that do not voluntarily disclose pro forma numbers. This additional analysis suggests that the lukewarm trading reaction of sophisticated investors is not attributable to the lack of power in our sophisticated investor proxies because these investors appear to trade significantly around the earnings announcements of the matched sample. Thus, it appears that when firms announce adjusted-GAAP earnings numbers, sophisticated investors either refrain from actively trading during the announcement period, or trade cautiously later in the announcement window. Overall, our results suggest that the market reaction to pro forma earnings information is almost exclusively attributable to the less-sophisticated investors.

A caveat in our research design is that it is susceptible to measurement errors introduced by the errors-in-variables problem. This problem arises because forecast tracking services, such as I/B/E/S, attempt to exclude the same items from their "street" earnings number that analysts exclude from their forecasts. Thus, the I/B/E/S forecast error generally has less measurement error than forecast errors computed by subtracting the mean analysts' forecast from GAAP operating earnings or manager-adjusted pro forma earnings. In order to ensure that our results are not attributable to measurement error, we extend the Gu and Chen (2004) framework to motivate an alternative specification that allows us to examine investors' reactions to managers' incremental earnings adjustments beyond those made by analysts after controlling for earnings surprise. We subtract analysts' mean forecast from I/B/E/S actual EPS figure to measure earnings surprise. Since this earnings surprise measure does not suffer from the measurement error introduced by mismatching different definitions of earnings, this specification likely circumvents the errors-in-variables problem. Results

of estimating this alternative specification indicate that less-sophisticated investors' abnormal net-buying activities are significantly positively associated with the magnitude and direction of managers' incremental adjustments beyond analysts' adjustments even after appropriately controlling for earnings surprise. However, managers' incremental adjustments have no impact on the abnormal net-buying activities of sophisticated investors. These results show that the study's main inference that primarily less-sophisticated investors trade on information in pro forma earnings, while more-sophisticated investors do not, is robust to concerns about measurement error.

These results have relevance in the post-Enron and post-SOX regulatory and disclosure environment. Legislators and regulators are increasingly concerned regarding the proliferation of pro forma earnings figures published by managers, and early evidence suggests that these disclosures may be misleading and strategically motivated. Thus, our evidence that less-sophisticated, primarily individual investors trade on pro forma earnings information, while sophisticated institutional investors do not, is relevant to standard setters and regulators mandating and monitoring corporate disclosures to protect the interests of potentially less-informed investors.

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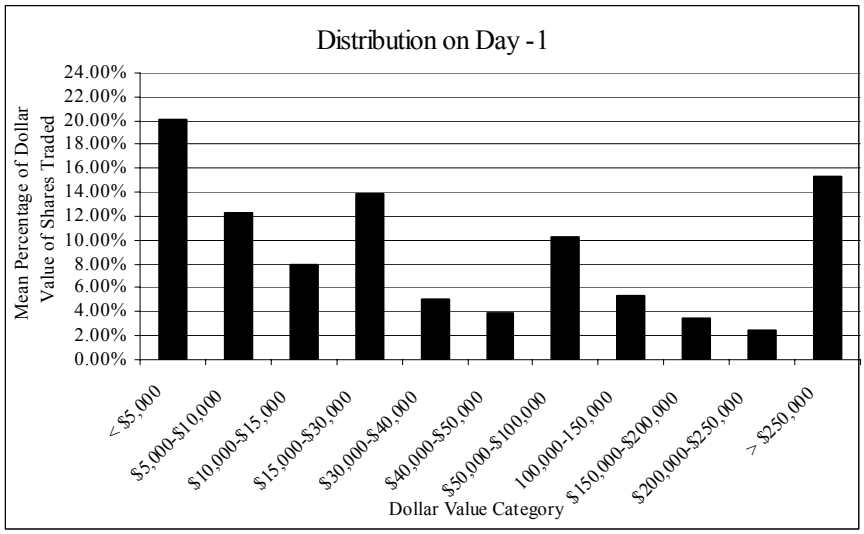
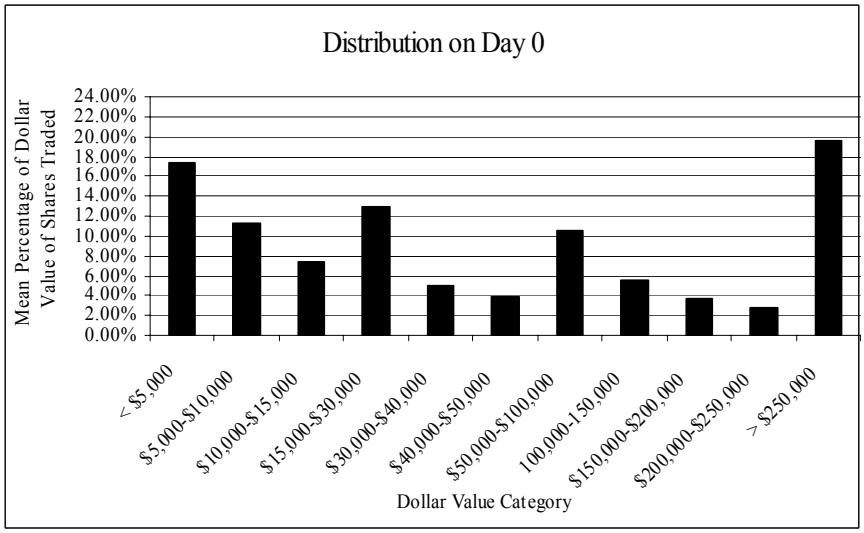
FIGURE 1
Distribution of Average Dollar Value of Shares Traded During the Announcement Period





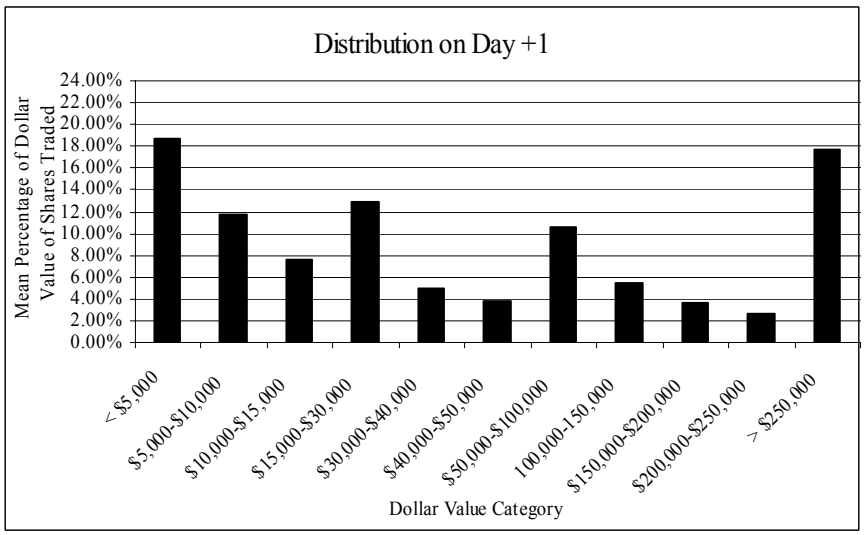
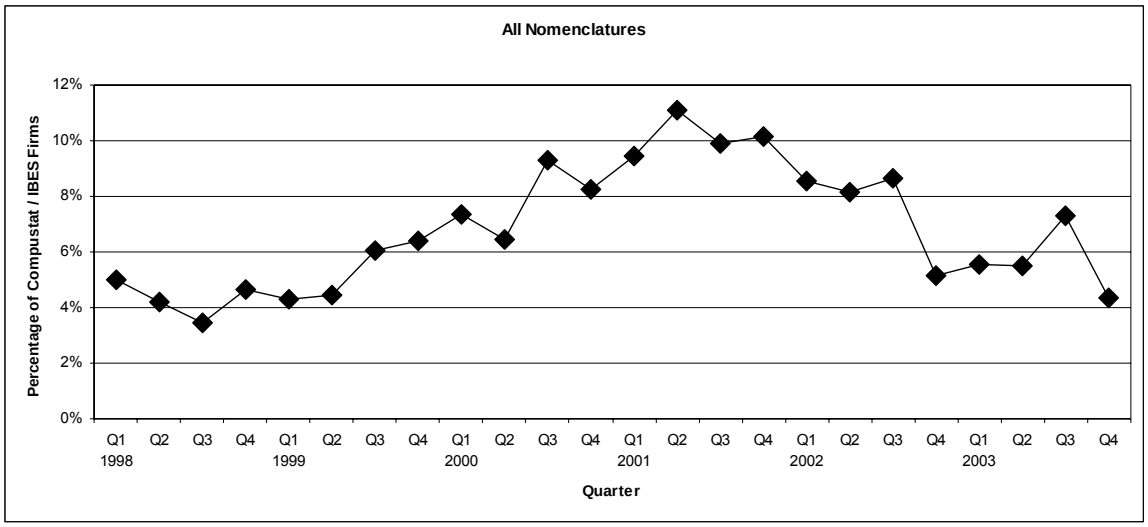
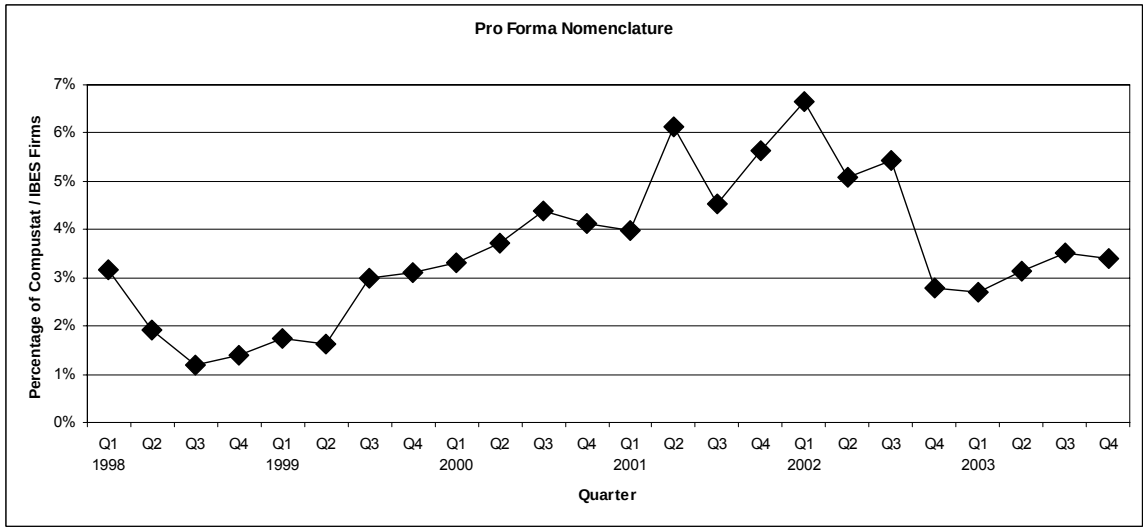


FIGURE 2
The Percentage of Firms on both Compustat and I/B/E/S Reporting Adjusted-GAAP Earnings





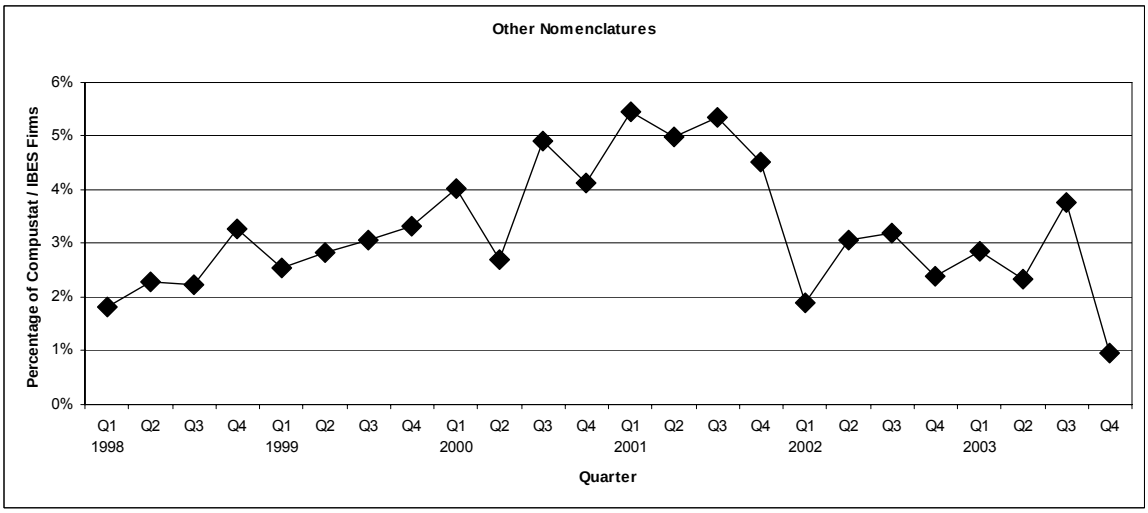


FIGURE 3
Industry Classification of Adjusted-GAAP Firms Relative to the Compustat and I/B/E/S Populations

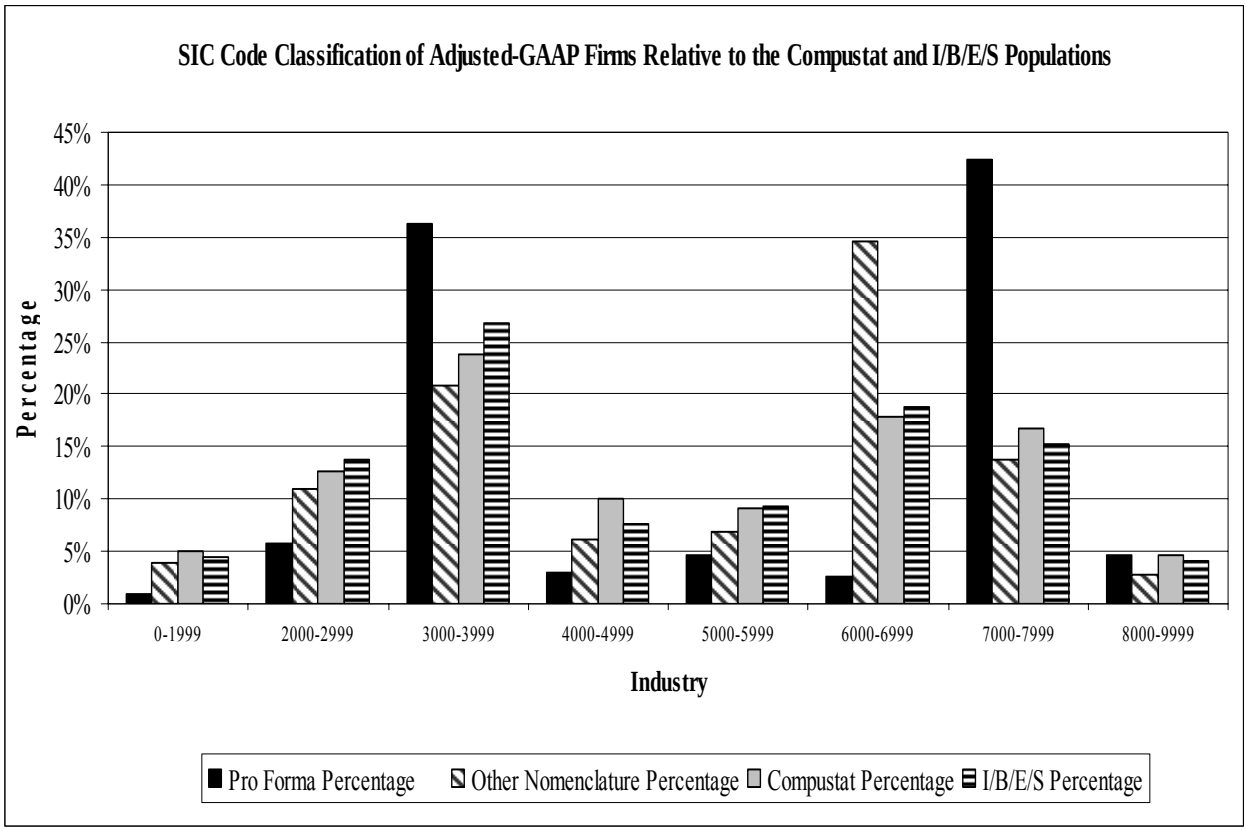


FIGURE 4
Frequency of Adjusted-GAAP Reporting During the Sample Period

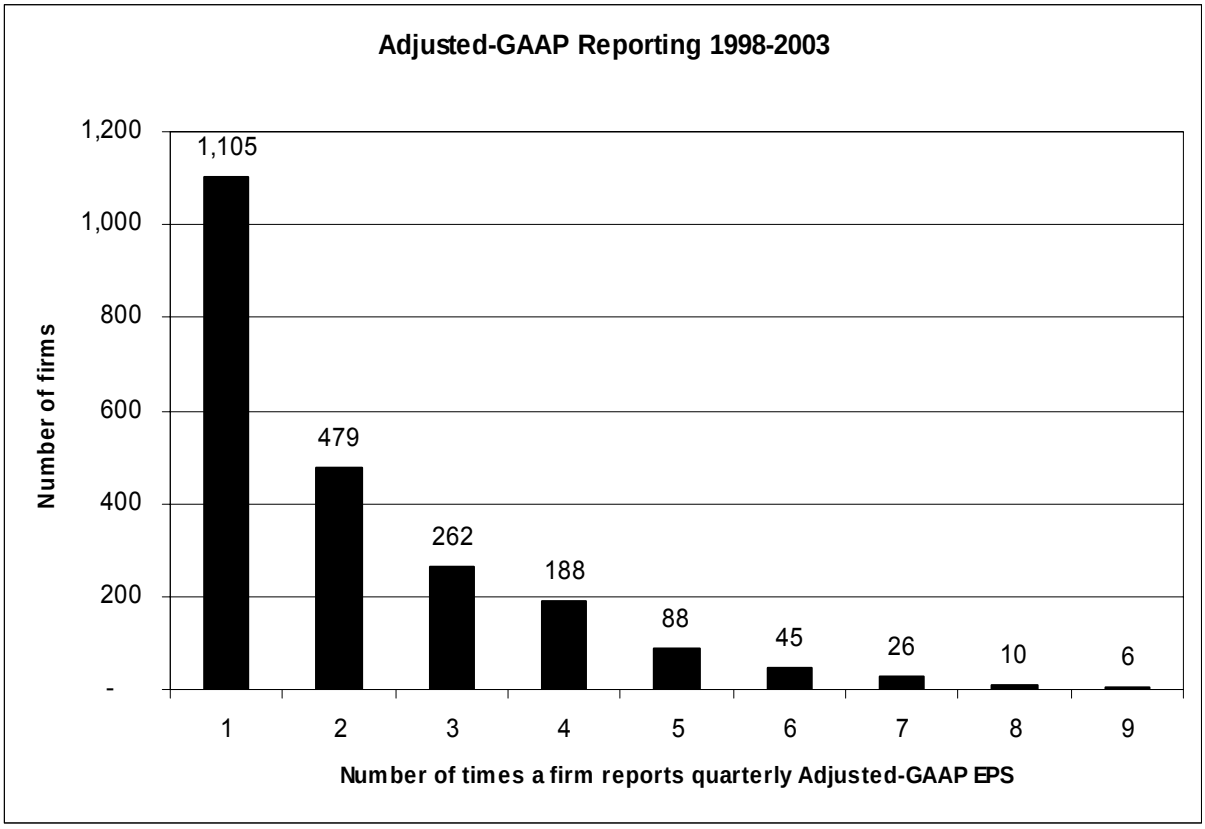
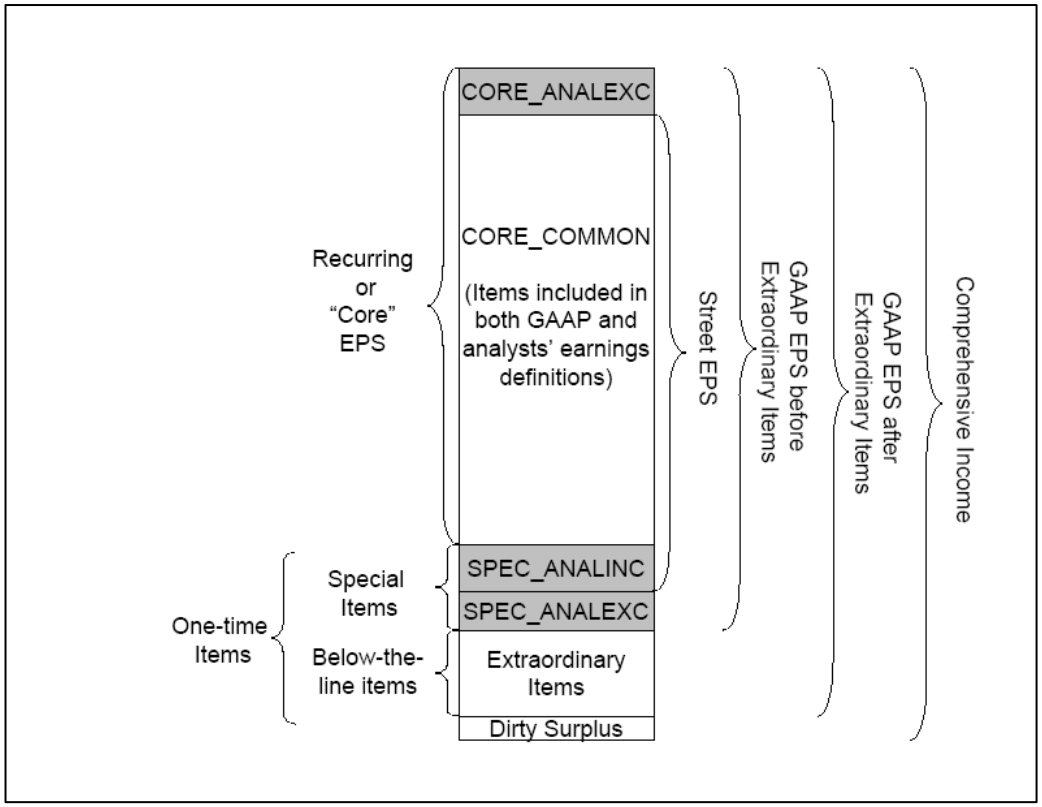


FIGURE 5
Comparison of Our Earnings Metrics to the Gu and Chen (2004) Framework



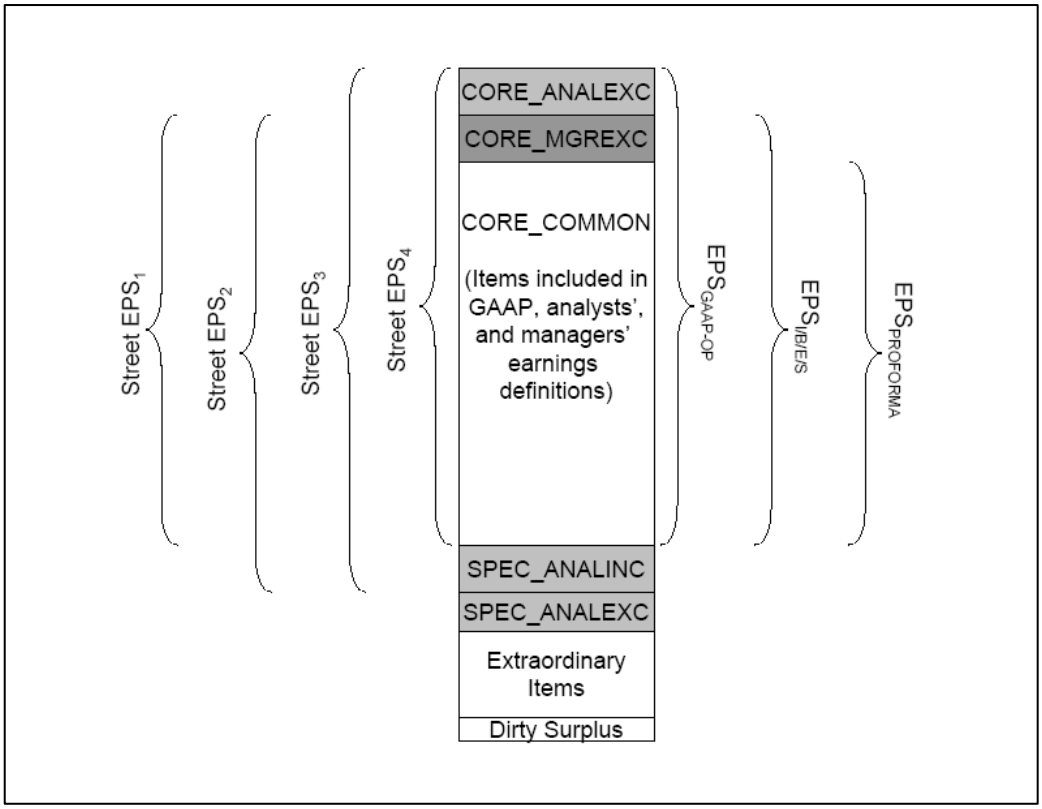


TABLE 1
Comparison of Our Earnings Metrics to the Gu and Chen (2004) Framework

Panel A: Firm Characteristics, Earnings Metrics, and Forecast Errors

Variable[1]	25th Percentile	Mean	Median	75th Percentile
SIZE	185.034	6,172.211	620.780	2,458.769
PRICE	8.680	25.088	17.562	31.500
$EPS_{GAAP-OP}$	-0.121	0.059	0.090	0.330
$EPS_{I/B/E/S}$	-0.030	0.128	0.130	0.310
$EPS_{PROFORMA}$	-0.010	0.223	0.150	0.390
$FE_{GAAP-OP}$	0.000	-0.009	0.000	0.000
$FE_{I/B/E/S}$	0.000	0.025	0.000	0.001
$FE_{PROFORMA}$	0.000	0.114	0.001	0.003

Panel B: Order Imbalance Variables

Variable[1]	25th Percentile	Mean	Median	75th Percentile
SML_NETBUY_{-1}	-0.017	0.010	0.000	0.024
SML_NETBUY_{0}	-0.016	0.010	0.001	0.028
SML_NETBUY_{+1}	-0.013	0.019	0.003	0.025
MED_NETBUY_{-1}	-0.045	0.011	0.003	0.057
MED_NETBUY_{0}	-0.048	0.019	0.009	0.074
MED_NETBUY_{+1}	-0.037	0.013	0.006	0.054
LRG_NETBUY_{-1}	-0.111	-0.011	0.005	0.140
LRG_NETBUY_{0}	-0.130	-0.024	0.006	0.183
LRG_NETBUY_{+1}	-0.097	-0.021	0.005	0.123

[1]Statistics for all variables are based on 5,736 observations.

SIZE = Total assets in $ millions at the end of the previous quarter

PRICE = Stock price five days before the pro forma earnings announcement date

$EPS_{GAAP-OP}$ = Compustat diluted operating earnings per share

$EPS_{PROFORMA}$ = Managers' Adjusted-GAAP earnings per share from the press release

$EPS_{I/B/E/S}$ = I/B/E/S actual earnings per share

$FE_{GAAP-OP}$ = Forecast error calculated as Compustat diluted operating EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$FE_{PROFORMA}$ = Forecast error calculated as managers' Adjusted-GAAP EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$FE_{I/B/E/S}$ = Forecast error calculated as I/B/E/S actual EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

SML_NETBUY = Abnormal net-buy volume (buy-volume less sell-volume) of small investors (all trades less than or equal to $7,000) on day t relative to the earnings announcement date scaled by non-announcement period total volume.

MED_NETBUY = Abnormal net-buy volume (buy-volume less sell-volume) of medium-sized investors (all trades greater than $7,000 and less than or equal to $50,000) on day t relative to earnings announcement date scaled by non-announcement period total volume.

LRG_NETBUY = Abnormal net-buy volume (buy-volume less sell-volume) of large investors (all trades greater $50,000) on day t relative to the earnings announcement date scaled by non-announcement period total volume.

TABLE 2
Small Investors' Abnormal Net-Buy Volume Regressed on the GAAP Operating Earnings Forecast Error, Pro Forma Forecast Error, I/B/E/S Forecast Error, and Control Variables (Based on 5,736 Pro Forma Press Releases Issued between 1998 and 2003)

Model 1: $SML\_NETBUY_{i,t} = \alpha_0 + \alpha_1 FE_{GAAP\text{-}OPi} + \alpha_4 SIZE_i + \alpha_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (α_0)	Coefficient on $FE_{GAAP\text{-}OPi}$ (α_1)	Coefficient on $SIZE_i$ (α_4)	Coefficient on $MKTVOL_t$ (α_5)	Adjusted-R^2
Day -1	0.006	-0.021	-0.001	0.001	-0.02%
	(0.65)	(-0.73)	(-1.00)	(0.49)	
Day 0	-0.002	0.028	0.000	0.002	-0.02%
	(-0.19)	(0.77)	(-0.00)	(1.06)	
Day +1	0.054	0.027	-0.008	0.002	1.94%
	(6.14)***	(0.99)	(-10.60)***	(2.09)**	

Model 2: $SML\_NETBUY_{i,t} = \alpha_0 + \alpha_2 FE_{PROFORMAi} + \alpha_4 SIZE_i + \alpha_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (α_0)	Coefficient on $FE_{PROFORMAi}$ (α_2)	Coefficient on $SIZE_i$ (α_4)	Coefficient on $MKTVOL_t$ (α_5)	Adjusted-R^2
Day -1	0.008	-0.045	-0.001	0.001	0.02%
	(0.81)	(-1.70)*	(-1.28)	(0.58)	
Day 0	-0.002	-0.028	0.000	0.002	-0.02%
	(-0.13)	(-0.83)	(-0.09)	(1.05)	
Day +1	0.048	0.224	-0.007	0.002	3.37%
	(5.46)***	(9.27)***	(-9.14)***	(1.59)	

Model 3: $SML\_NETBUY_{i,t} = \alpha_0 + \alpha_3 FE_{I/B/E/Si} + \alpha_4 SIZE_i + \alpha_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (α_0)	Coefficient on $FE_{I/B/E/Si}$ (α_3)	Coefficient on $SIZE_i$ (α_4)	Coefficient on $MKTVOL_t$ (α_5)	Adjusted-R^2
Day -1	0.006	0.069	-0.001	0.001	-0.02%
	(0.64)	(0.62)	(-1.01)	(0.53)	
Day 0	-0.004	0.539	0.000	0.002	0.21%
	(-0.31)	(3.74)***	(0.18)	(1.05)	
Day +1	0.052	0.600	-0.008	0.002	2.48%
	(5.98)***	(5.73)***	(-10.34)***	(2.04)**	

TABLE 2 Continued

Model 4: $SML\_NETBUY_{i,t} = \alpha_0 + \alpha_1 FE_{GAAP\text{-}OPi} + \alpha_2 FE_{PROFORMAi} + \alpha_3 FE_{I/B/E/Si} + \alpha_4 SIZE_i + \alpha_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (α_0)	Coefficient on $FE_{GAAP\text{-}OPi}$ (α_1)	Coefficient on $FE_{PROFORMAi}$ (α_2)	Coefficient on $FE_{I/B/E/Si}$ (α_3)	Coefficient on $SIZE_i$ (α_4)	Coefficient on $MKTVOL_t$ (α_5)	Adjusted-R^2	*F*-Test H_o: $\alpha_1 = \alpha_2$	*F*-Test H_o: $\alpha_1 = \alpha_3$	*F*-Test H_o: $\alpha_2 = \alpha_3$
Day -1	0.007	-0.016	-0.049	0.143	-0.001	0.001	0.01%	0.50	1.46	2.24
	(0.79)	(-0.51)	(-1.75)*	(1.19)	(-1.22)	(0.55)				
Day 0	-0.002	0.004	-0.067	0.610	0.000	0.002	0.24%	1.36	13.02***	16.93***
	(-0.19)	(0.09)	(-1.85)*	(3.96)***	(-0.10)	(1.15)				
Day +1	0.046	-0.077	0.217	0.433	-0.007	0.002	3.65%	46.75***	17.60***	3.28*
	(5.30)***	(-2.66)***	(8.41)***	(3.89)***	(-8.82)***	(1.50)				

[1]Parameter estimates reported first followed by t-statistics in parentheses

* significant at the 0.10 level (two-tailed)

** significant at the 0.05 level (two-tailed)

***significant at the 0.01 level (two-tailed)

$SML\_NETBUY_{i,t}$ = Abnormal net-buy volume (buy-volume less sell-volume) of small investors (all trades less than or equal to $7,000) on day t relative to the earnings announcement date.

$FE_{GAAP\text{-}OPi}$ = *Signed f*orecast error calculated as Compustat diluted operating EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$FE_{PROFORMAi}$ = *Signed f*orecast error calculated as managers' Adjusted-GAAP EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$FE_{I/B/E/Si}$ = *Signed f*orecast error calculated as I/B/E/S actual EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$SIZE_i$ = The log of total assets in $ millions at the end of the previous quarter

$MKTVOL_t$ = Total market volume of all firms on CRSP on day t scaled by the total number of shares outstanding on day t

TABLE 3
Medium-Sized Investors' Abnormal Net-Buy Volume Regressed on the GAAP Operating Earnings Forecast Error, Pro Forma Forecast Error, I/B/E/S Forecast Error, and Control Variables (Based on 5,736 Pro Forma Press Releases Issued between 1998 and 2003)

Model 1: $MED\_NETBUY_{i,t} = \beta_0 + \beta_1 FE_{GAAP\text{-}OPi} + \beta_4 SIZE_i + \beta_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (β_0)	Coefficient on $FE_{GAAP\text{-}OPi}$ (β_1)	Coefficient on $SIZE_i$ (β_4)	Coefficient on $MKTVOL_t$ (β_5)	Adjusted-R^2
Day -1	0.006	-0.071	0.000	0.000	-0.01%
	(0.43)	(-1.57)	(0.20)	(0.19)	
Day 0	0.024	0.053	0.000	-0.001	-0.03%
	(1.39)	(1.02)	(0.14)	(-0.51)	
Day +1	0.023	0.022	0.000	-0.001	-0.03%
	(1.90)*	(0.61)	(-0.40)	(-0.89)	

Model 2: $MED\_NETBUY_{i,t} = \beta_0 + \beta_2 FE_{PROFORMAi} + \beta_4 SIZE_i + \beta_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (β_0)	Coefficient on $FE_{PROFORMAi}$ (β_2)	Coefficient on $SIZE_i$ (β_4)	Coefficient on $MKTVOL_t$ (β_5)	Adjusted-R^2
Day -1	0.009	-0.057	0.000	0.001	-0.02%
	(0.58)	(-1.41)	(-0.09)	(0.30)	
Day 0	0.025	-0.019	0.000	-0.001	-0.04%
	(1.41)	(-0.40)	(0.13)	(-0.55)	
Day +1	0.023	-0.021	0.000	-0.001	-0.03%
	(1.92)*	(-0.65)	(-0.46)	(-0.88)	

Model 3: $MED\_NETBUY_{i,t} = \beta_0 + \beta_3 FE_{I/B/E/Si} + \beta_4 SIZE_i + \beta_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (β_0)	Coefficient on $FE_{I/B/E/Si}$ (β_3)	Coefficient on $SIZE_i$ (β_4)	Coefficient on $MKTVOL_t$ (β_5)	Adjusted-R^2
Day -1	0.007	-0.090	0.000	0.000	-0.05%
	(0.46)	(-0.51)	(0.10)	(0.27)	
Day 0	0.023	0.235	0.000	-0.001	-0.02%
	(1.34)	(1.17)	(0.24)	(-0.56)	
Day +1	0.022	0.354	0.000	-0.001	0.07%
	(1.81)*	(2.49)**	(-0.26)	(-0.93)	

TABLE 3 Continued

Model 4: $MED\_NETBUY_{i,t} = \beta_0 + \beta_1 FE_{GAAP\text{-}OPi} + \beta_2 FE_{PROFORMAi} + \beta_3 FE_{I/B/E/Si} + \beta_4 SIZE_i + \beta_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (β_0)	Coefficient on $FE_{GAAP\text{-}OPi}$ (β_1)	Coefficient on $FE_{PROFORMAi}$ (β_2)	Coefficient on $FE_{I/B/E/Si}$ (β_3)	Coefficient on $SIZE_i$ (β_4)	Coefficient on $MKTVOL_t$ (β_5)	Adjusted-R^2	*F*-Test H_o: $\beta_1 = \beta_2$	*F*-Test H_o: $\beta_1 = \beta_3$	*F*-Test H_o: $\beta_2 = \beta_3$
Day -1	0.008	-0.058	-0.043	0.027	0.000	0.000	-0.03%	0.04	0.17	0.12
	(0.52)	(-1.20)	(-0.98)	(0.14)	(0.04)	(0.23)				
Day 0	0.025	0.051	-0.047	0.228	0.000	-0.001	-0.03%	1.35	0.57	1.43
	(1.41)	(0.90)	(-0.93)	(1.06)	(0.04)	(-0.45)				
Day +1	0.023	0.007	-0.049	0.403	0.000	-0.001	0.07%	0.92	5.68**	7.69***
	(1.91)*	(0.19)	(-1.39)	(2.65)***	(-0.47)	(-0.84)				

[1]Parameter estimates reported first followed by t-statistics in parentheses

* significant at the 0.10 level (two-tailed)

** significant at the 0.05 level (two-tailed)

***significant at the 0.01 level (two-tailed)

$MED\_NETBUY_{i,t}$ = Abnormal net-buy volume (buy-volume less sell-volume) of medium-sized investors (all trades greater than $7,000 and less than or equal to $50,000) on day t relative to the earnings announcement date.

$FE_{GAAP\text{-}OPi}$ = *Signed f*orecast error calculated as Compustat diluted operating EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$FE_{PROFORMAi}$ = *Signed f*orecast error calculated as managers' Adjusted-GAAP EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$FE_{I/B/E/Si}$ = *Signed f*orecast error calculated as I/B/E/S actual EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$SIZE_i$ = The log of total assets in $ millions at the end of the previous quarter

$MKTVOL_t$ = Total market volume of all firms on CRSP on day t scaled by the total number of shares outstanding on day t

TABLE 4
Large Investors' Abnormal Net-Buy Volume Regressed on the GAAP Operating Earnings Forecast Error, Pro Forma Forecast Error, I/B/E/S Forecast Error, and Control Variables (Based on 5,736 Pro Forma Press Releases Issued between 1998 and 2003)

Model 1: $LRG\_NETBUY_{i,t} = \gamma_0 + \gamma_1 FE_{GAAP\text{-}OPi} + \gamma_4 SIZE_i + \gamma_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (γ_0)	Coefficient on $FE_{GAAP\text{-}OPi}$ (γ_1)	Coefficient on $SIZE_i$ (γ_4)	Coefficient on $MKTVOL_t$ (γ_5)	Adjusted-R^2
Day -1	-0.027	0.070	0.007	-0.002	0.04%
	(-0.71)	(0.62)	(2.09)**	(-0.41)	
Day 0	-0.147	0.199	0.015	0.006	0.29%
	(-3.13)***	(1.42)	(3.97)***	(1.11)	
Day +1	0.029	-0.002	0.001	-0.002	-0.04%
	(1.18)	(-0.03)	(0.39)	(-0.77)	

Model 2: $LRG\_NETBUY_{i,t} = \gamma_0 + \gamma_2 FE_{PROFORMAi} + \gamma_4 SIZE_i + \gamma_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (γ_0)	Coefficient on $FE_{PROFORMAi}$ (γ_2)	Coefficient on $SIZE_i$ (γ_4)	Coefficient on $MKTVOL_t$ (γ_5)	Adjusted-R^2
Day -1	-0.031	0.124	0.007	-0.002	0.05%
	(-0.83)	(1.19)	(2.27)**	(-0.47)	
Day 0	-0.149	0.044	0.016	0.006	0.25%
	(-3.15)***	(0.35)	(4.06)***	(1.01)	
Day +1	0.030	-0.043	0.001	-0.002	-0.03%
	(1.22)	(-0.63)	(0.29)	(-0.74)	

Model 3: $LRG\_NETBUY_{i,t} = \gamma_0 + \gamma_3 FE_{I/B/E/Si} + \gamma_4 SIZE_i + \gamma_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (γ_0)	Coefficient on $FE_{I/B/E/Si}$ (γ_3)	Coefficient on $SIZE_i$ (γ_4)	Coefficient on $MKTVOL_t$ (γ_5)	Adjusted-R^2
Day -1	-0.027	0.084	0.007	-0.002	0.03%
	(-0.73)	(0.19)	(2.13)**	(-0.44)	
Day 0	-0.148	0.095	0.016	0.006	0.25%
	(-3.14)***	(0.17)	(4.06)***	(1.03)	
Day +1	0.029	0.174	0.001	-0.002	-0.03%
	(1.16)	(0.59)	(0.41)	(-0.78)	

TABLE 4 Continued

Model 4: $LRG\_NETBUY_{i,t} = \gamma_0 + \gamma_1 FE_{GAAP\text{-}OPi} + \gamma_2 FE_{PROFORMAi} + \gamma_3 FE_{I/B/E/Si} + \gamma_4 SIZE_i + \gamma_5 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (γ_0)	Coefficient on $FE_{GAAP\text{-}OPi}$ (γ_1)	Coefficient on $FE_{PROFORMAi}$ (γ_2)	Coefficient on $FE_{I/B/E/Si}$ (γ_3)	Coefficient on $SIZE_i$ (γ_4)	Coefficient on $MKTVOL_t$ (γ_5)	Adjusted-R^2	*F*-Test H_o: $\gamma_1 = \gamma_2$	*F*-Test H_o: $\gamma_1 = \gamma_3$	*F*-Test H_o: $\gamma_2 = \gamma_3$
Day -1	-0.031	0.038	0.119	-0.094	0.007	-0.002	0.02%	0.19	0.06	0.18
	(-0.81)	(0.30)	(1.07)	(-0.20)	(2.23)**	(-0.45)				
Day 0	-0.147	0.213	-0.006	-0.149	0.015	0.006	0.25%	0.93	0.32	0.05
	(-3.11)***	(1.40)	(-0.05)	(-0.26)	(3.89)***	(1.11)				
Day +1	0.030	-0.002	-0.058	0.245	0.001	-0.002	-0.06%	0.21	0.51	0.79
	(1.21)	(-0.02)	(-0.79)	(0.77)	(0.29)	(-0.73)				

[1]Parameter estimates reported first followed by t-statistics in parentheses

* significant at the 0.10 level (two-tailed)

** significant at the 0.05 level (two-tailed)

***significant at the 0.01 level (two-tailed)

$LRG\_NETBUY_{i,t}$ = Abnormal net-buy volume (buy-volume less sell-volume) of large investors (all trades greater $50,000) on day t relative to the earnings announcement date.

$FE_{GAAP\text{-}OPi}$ = *Signed f*orecast error calculated as Compustat diluted operating EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$FE_{PROFORMAi}$ = *Signed f*orecast error calculated as managers' Adjusted-GAAP EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$FE_{I/B/E/Si}$ = *Signed f*orecast error calculated as I/B/E/S actual EPS minus the I/B/E/S mean forecast, scaled by price on day t-5

$SIZE_i$ = The log of total assets in $ millions at the end of the previous quarter

$MKTVOL_t$ = Total market volume of all firms on CRSP on day t scaled by the total number of shares outstanding on day t

TABLE 5

The Impact of Managers' Incremental Adjustments beyond Analysts' Exclusions on Small, Medium, and Large Investor Abnormal Net-Buy Volume after Controlling for the I/B/E/S Forecast Error (Based on 5,736 Pro Forma Press Releases Issued between 1998 and 2003)[1]

Model 5a: $SML\_NETBUY_{i,t} = \alpha_0 + \alpha_3 FE_{I/B/E/Si} + \alpha_4 CORE\_MGREXC + \alpha_5 SIZE_i + \alpha_6 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (α_0)	Coefficient on $FE_{I/B/E/Si}$ (α_3)	Coefficient on $CORE\_MGREXC_i$ (α_4)	Coefficient on $SIZE_i$ (α_5)	Coefficient on $MKTVOL_t$ (α_6)	Adjusted-R^2
Day -1	0.007	0.068	-0.041	-0.001	0.001	-0.00%
	(0.77)	(0.61)	(-1.48)	(-1.21)	(0.57)	
Day 0	-0.002	0.538	-0.074	-0.000	0.002	0.27%
	(-0.19)	(3.74)***	(-2.07)**	(-0.11)	(1.16)	
Day +1	0.048	0.591	0.194	-0.007	0.002	3.43%
	(5.45)***	(5.67)***	(7.55)***	(-9.23)***	(1.68)*	

Model 5b: $MED\_NETBUY_{i,t} = \beta_0 + \beta_3 FE_{I/B/E/Si} + \beta_4 CORE\_MGREXC + \beta_5 SIZE_i + \beta_6 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (β_0)	Coefficient on $FE_{I/B/E/Si}$ (β_3)	Coefficient on $CORE\_MGREXC_i$ (β_4)	Coefficient on $SIZE_i$ (β_5)	Coefficient on $MKTVOL_t$ (β_6)	Adjusted-R^2
Day -1	0.008	-0.091	-0.053	0.000	0.001	-0.04%
	(0.56)	(-0.52)	(-1.21)	(-0.07)	(0.30)	
Day 0	0.025	0.234	-0.064	0.000	-0.001	-0.01%
	(1.42)	(1.16)	(-1.28)	(0.06)	(-0.49)	
Day +1	0.023	0.357	-0.056	-0.005	-0.001	0.10%
	(1.93)*	(2.51)**	(-1.61)	(-0.48)	(-0.85)	

Model 5c: $LRG\_NETBUY_{i,t} = \gamma_0 + \gamma_3 FE_{I/B/E/Si} + \gamma_4 CORE\_MGREXC + \gamma_5 SIZE_i + \gamma_6 MKTVOL_t + \varepsilon$

Observation Interval	Intercept (γ_0)	Coefficient on $FE_{I/B/E/Si}$ (γ_3)	Coefficient on $CORE\_MGREXC_i$ (γ_4)	Coefficient on $SIZE_i$ (γ_5)	Coefficient on $MKTVOL_t$ (γ_6)	Adjusted-R^2
Day -1	-0.032	0.087	0.163	0.007	-0.002	0.05%
	(-0.85)	(0.20)	(1.48)	(2.31)**	(-0.49)	
Day 0	-0.148	0.095	0.005	0.016	0.006	0.24%
	(-3.13)***	(0.17)	(0.04)	(4.02)***	(1.03)	
Day +1	0.030	0.177	-0.062	0.001	-0.002	-0.04%
	(1.22)	(0.60)	(-0.85)	(0.29)	(-0.73)	

TABLE 5 Continued

[1]Parameter estimates reported first followed by t-statistics in parentheses

* significant at the 0.10 level (two-tailed)

** significant at the 0.05 level (two-tailed)

***significant at the 0.01 level (two-tailed)

$SML\_NETBUY_{i,t}$	= Abnormal net-buy volume (buy-volume less sell-volume) of small investors (all trades less than or equal to $7,000) on day t relative to the earnings announcement date.
MED_NETBUYi,t	= Abnormal net-buy volume (buy-volume less sell-volume) of medium-sized investors (all trades greater than $7,000 and less than or equal to $50,000) on day t relative to the earnings announcement date.
LRG_NETBUYi,t	= Abnormal net-buy volume (buy-volume less sell-volume) of large investors (all trades greater $50,000) on day t relative to the earnings announcement date.
$FE_{I/B/E/Si}$	= *Signed f*orecast error calculated as I/B/E/S actual EPS minus the I/B/E/S mean forecast, scaled by price on day t-5
$CORE\_MGREXC_i$	= Managers' incremental adjustments to earnings beyond those made by analysts (calculated as $EPS_{PROFORMA}$ - $EPS_{I/B/E/S}$).
$SIZE_i$	= The log of total assets in $ millions at the end of the previous quarter
$MKTVOL_t$	= Total market volume of all firms on CRSP on day t scaled by the total number of shares outstanding on day t