What do measures of real-time corporate sales tell us about earnings surprises and post-announcement returns?

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Abstract

We develop real-time proxies of retail corporate sales from multiple sources, including ~50 million mobile devices. These measures contain information from both the earnings quarter ("within quarter") and the period between that quarter's end and the earnings announcement date ("post quarter"). Our within-quarter measure is powerful in explaining quarterly sales growth, revenue surprises and earnings surprises, generating average excess announcement returns of 3.4%. However, surprisingly, our post-quarter measure is related negatively to announcement returns, and positively to post-announcement returns. When post-quarter private information is positive, managers, at announcement, provide pessimistic guidance and use negative language. This effect is more pronounced when, post-announcement, management insiders trade. We conclude managers do not fully disclose their private information and instead bias their disclosures down when in possession of positive private information. The data suggest they may be motivated in part by subsequent personal stock-trading opportunities.

Introduction

The information asymmetry around earnings announcements has long been near the center of finance and accounting research. At the time of an earnings announcement, managers have information not only about their firm's performance over the last accounting quarter ("within quarter") but also about performance since the quarter's end ("post quarter"). The announced numbers and the accounting disclosures they rely on help remove within-quarter information asymmetries between managers and external market participants. But these accounting disclosures cannot, by definition, eliminate any post-quarter information asymmetries that managers may possess. Additional tools—discretionary accruals included in the accounting disclosures, formal guidance and informal call tone—have therefore evolved wherein managers have the opportunity to convey post-quarter information in the current, rather than the next, quarterly announcement. Are these discretionary tools—whose transmitted content is difficult for shareholders to verify—used in the interests of shareholders, as intended? Might they be used instead against shareholders, in the interests of managers?

This is the question we ask in this paper. We gain some edge in answering it by constructing proxies for managers' within-quarter and post-quarter internal-corporate information around earnings announcements. These proxies are real-time measures of sales activity covering both within- and post-quarter periods, right up until the announcement date, typically 4–6 weeks after quarter end. The proxies are constructed from multiple big-data sources that provide real-time information about consumer sales at US retailers.

To construct our firm-level real-time corporate sales indexes, we estimate the amount of consumer activity at retail stores approximately in real time, utilizing proprietary data sources. An example would be the data we collect from approximately 50 million mobile phones, as well as tablets

and desktops, pertaining to consumer activity at large US retailers.[1] We focus on US retail firms whose main revenue source comes from their own retail stores. Using this underlying information we derive two indexes, one measuring within-quarter sales activity—denoted by WQS—and the other measuring post-quarter activity up until the announcement date—denoted by PQS.

Specifically, for a given firm in a given quarter, WQS and PQS are the growth rates of consumer activity—defined to be a data event associated with consumer intention to visit a particular retail store—by taking the log difference between the number of events aggregated over the given quarter and the quarterly average of the number of events over quarters *t*-1 to *t*-4.

The innovation here is twofold. First, we are capturing firm-specific real-time economic activity that tracks consumer activity. Our information is distinct from that derived from social media (e.g., Chen, De, Hu, and Hwang, 2015). Because it seeks to measure actual consumer activity, rather than derived opinions or sentiment, it is likely more tightly linked to underlying sales fundamentals. Second, because a firm's managers likely have access to up-to-date information on the firm's operations, our WQS and PQS indexes are, at the time of announcement, useful proxies for managers' private information.

We first demonstrate that the WQS index is related to previously-unannounced within-quarter fundamentals. Specifically, we find that WQS significantly predicts current-period revenue growth, announcement surprises and analyst forecast errors. For example, the R^2 from a regression of quarterly revenue growth on WQS is 39%. Also, the average announcement excess return for stocks in the highest quintile of WQS is 2.14%, while that for stocks in the lowest quintile is -1.26%, resulting in an economically significant return differential of 3.4% for the five-day period around earnings

[1] There are many anecdotes that sophisticated investors have increased efforts to achieve an informational edge by analyzing unique data to predict firms' fundamental activities. For example, a UBS analyst was reported to have purchased satellite images of Walmart's parking lots to estimate business activity ahead of the release of quarterly earnings (Ozik and Sadka, 2013).

announcement dates. Our information is therefore strongly correlated with previously unannounced within-quarter sales. These predictions are not really surprising, they merely confirm that our novel information, embedded in both WQS and PQS, is potent.

Next, we focus on PQS. We study its relationship with post-announcement returns, discretionary accruals, announced "guidance" forecasts, conference-call tone, and managers' private discretionary trades in the post-announcement trading window. The organizing concept is what we call the Timely Disclosure Hypothesis, i.e., the notion that managers release through available channels all of their private post-quarter information at announcement. Our first and most important test of this null examines the predictability of post-announcement returns using PQS. If managers disclose all of their private information as measured by PQS, we should observe none. Second, Timely Disclosure implies that PQS is positively related to the announcement return over and above the effects of within-quarter information, including WQS.

The alternative to Timely Disclosure is the hypothesis we call 'Leaning Against the Wind' (LAW). Under this alternative, managers use discretionary channels to understate the private information contained in PQS. That is, managers do not fully disclose their private signal, withholding some of the surprise for the future, and even bias their disclosures downward at announcements. They thereby induce opposite-sign predictable components in announcement and post-announcement returns. Thus, under the LAW alternative, we should find that PQS is: *i*) correlated negatively with the announcement returns, controlling for WQS and other controls; and *ii*) correlated positively with post-announcement returns. In testing the LAW alternative, we also examine whether managers' tendency to bias their disclosures is symmetric.[2] Specifically, we examine whether managers understate both

[2] There is already some evidence in the literature of a related effect, by which managers appear to behave asymmetrically when they fail Timely Disclosure. Specifically, they withhold by delaying bad news and withhold less—more fully announcing—good news. See Kothari, Shu, and Wysocki (2008) and Roychowdhury and Sletten (2012).

good news (i.e., bias disclosures negatively for positive information) and bad news (i.e., bias disclosures positively for negative information) and whether they do so symmetrically.

We also look to the drivers of these results by examining the attributes of the announcements themselves. That is, if returns are reliably related to private information, we should see the same pattern of implied disclosure distortion both indirectly in stock returns and directly in the actual channels of discretionary disclosure themselves. There are three disclosure channels we consider: discretionary accruals; guidance (in this case, managers' "bundled forecasts"); and conference call tone, measured through natural language processing algorithms. If we reject Timely Disclosure in favor of the LAW alternative, these should each, all else equal, be negatively related to PQS. Naturally if we find a positive correlation between the measures of disclosures and PQS, we cannot reject the Timely Disclosure null.

Our results in terms of point estimates and statistical power, however, favor the LAW alternative. First we look at stock returns themselves. We find that PQS strongly positively predicts post-announcement returns. This same conclusion holds using excess announcement returns, which, after the imposition of appropriate controls (e.g., WQS, earnings surprise, etc.), are negatively correlated with PQS. Thus, the basic stock return data show managers understate their post-quarter private information. However, our results on announcement returns show that 'Leaning Against Wind' behavior of managers is asymmetric. The relation between announcement returns and PQS is strongly negative when PQS is positive, while there is no statically significant relation between announcement returns and negative PQS. This suggests that while managers understate good news, they do not understate bad news.

Second, we look at the three direct measures of discretionary disclosure. Do these provide evidence that, independent of that from stock return data, managers don't fully disclose and instead lean against the wind of their private signals?

First, we examine discretionary accruals. The LAW alternative predicts that discretionary accruals appear suppressed when PQS is high—a negative correlation. Our empirical tests do not show a strong relation between discretionary accruals and PQS, therefore we cannot reject Timely Disclosure in favor of the LAW alternative based on accruals.

Second, we ask whether management forecasts or "guidance" issued around earnings announcement dates (often called "bundled" forecasts) reject Timely Disclosure, and, if so, whether they do so in favor of LAW. The evidence here is similar, but considerably stronger: the issuance of pessimistic bundled forecasts is systematically related to PQS. The probability of realized future earnings (or revenue) exceeding bundled forecasts is positively and significantly associated with PQS. As the LAW alternative would predict, managers issue more pessimistic forecasts—in this case, guidance—in the presence of more positive post-quarter sales information.

Finally, we examine managerial tone in announcement conference calls. Specifically, we generate sentiment scores measuring managerial tone from managers' speech using conference call transcripts. Managerial tone is a function of the ratio of the number of positive words relative to the sum of the number of positive and negative words, where the list of positive and negative words is from Loughran and McDonald (2011). Just as with discretionary accruals and bundled forecasts, we test sentiment scores against PQS. As above, we find that call sentiment is significantly and negatively related to PQS. In addition, consistent with managers' asymmetric LAW incentives, the negative relation is concentrated in the subsample of positive PQS. This holds with and without controls alike.

Summarizing thus far, the conclusions we derive about managerial behavior from PQS are the same whether we look to announcement and post-announcement returns or whether we look to direct channels of managerial discretion—discretionary accruals, guidance, and conference-call tone—offered at announcement. With the exception of discretionary accruals, the remaining data sources point toward rejection of Timely Disclosure in favor of the LAW alternative.

The next logical question is why. Why would managers consistently across channels, choose to understate or communicate the opposite of their private information, leading the information withheld to leak out only slowly, post-announcement?

Clearly, if managers at announcement obscure fundamental information for a quarter, they enjoy a transitory informational asymmetry versus analysts and the market. This improves their post-announcement trade opportunities. We note that managers could in principal also induce asymmetries by magnifying—i.e., overstating—their private signals instead of reversing them. However, managers' observed preference—to 'lean against the wind'—is sensible in the presence of insider trading opportunities. That is, managers may wish to *increase* the predictable portion of their company's stock price by understating the private information they have about post-quarter sales. On the contrary, overstating may be a risky choice for managers because it induces possible litigation risk. In any case, we find no evidence consistent with managers' overstating the magnitude of their private signals.

Further, we see that their tendency to lean against the wind, while always at least somewhat present, is asymmetric. We find that understatement is much stronger when managers possess positive private information. This asymmetry is credible if understating bad news prior to insider sales leads to higher litigation risks (Skinner (1994, 1997)).

Is our rejection of Timely Disclosure consistent with insiders' trades after earnings announcements? While there are relatively few such insider trades in our sample, we find that the

negative relation between PQS and announcement return is stronger when insiders subsequently purchase their firms' shares. We also show that the positive predictability of PQS for post-announcement returns is even stronger in the presence of subsequent insider purchases. Our results also show that this relation is driven by instances when PQS is positive. We do not observe any statistical relation of PQS with announcement returns and post-announcement returns, when PQS is negative and insiders subsequently sell. This results is consistent with managers' asymmetric LAW incentives for personal trading purposes.

The rest of this paper is organized as follow. In the next section, we review related literature. Section 2 describes our methodology and real-time sales indexes. Section 3 demonstrates the predictability of WQS for fundamentals as well as announcement returns. In Section 4, we study returns around earnings announcement dates and the information contained in PQS. In Section 5, we examine the mechanisms through which managers can potentially manipulate the market's expectation as well as their post-announcement trades. In Section 6, we provide our concluding remarks.

1. Related Literature

Our paper adds to the literature on managers' asymmetric incentives to disclose good news versus bad news. In general, the literature has shown that bad news tends to be delayed and good news tends to be accelerated. For example, Kothari, Shu, and Wysocki (2008) show that managers delay the release of bad news up to a certain threshold, but release good news immediately. Roychowdhury and Sletten (2012) discuss the earnings reporting process as a mechanism that forces managers to disclose bad news that they otherwise have incentives to withhold. Graham, Harvey, and Rajgopal (2005) document that some CFOs claim that they delay bad news disclosures in the hope that the firm's status will improve. However, there are opposing incentives to release bad news early. For example, Skinner

(1994, 1997) and Baginski, Hassell, and Kimbrough (2002) show that litigation risk can motivate managers to quickly reveal bad news. Contrary to the discussion on bad news disclosure, only a few papers study managerial incentives to delay the disclosure of good news. Yermack (1997) (see also Aboody and Kasznik, 2000) shows that CEOs receive option awards shortly before favorable news, implying a delay of good news. Our paper contributes to the literature, showing that managers' departures from the Timely Disclosure Hypothesis may be sensitive to post-quarter private information held by managers at announcement and that managers may act through their stock trading to benefit from these departures.

This paper also touches on the literature on insider trading. Rogers (2008) shows that managers provide high-quality disclosures before selling shares and low-quality disclosures prior to purchasing them. Piotroski and Roulstone (2005) show that insider trades are positively related to firms' future earnings performance and inversely related to recent returns, indicating that insiders possess superior information and that this information is most valuable when the market has it wrong. Jenter (2005) also finds that top managers act to express contrarian views on firm value. Roychowdhury and Sletten (2012) provide evidence that managers delay the disclosure of bad news when they are net sellers. Our findings are generally consistent with these views, but further show that insiders may be able to manage the market's impression through their announcements in ways that make their private information at announcement more valuable to their personal trading.

Finally, this paper is related to a growing literature that uses textual analysis to understand financial markets (Tetlock (2007), Tetlock, Saar-Tsechansky, and Macskassy (2008), Loughran and McDonald (2011)). Mayew and Venkatachalam (2012) use vocal emotion analysis software to show that managerial vocal cues contain useful information on firms' fundamentals. Chen, De, Hu, and Hwang (2015) study Seeking Alpha, a popular financial blog, and find that positive sentiment predicts earnings announcements and future stock returns. Druz, Petzev, Wagner, and Zeckhauser (2016)

show that conference call tone predict future earnings and uncertainty. Bartov, Faurel, and Mohanram (2015) use the Tweeter feed to extract aggregate sentiment before earnings announcements. Our paper studies the textual tone of managerial conference calls to test whether it conforms to the Timely Disclosure Hypothesis.

2. Methodology and the Main Variable

2.1. Real-Time Corporate Sales Indexes

We construct our real-time indexes of corporate sales, WQS and PQS, to mimic firms' sales systems, using the proprietary outside data sources described below. Figure 1 helps to explain how we construct our main variables to examine the relation between managerial private information and reported earnings. The figure plots the time line around the earnings announcement date for Quarter *t*. The post-quarter period is defined as the time period between the beginning of the fiscal-quarter *t*+1 and the announcement date of quarter-*t* earnings. We denote within-quarter sales information for fiscal quarter *t* as WQS_t, and the sales information for the post-quarter period as PQS_t.

We obtain measures of real-time consumer activity from MKT MEDIASTATS, LLC. The data is collected from various sources, including millions of consumer devices. An example would be a dataset collected from approximately 350 million mobile phones and tablets worldwide, of which approximately 50 million of mobile devices are US based. Among them, approximately 95% are mobile, and 5% are tablets. Another data source provides data from a few million US-based desktops. Although there are surely data points for US firms that can be obtained from non-US devices, we include only data points obtained from US-based devices. The data cover large big-box retailers whose main revenue source comes from their physical retail stores, and does not include e-commerce

businesses or other types of retailers, such as telecommunication companies or restaurants. Consequently, the sample consists of 50 US retail firms.

Table 1 provides the list of firms in the sample, their ticker symbols and US-based revenues as of 2014. 29 of the sample firms are included in the top 100 US retailers by National Retail Federation (NRF). NRF data include private firms, online retailers, restaurants, and telecommunication companies, as well as big-box retailers. The total revenue of sample firms in 2014 is $1.2 trillion, with average (median) firm-level revenue at $24.4 billion ($7.3 billion). The total revenue of our sample firms is about 64% of the total revenue of the NRF 100. The ratio jumps to 77% when we exclude non-pure retailers, such as restaurants and telecommunications, from the list.

Each data source contains billions of individual activities—such as web searches and downloads—by users. For example, the dataset obtained from the cell phones and tablets contains annually more than 3 billion user activities, of which about 400 million activities annually are generated in the US. We search for specific types of events among various activities. Specifically, we focus on an individual event: a consumer's intention to visit or shop at a particular retail store. We identify approximately one million of such individual events for our sample firms per year from multiple sources. These events are counted and aggregated per retailer each week. For example, a search for driving directions to a geographical location of a Walmart store is counted toward Walmart's consumer activity for the week. Other examples of such events are queries concerning store location or coupon downloads.

Some retailers have multiple brand name stores. For example, GAP has several brand name stores, including Gap, Banana Republic, Old Navy, Piperlime, Athleta and INTERMIX. Therefore,

consumer activities for the firm include all the possible combination of those search terms with all the brand names of the firms. Total events for GAP aggregates activities across these brand name stores.

Our real-time sales indexes (WQS and PQS) are derived using weekly consumer activity data described above, aggregated to the firm level. As mentioned above, WQS for a given quarter and firm uses that firm's quarterly growth rate of events over the previous four quarters, taking log differences between the number of events aggregated over the given quarter and the average of the prior four quarters.

PQS is measured in a similar fashion. We aggregate individual events during the post-quarter period and express in full-quarterly units, by multiplying the number of aggregated events by the number of weeks in the quarter and dividing it by the number of weeks in the post-quarter period. PQS is then analogous to, and in the same units as, WQS, i.e., the log difference of the estimated number of events for the quarter and the quarterly average of the number of events aggregated over the previous four quarters.

Figure 2 illustrates an example of one of the data sources on consumer activities that are used to construct our sales indexes. The first and second panels provide daily time series of individual events pertaining to GAP and Target Corporation over the period of Dec. 2012 to Nov. 2013, while the third panel shows the time series of events for a larger sample derived from data extracted from Android mobile devices in the United States. The data are normalized by scaling to the highest value of daily activities during the sample. The figure displays observed patterns that are clearly correlated with consumption. For example, all three panels share a similar pattern, displaying higher levels of activity during holiday seasons and spikes in volume during weekends. The mid-year spike in GAP coincides with their mid-year sale event.

2.2. Variable Definitions and Summary Statistics

We use CRSP to obtain stock market variables, including stock returns, prices, and number of shares outstanding for the firms in our sample. The IBES detail history file is used to obtain analyst forecasts and earnings announcement dates. Financial statements are obtained from Compustat.

Table 2 shows the summary statistics of the main variables. The variables are defined as follows. Quarterly revenue growth is calculated as $S_{i,t}/S_{i,t-1} - 1$, where $S_{i,t}$ is quarterly revenue in fiscal quarter *t* for firm *i*. To estimate standardized unexpected revenue (SUR), we assume that revenue follows a seasonal random walk with a drift. Specifically, SUR for stock *i* in quarter *t* is defined as $[(S_{i,t} - S_{i,t-4}) - r_{i,t}]/\sigma_{i,t}$ where $\sigma_{i,t}$ and $r_{i,t}$ are the standard deviation and average, respectively, of $(S_{i,t} - S_{i,t-4})$ over the preceding eight quarters; standardized unexpected earnings (SUE) is estimated as $(AE_{i,t} - FE_{i,t})/P_{i,t}$, where $AE_{i,t}$ is quarterly earnings per share announced for stock *i* in quarter *t*, $FE_{i,t}$ is the mean of analysts' forecasted EPS, and $P_{i,t}$ is quarter-end price; the announcement return is calculated as the return in excess of the market during the period beginning one day before the earnings announcement date and ending three days after the announcement date; the post-earnings-announcement return (PAR) is the return of each firm in excess of the market for the period beginning four days after the announcement date and ending 60 days after the announcement date.

Panel A reports descriptive statistics of the main variables. WQS has slightly higher average, median, and standard deviation compared to revenue growth. WQS has a mean (median) of 0.034 (0.024) and a standard deviation of 0.316. Revenue growth has a mean (median) of 0.027 (0.015) and a standard deviation of 0.209. Announcement returns for this sample are positive on average, with a mean of 0.7% and a median of 0.3%. The average PAR is also slightly positive at 0.2%, but the median has a negative value of -0.2%.

Panel B reports Pearson correlations (upper right) and Spearman rank correlations (lower left). WQS has significant and positive correlations with revenue growth, SUR, SUE, and the announcement return. The correlation between WQS and PAR is significantly positive at the 10% and 1% levels using Pearson and Spearman, respectively. As expected, revenue growth and SUR have significantly positive correlations with SUE and announcement returns, and positive correlations with PAR, implying that revenue growth and surprises are important sources for SUE and announcement returns, as well as for post-earnings-announcement returns.

3. Prediction using Real-Time Sales Indexes

In this section, we examine the informativeness of real-time corporate sales indexes with respect to firm fundamentals.

3.1. Sales and Earnings

Table 3 demonstrates the predictive power of our corporate sales indexes for revenue growth and surprises. Panel A reports regressions of quarterly revenue growth on quarterly growth of consumer activities, as defined in Section 2. Panel A uses quarterly growth of consumer activities as an independent variable, instead of WQS, to map with the time horizon of the dependent variable, which is current-period revenue growth. Thus, the purpose of the analysis in Panel A is to test whether consumer activity data used to calculate WQS is informative for predicting firm revenue.

Models (1) to (4) show the results of pooled time-series cross-sectional regressions. For Models (2) to (4), we include time (year-quarter) fixed effects, firm fixed effects, and both time and firm fixed effects, respectively. Model (5) shows Fama-MacBeth regression results. Specifically, each quarter, we estimate cross-sectional regressions of revenue growth on the quarterly growth rate of

consumer activities. Then, we calculate the time-series average of the regression coefficients and measure its naïve time-series *t*-value. For Models (1) to (4), we report the adjusted R^2. The average R^2 is reported for Model (5). The sample consists of firm-quarters of US retailers with fiscal quarters ending between March 2009 and July 2014.

Panel A shows that revenue growth is strongly predicted by our consumer sales activity indexes. Model 1 shows an R^2 of 39%. The coefficient is 0.4 (*t*-value of 24), that is, a 1% increase in consumer activity is associated with 0.4% increase in revenue. The results are robust to firm and time fixed effects, and to the Fama-MacBeth specification in Model (5). While the magnitude of the average coefficient in Model (5) is lower at 0.29, the naïve *t*-value is still strongly significant at 8.62 and the average R^2 is 23%. Our indexes undoubtedly include noise, but it is clear that they are strongly correlated with actual revenues and thus may serve as effective proxies.

Figure 3 shows the results of Table 3 graphically. The figure scatter-plots revenue growth on the growth of consumer activities. The vertical axis is the quarterly revenue growth and the horizontal axis is the consumer-activity growth. The red line is the predicted value of revenue growth using consumer activities. As in Table 3, the slope of the fitted line is less than one, so that not all of our measured traffic to stores leads to actual consumption. However, the scatter plot reaffirms a strong correlation.

In Panel B, we study revenue surprises using WQS as the explanatory variable. Specifically, we report results when SUR is projected onto WQS, using the same specifications as in Panel A. The results show that WQS has strong predictability for revenue surprises, robust to firm and time fixed effects. For example, including both time and firm fixed effects (Model 4) yields a coefficient of 0.7 on WQS with a *t*-value of 2.92. The Fama-MacBeth specification provides similar results, implying

that the predictability of WQS is unlikely due to specific periods in time or unobserved firm characteristics.

Next we examine the relation between earnings and WQS. Table 4 shows that WQS predicts earnings, not simply revenue surprises. Model (1) shows the result of a simple regression of SUE on WQS. The coefficient is positive, with a *t*-value of 2.37. Model (2) uses revenue surprises to predict earnings surprises. Jagadeesh and Livnat (2006) show that revenue surprises help explain earnings announcement return and post-announcement drift. Ertimur, Livnat, and Martikainen (2003) study different sources of earnings surprises and find that investors value revenue surprises more highly than expense surprises. Consistent with these studies, we find that SUR is highly correlated with SUE, implying that SUR is an important source of earnings surprises.

Model (3) includes both WQS and SUR on the right-hand side. Although the magnitude of both SUR and WQS become slightly smaller than previous specifications, both variables remain statistically significant. Model (4) controls for lagged SUE to address its persistence (see, e.g., Bernard and Thomas 1989, 1990, Arbarnell and Bernard, 1992). But lagged SUE turns out to be insignificant and its inclusion does not affect the significance of WQS and SUR.

Models (5) to (8) examine whether time-specific effects or firm-specific heterogeneity drive the results. Specifically, we add time and firm fixed effects or use the Fama-MacBeth method. With the exception of the Fama-MacBeth specification, which yields a positive but insignificant WQS coefficient, WQS's ability to predict earnings surprises is robust. For example, Model (7), which projects SUE onto WQS, SUR and time and firm fixed effects, yields a coefficient of 0.172 and a *t*-value of 2. Overall, Table 4 demonstrates that WQS reliably predicts earnings surprises.

3.2. Return Predictability

Next we turn our attention to announcement returns. Table 5 examines WQS's predictions of earnings announcement returns. We use a five-day event window around the announcement, beginning one day prior and ending three days later. Berkman and Troung (2009) document that the proportion of Russell 3000 firms which make after-hours earnings announcements is over 40%. Based on our dating of events, earnings-related price changes for after-hour announcements are observed on day 1, not 0. In addition, forecasts for the following quarter are usually announced within one trading day. We thus use a slightly longer event window to capture the market's complete reaction to the announcement.[3]

Panel A shows the average announcement returns, in excess of the market, during the event window by WQS quintiles. We form WQS quintiles as follows. At each month-end *t*, we rank all sample firms based on their WQS, calculated for their most recent fiscal-quarter, to obtain quintile cutoff values. We then use these values to assign quintile ranks for the firms whose fiscal quarter ends at month-end *t*. We follow this process to make sure that we use the full sample of firms when ranking them. Different methods of assigning quintile scores – for example, in each month *t*, rank firms using only firms that have fiscal quarter end at *t* – do not change our results.

Panel A shows that WQS reliably predicts announcement returns. Average announcement returns are monotonic across quintiles of WQS and the average return for firms in the lowest quintile is -1.26% (with 10% significance), while the average returns of Quintiles 4 and 5 are 1.67% and 2.14%, respectively (both at 1% significance). The last column reports tests of the null hypothesis that the mean difference between the highest and lowest quintiles is zero. This difference is economically significant at 3.40% (five-day holding period) and highly statistically significant (a *t*-value of 3.43).

[3] Choosing different event windows does not alter the inference.

In Panel B, we run regressions of announcement returns on WQS. Models (1) to (4) show the results of pooled regressions, while Model (5) uses Fama-MacBeth regressions. The results here agree with those in Panel A, showing that WQS reliably predicts announcement returns. This conclusion is robust to time, firm and time/firm fixed effects as well as to a Fama-MacBeth specification. For example, in Model (1), the coefficient on WQS is 0.035, with a *t*-value of 3.86. The WQS coefficient magnitudes are very similar across all model specifications, at around 0.035. In terms of economic size, these coefficients imply that a one-standard-deviation increase in WQS predicts an additional 1.1% increase in announcement return.

The informativeness of WQS for announcement excess returns is also apparent in Figure 4. The Figure plots the average buy-and-hold returns for 10 days on either side of the announcement date. The first and second panels report average excess returns for the lowest and highest quintiles, respectively. The return profiles across event windows differ markedly: As expected, there is a statistically significant negative (positive) jump around announcement date for the lowest (highest) quintile.

4. Private Information and Corporate Disclosure

Having demonstrated that WQS contains important information on firm fundamentals, earnings surprises and announcement returns, we feel justified then, in turn, to interpret the post-quarter equivalent to WQS—PQS—as a proxy for managers' private information at announcement and to explore its effects on disclosure.

4.1. Post-Earnings-Announcement Returns and Private Information

Recall that our null hypothesis—that of Timely Disclosure—implies managers release their post-quarter private information at announcement through discretionary channels, so that post-announcement prices incorporate this information. If managers inform market participants of their private information at announcement dates, then post-announcement returns should not be predictable by PQS.

Table 6 begins by reporting regressions of post-announcement returns on PQS, WQS, and various controls. Specifically, we estimate the following model:

$$PAR_{i,t} = \alpha + \beta_1 PQS_{i,t} + \beta_2 WQS_{i,t} + \gamma' \mathbf{X}_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where $PAR_{i,t}$ is the post-announcement excess return for firm *i* and quarter *t*, beginning on the fourth day and ending on the 60th day after the announcement date of fiscal quarter-*t* earnings. $\mathbf{X}_{i,t}$ represents the controls, including SUE, SUR, Size (log market capitalization), BE/ME (log book-to-market ratios for the most recent fiscal year ending at least three months prior to fiscal quarter-*t* end), and PastReturn (cumulative excess return from 30 to 3 days prior to the announcement date).

Model (1) shows that PQS explains a positive and significant fraction of post-announcement return. Model (2) includes WQS individually and reports that it also is positive and significant at the 10% level. However, Model (3) reveals that WQS is subsumed by PQS, while the latter remains statistically significant at the 10% level. Thus, managers' private information during quarter *t*+1 is not fully observed by investors at announcement; at least some is disseminated and reflected more slowly over time in stock prices.

Models (4) to (6) add controls of SUE and SUR, their lags and fixed effects. Bernard and Thomas (1990) and Jagadeesh and Livnat (2006), for example, show that SUE and SUR predict post-

announcement returns. As expected, both SUE and SUR have positive coefficients although they are often insignificant. More important for our purposes, Models (4) to (6) show that the predictability of PQS for post-announcement returns is robust.

Next we partition the sample based on the sign of PQS to investigate the potential for asymmetric disclosures by managers. We define P.PQS (N.PQS), as equal to PQS when PQS is positive (negative) and zero otherwise. P.PQS and N.PQS therefore are proxies, respectively, for positive and negative post-quarter private information.

Models (7) to (9) show the results of regressions using P.PQS and N.PQS. The coefficients of both P.PQS and N.PQS are positive, indicating regardless of sign, managers do not fully disclose their information regarding PQS at announcement. However, Model (9), which includes both time and firm fixed effects, shows the predictability of post-announcement returns is stronger in case for positive PQS. The coefficient of P.PQS is significant at the 10% level and of higher magnitude than that of N.PQS which is statistically insignificant. In Section 5 below, we report that this positive relation of post-announcement returns with positive PQS is particularly strong when insider purchases take place post-announcement (See Panel B of Table 11). This may imply that delayed disclosures of positive information are at least partly due to personal trading motivations.

In general, the results in Table 6 show that regardless of sign, higher PQS predicts higher post-announcement returns, suggesting that managers disclose only part of their private information at announcement and leave the rest to be diffused into the price over time. These results provide an interesting perspective relative to previous studies which discuss asymmetric incentives of managers to disclose good news versus bad news. Some studies show managers withhold bad news while releasing good news quickly (e.g., Kothari, Shu, and Wysocki (2008) and Roychowdhury and Sletten (2012)). Others examine managerial incentives to delay good news for personal benefits, such as stock

option awards (e.g., Yermack (1997) and Aboody and Kasznik (2000)). Our results suggest that managers generally withhold a portion of their private post-quarter information, perhaps a bit more so when the information is positive.

4.2. Announcement Returns and Private Information

To further investigate such apparent withholding of information, we study next whether managers provide biased disclosure at announcement by examining the relation between announcement returns and PQS. Specifically, we report in Table 7 regressions of announcement returns on PQS, WQS, and controls.

First, we comment on the controls' coefficients. Consistent with the literature, Size tends to exert a significantly negative effect. BE/ME has a positive effect, but this is rendered insignificant once SUE and SUR are controlled. PastReturn has a negative effect, albeit often insignificant—announcement returns typically incorporate at least some reversal of past returns (So and Wang, 2014). As expected, SUE and SUR both are positively and significantly related to announcement returns whereas lagged SUE and SUR have negative but insignificant coefficients. Overall, our sample shares similar control characteristics with those reported in other studies.

Next we turn to our main variables, WQS and PQS. As in Table 5, WQS positively predicts announcement returns before and after controls. But, to our surprise, PQS enters with a significantly negative coefficient, suggesting that post-quarter real-time information is not only understated but appears in opposite sign. That is, when the post-quarter is positive (negative), the announcement return is unexpectedly low (high), after controls which include WQS.

Is this negative relationship between announcement return and PQS symmetric with respect to good versus bad underlying signals? The results from Models (6) to (10) suggest that P.PQS is the

overwhelming driver of this overall negative relationship. The coefficient on N.PQS is also negative, but is much smaller and statistically insignificant. Disclosure distortions are therefore asymmetric; while there is a tendency to temper both good and bad news, good news is tempered heavily whereas bad news only slightly and insignificantly.

This negative correlation of announcement returns with positive PQS has several interpretations. One would be litigation risk. Skinner (1994, 1997), for example, suggests that litigation risks discourage optimistic projections by managers. Distorting downward positive information may help avoid lawsuits. Notice, however, that managers may also be exposed to litigation risk if they *overstate* their private information when negative, pushing stock prices temporarily higher. That is, litigation risk is not entirely consistent with our results because it is more likely to be symmetric with respect to disclosure distortions.

Another possible interpretation is that managers may distort positive disclosures downward to reduce their firm's current stock price and thereby increase its expected return. This bestows upon managers private advantages if, for example, they can use the post-announcement window to trade their company's stock. We examine the insider trading rationale further in the next section.

In sum, Table 7 documents the negative relation between PQS and announcement returns, especially when PQS is positive. This result, together with the predictability of PQS for post-announcement returns, suggests that managers may intentionally understate their expectation for the next quarter at the time of earnings announcements. Thus, the expected stock-price return increases as managers' private information is gradually released and reflected in stock prices. This opens up opportunities for managers to take advantage for their personal gain.

5. Accruals, Bundled Forecasts, Managerial Tones, and Insider Trading

The documented patterns in returns around announcement dates and PQS suggest managers' use announcement disclosures to influence the market's views in particular ways. In this section, we look at direct evidence of disclosure distortions to examine if they match those suggested by our indirect tests based on stock prices.

We examine three channels that managers may make use of to affect disclosures: discretionary accruals; management forecasts or guidance; and nuanced tone in conference calls. We also examine how managers' private information, measured using PQS, affects managers' incentives for personal trading.

5.1. Discretionary Accruals

Demski (1998), Subramanyam (1996), and Louis and Robinson (2005) suggest that managers use discretionary accruals to communicate their private information and show that discretionary accruals are positively associated with future profitability or dividend changes. In our context, is there evidence that managers use distortions in discretionary accruals to lower the market's expectation of future earnings?

Each quarter, discretionary accruals (DA) are estimated using an extended Jones (1991) model from a cross-sectional regression as follow (Larcker and Richardson, 2004):[4]

$$TA = \alpha_0 + \alpha_1 (1/A) + \alpha_2 (\Delta REV - \Delta REC) + \alpha_3 PPE + BE/ME + CFO + \varepsilon, \qquad (2)$$

[4] We follow Larcker and Richardson (2004) who extend the modified Jones model by adding the book-to-market ratio and cash flow from operation. Dechow, Sloan, and Sweeney (1995) show that the modified Jones model exhibits the most power in detecting earnings management. However, McNichols (2002) highlights the importance of operating cash flows in accrual estimation. We also measure accruals from the statement of cash flows instead of balance sheet, following Hribar and Collins (2001).

where TA is total accruals scaled by lagged total assets; A is total assets; PPE is current-quarter gross property plant and equipment scaled by prior-quarter total assets; ΔREV is the quarterly change in revenue scaled by prior-quarter total assets; and ΔREC is the quarterly change in net receivables scaled by prior-quarter total assets; BE/ME is the book-to-market ratio; CFO is current-quarter operating cash flow scaled by prior-quarter total assets. Fiscal quarter dummies are also included in the regression. Discretionary accruals (DA) are the residuals from Equation (2), ε.

If managers indeed distort discretionary accruals, we should observe a negative relation between discretionary accruals and PQS. We run the following regression to test this prediction:

$$DA = \alpha + \beta_1 WQS + \beta_2 PQS + \beta_3 SUE + \beta_4 SUR + \varepsilon. \quad (3)$$

Panel A of Table 8 reports the results of Equation (3) across related specifications. Model (1) suggests that WQS is not significantly related to discretionary accruals. This is sensible, because WQS is strongly correlated with revenue growth and earnings growth, which are already accounted for when discretionary accruals are estimated. Model (2) regresses DA on PQS, which enters the model with an insignificant coefficient. Insignificance of PQS is observed across specifications, suggesting that managers do not use discretionary accruals as a channel for distorting PQS.[5]

The only variable that produces a significant coefficient is SUE, suggesting the relationship between discretionary accruals and earnings surprises is positive. This result is not unexpected: firms with strong SUE tend to have strong growth expectations and strong receivables and other elements of working capital. Thus growth expectation may be an unobserved driver that is not driven out by including PQS.

[5] We also use specifications with partitioned PQS, by including positive PQS and negative PQS separately. Since the variables of signed PQS are also insignificant, those results are not reported.

Studies on earnings management have shown that firms have strong incentives to manage earnings to meet and beat a benchmark, such as analysts' earnings forecasts or previous year's reported earnings (Burgstahler and Dichev (1997), Bartov, Givoly, and Hayn (2002), Bhojraj, Hribar, Picconi, and McInnis (2009), and Roychowdhury (2006)). Therefore, in Panel B, we introduce dummy variables that indicate whether firms are on the verge of beating or missing analysts' forecasts, and examine whether managers' incentives for earnings management through discretionary accruals are affected by the likelihood of beating or missing analysts' forecasts.

We follow Bhojraj, Hribar, Picconi, and McInnis (2009) to define three dummy variables—Meet, Beat, and Miss; Meet is a dummy variable that equals one if a firm has earnings that were within plus or minus half-a-cent of the consensus forecast, and zero otherwise; Beat is a dummy variable that equals one if a firm has reported earnings between half-a-cent and one-and-a-half cents above the consensus forecast, and zero otherwise; Miss is a dummy variable that equals one if a firm has reported earnings between half-a-cent and one-and-a-half cents below the consensus forecast, and zero otherwise. We also include interaction terms of these dummy variables with PQS as well in Equation (3).

Panel B shows that Beat is positive and significant, suggesting that firms may use discretionary accruals more aggressively when they are on the verge of beating the benchmark. The coefficients on Miss are negative and significant, suggesting that firms that are unable to beat the benchmark have reduced discretionary accruals.

The more interesting variables may be the interaction terms of the dummies with PQS. If managers use discretionary accruals to manage down the market's expectation, we would observe negative coefficients on the interaction terms. However, we do not find much evidence on whether firms that marginally beat or miss the benchmark use earnings management, upon seeing strong PQS.

Overall, PQS is not strongly related to discretionary accruals; these are therefore not the main source of the dual relationship between PQS and announcement/post-announcement returns.

5.2. Bundled forecasts

Next we turn to potential distortions in earnings and revenue forecasts provided by management. To explore these, we create a sample of management forecasts issued concurrently with earnings announcements (i.e., "bundled" forecasts) and investigate the relation between these forecasts and PQS.[6] If managers issue pessimistically biased forecasts when PQS is strong, the likelihood that ex-post realized earnings exceed management forecasts should be positively related to PQS. We test this prediction using a Probit model.

The dependent variable of our model is a dummy variable equal to one if the management forecast is pessimistic compared to realized earnings (or revenue) and zero otherwise. We assume the management forecast to be pessimistic if the related management forecast error is less than a cutoff value. The management forecasting error for EPS is defined as ($MF_{i,t+1} - A_{i,t+1}$) scaled by $P_{i,t+1}$, where $MF_{i,t+1}$ is the management forecast for quarter *t+1*, and $A_{i,t+1}$ is realized quarterly EPS amount. The forecasting error for revenue is defined as ($MF_{i,t+1} - A_{i,t+1}$) scaled by $MF_{i,t+1}$. We use the cutoff value of -0.002 for earnings (10 cents for a stock of $50) and -0.1% for revenue.[7]

Table 9 reports the results of the Probit regressions. Panel A uses management forecasts of EPS to calculate the dependent variable, while Panel B uses the revenue forecasts of managements.

[6] Approximately 32% of earnings announcements in our sample are bundled with managements' forecast of the next quarter. This ratio is consistent with Rogers and Van Buskirk (2013) who document that about 29% of announcements are bundled for the post-Reg FD period.

[7] Both threshold values are approximately at the 40 percentile of their respective distributions. This number is roughly consistent with Rogers and Van Buskirk (2013) who classify roughly 35% of announcements as negative surprises. Using different threshold values does not change the inference.

We report the average marginal probability change for a one-standard-deviation change in the values of the covariates.

The results show that the likelihood of ex-post earnings or revenue being higher than management forecasts is positively and significantly related to PQS. A one-standard-deviation increase in PQS is associated with about 5% to 8% (7% to 8%) increase in the probability of management forecasts at the time of announcements being ex-post pessimistic relative to realized earnings (revenue).

We also partition the sample based on signs of PQS, by including P.PQS and N.PQS separately. Although the likelihood of firms' realized EPS being higher than their own guidance does not vary much based on the sign of PQS, Panel B shows the likelihood of realized revenue beating the guidance is significantly higher when PQS is positive. These results are consistent with previous tests, showing that managers distort guidance downward when PQS is positive.

In sum, Table 9 provides direct evidence of downward managerial disclosure distortions at announcement when PQS is positive. This direct evidence is consistent with our results about disclosure distortion by observing stock price changes.

5.3. Managerial Tone of Conference Calls

Lastly, we turn to conference call tone and whether it shows similar signs of disclosure distortion. The dependent variable is now TONE, defined as the log of (1 + number of positive words) / (1 + number of positive words + number of negative words). We follow Loughran and McDonald (2011) for the classification of positive and negative words.

Table 10 reports the results of TONE regressed on PQS and control variables. Model (1) shows TONE to be positively related to WQS and negatively to PQS. However, once we control for

SUE and SUR, PQS remains significant while WQS is subsumed. This is consistent with earlier findings—managers' tone (in addition to announcement return and guidance forecasts) is negatively correlated with PQS.

Models (6) to (10) again partition PQS by sign. The results suggest that the negative TONE/PQS correlation is mostly due to P.PQS. Managers therefore distort negatively their tone in possession of good PQS information but only slightly positively when PQS is weak.

Overall, the analyses in Tables 9 and 10 provide evidence that direct disclosures—over which managers have control—mimic the indirect results observed in stock prices—which managers cannot necessarily control. This strengthens the view that stock price movements are not simply about the market's reaction, independent of the direct signals that managers seem to be sending. The evidence from bundled forecasts and conference call tone therefore suggest that managers do indeed use such "soft" sources of disclosure to intentionally manage down stock prices when post-quarter information is positive.

5.4. Insider Trading

We now turn to some evidence around what might incent managers to display the disclosure distortions that we document. Because our results reveal transitory stock price declines at announcement when PQS is positive, intentional understatement of positive information can create attractive near-term opportunities for managers to buy stock.

We conjecture that the negative relation between PQS and announcement returns is stronger when insiders plan to buy their firms' shares subsequently. We also conjecture that the positive predictions of post-announcement returns by PQS are stronger when insiders' purchases take place.

Table 11 examines insiders' trades around earnings announcements. Specifically, we run the following regression:

$$R(t,T) = \alpha + \beta_1 PQS + \beta_2 Buy + \beta_3 Sell + \beta_4 Buy \times PQS + \beta_5 Sell \times PQS + \gamma' \mathbf{X} + \varepsilon, \quad (4)$$

where R(t,T) is the stock return in excess of the market measured over the period that starts at date *t* and ends at date T (date 0 is the earnings announcement date); Buy (Sell) is a dummy equal to one if management team is a net buyer (seller) during the 20 trading day post-announcement period and zero otherwise; and **X** is a set of controls.

There are significantly more insider sales than purchases in our sample. Only 2% of announcements are followed by insider purchases, while approximately 31% of announcements are followed by insider sales. This suggests that insiders typically obtain stocks through stock options and sell those vested stocks due to reasons such as diversification or liquidity.

Panel A uses announcement returns, R(-1,3), as a dependent variable. Negative coefficients on Buy and positive coefficients on Sell indicate that insiders tend to purchase following a negative announcement and sell subsequent to a positive announcement. These results are consistent with the literature that shows insiders are contrarian (Piotroski and Roulstone (2005) and Jenter (2005)).

For our purposes, we focus on the coefficient on the interaction between Buy and PQS, which is robust to time and firm fixed effects. It is statistically significant, consistent with our conjecture that the negative relation between PQS and announcement returns is stronger when insiders subsequently purchase their firms' shares. However, the mirror image—that managers provide positive disclosures prior to selling in possession of negative information—is not supported by the results. The interaction of Sell with PQS is insignificant.

In Models (4) to (6), we further investigate whether there exists asymmetry in managers' trading behaviors. Specifically, we interact Buy and Sell separately with positive and negative PQS. The results show that, once again, the negative relation of PQS with announcement returns is driven by instances in which PQS is positive and insiders buy. All other interaction terms are insignificant, implying there is no perceived bias in disclosures when PQS is negative and/or insiders are selling. This result is consistent with the view that insiders talk down temporarily the price of their firm's stock by understating their positive private information at announcement in the hope of purchasing stock thereafter.

The insignificant interaction term between Sell and PQS deserves comment. Rogers (2008) shows that the disclosures of litigation-conscious managers are of higher quality before selling. Thus, before buying, managers may feel less disciplined by Timely Disclosure. Both the negative coefficient on the interaction term of P.PQS with Buy and the insignificant coefficient on the interaction of N.PQS with Sell therefore seem consistent with the extant literature.

Panel B reports the regression results of post-announcement returns over various holding periods. The first two columns of the panel use R(4,60) as the dependent variable. Neither Buy nor Sell is strongly related with post-announcement returns. However, consistent with our conjecture, the positive predictability of post-announcement returns by P.PQS is particularly strong when insiders' purchases take place. The positive coefficient on the interaction between P.PQS and Buy (Model (2)) shows that the predictability is driven by the cases of positive PQS.

The post-announcement price increases may indicate price pressure due to insider purchases, rather than insiders' superior information with respect to PQS. Therefore, we divide post-announcement returns into two holding periods; R(4,20) and R(21,60). R(4,20) is contemporaneous

return with insider trades, since Buy and Sell are defined from insider trades during the 20-trading-day period following earnings announcement.

The results show that the positive relation of PQS with post-announcement returns when insider purchases take places is not due to price pressures from insiders' trades, reinforcing our conjecture that insiders intentionally understate their expectation at the announcements upon seeing strong post-quarter-end results. The coefficient on the interaction between (positive) PQS and Buy is not significant for the contemporaneous return, R(4,20), while it is significantly positive for R(21,60), suggesting that the price movement is due to slow information release rather than price pressure from insider trades.

Overall, the results in Table 11 are consistent with our conjecture, suggesting that corporate insiders distort downward their discretionary disclosures when they have positive private information and can purchase stock in the post-announcement window.

6. Conclusion

We study the relation between managers' private information and its effects on both discretionary earnings-announcement disclosures and insider trading. To do so, we use data sources that are correlated with real-time corporate sales of retail firms. We develop a firm-level real-time corporate sales index for US retail stores and demonstrate its usefulness in explaining future releases of coincident firm fundamentals and future returns. We show that our within-quarter sales index, WQS, has strong predictive power for revenue surprises, earnings surprises, and excess earnings announcement returns. The announcement return differential between high- and low-WQS firms is 3.40%.

Second, we use PQS as a proxy for managers' private information at announcement and study whether their discretionary disclosures of their private information are distorted. We provide evidence against the Timely Disclosure Hypothesis—managers bias downward their disclosures when they possess positive post-quarter information. Specifically, we show that managers' forecasts and conference call tone are, according to objective measures, unduly pessimistic when managers have positive post-quarter information. These disclosure distortions are reflected in stock prices: our PQS measure is negatively related to announcement returns, but positively related to post-announcement returns, and is particularly so when PQS is positive. These results are stronger in instances where insiders buy in the post-announcement period, suggesting managers are driven at least in part by motivations related to personal trading.

References

Abarbanell, Jeffry S. and Victor L. Bernard, 1992, Tests of Analysts' Overreaction/Underreaction to Earnings Information as an Explanation for Anomalous Stock Price Behavior, *Journal of Finance* 47, 1181-1207.

Aboody, David and Ron Kasznik, 2000, CEO stock option awards and the timing of corporate voluntary disclosures, *Journal of Accounting and Economics* 29, 73-100.

Baginski, Stephen P., John M. Hassell, and Michael D. Kimbrough, 2002, The Effect of Legal Environment on Voluntary Disclosure: Evidence from Management Earnings Forecasts Issued in U.S. and Canadian Markets, *The Accounting Review* 77, 25-50.

Bartov, Eli, Lucile Faurel, and Partha Mohanram, 2015, Can Twitter Help Predict Firm-Level Earnings and Stock Returns?, *Working paper*.

Bartov, Eli, Dan Givoly, and Carla Hayn, 2002, The rewards to meeting or beating earnings expectations, *Journal of Accounting and Economics* 33, 173-204.

Berkman, Henk and Cameron Troung, 2009, Event Day 0? After-Hours Earnings Announcements, *Journal of Accounting Research* 47, 71-103

Bernard, Victor L., and Douglas J. Skinner, 1996, What motivates managers' choice of discretionary accruals?, *Journal of Accounting and Economics* 22, 313-325.

Bernard, Victor L., and Jacob K. Thomas, 1989, Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium?, *Journal of Accounting Research* 27, 1-36.

Bernard, Victor L., and Jacob K. Thomas, 1990, Evidence That Stock Prices Do Not Fully Reflect The Implications of Current Earnings For Future Earnings, *Journal of Accounting and Economics* 13, 305-304.

Bhojraj, Sanjeev, Paul Hribar, Marc Picconi, and John McInnis, 2009, Making Sense of Cents: An Examination of Firms That Marginally Miss or Beat Analyst Forecasts, *Journal of Finance* 64, 2361-2388.

Burgstahler, David and Ilia Dichev, 1997, Earnings management to avoid earnings decreases and losses, *Journal of Accounting and Economics* 24, 99-126.

Chen, Hailiang, Prabuddha De, Yu Hu, and Byoung-Hyoun Hwang, 2015, Wisdom of Crowds: The Value of Stock Opinions Transmitted Through Social Media, *Review of Financial Studies*, forthcoming.

Dechow, Patricia M., Richard G. Sloan, and Amy P. Sweeney, 1995, Detecting Earnings Management, *The Accounting Review* 70, 193-225.

DeFond Mark L. and Chul W. Park, 2001, The Reversal of Abnormal Accruals and the Market Valuation of Earnings Surprises, *The Accounting Review* 76, 375-404.

Demski, Joel S., 1998, Performance measure manipulation, *Contemporary Accounting Research* 15, 261-285.

Druz, Marina, Ivan Petzev, Alexander F. Wagner, and Richard J. Zeckhauser, 2016, Reading Managerial Tone: How Analysts and the Market Respond to Conference Calls, Working paper

Ertimur Yonca, Joshua Livnat, and Minna Martikainen, 2003, Differential Market Reactions to Revenue and Expense Surprises, *Review of Accounting Studies* 8, 185-211

Graham, John R., Campbell R. Harvey, and Shiva Rajgopal, 2005, The economic implications of corporate financial reporting, *Journal of Accounting and Economics* 40, 3-73.

Hribar, Paul and Daniel W. Collins, 2001, Errors in Estimating Accruals: Implications for Empirical Research, *Journal of Accounting Research* 40, 105-134.

Jagadeesh, Narasimhan and Joshua Livnat, 2006, Revenue Surprises and Stock Returns, *Journal of Accounting and Economics* 41, 147-171.

Jagadeesh, Narasimhan and Joshua Livnat, 2006, Post-Earnings-Announcement Drift: The Role of Revenue Surprises, *Financial Analysts Journal* 62, 22-34.

Jenter, Dirk, 2005, Market Timing and Managerial Portfolio Decisions, *Journal of Finance* 60, 1903-1949.

Jones, Jennifer J., 1991, Earnings Management During Import Relief Investigations, *Journal of Accounting Research* 29, 193-228.

Kasanen, Eero, Juha Kinnunen, and Jyrki Niskanen, 1996, Dividend-based earnings management: Empirical evidence from Finland, *Journal of Accounting and Economics* 22, 283-312.

Kothari, S. P., Susan Shu, and Peter D. Wysocki, 2008, Do Managers Withhold Bad News? *Journal of Accounting Research* 47, 241-276.

Larcker, David F. and Scott T. Richardson, 2004, Fees Paid to Audit Firms, Accrual Choices, and Corporate Governance, *Journal of Accounting Research* 42, 625-658.

Loughran, Tim and Bill McDonald, 2011, When is a liability not a liability? Textual analysis, dictionaries, and 10-ks, *Journal of Finance* 66, 35-65.

Louis, Henock and Dahlia Robinson, 2005, Do managers credibly use accruals to signal private information? Evidence from the pricing of discretionary accruals around stock splits, *Journal of Accounting and Economics* 39, 361-380.

Mayew, William J. and Mohan Venkatachalam, 2012, The Power of Voice: Managerial Affective States and Future Firm Performance, *Journal of Finance* 67, 1-43.

McNichols, Maureen F., 2002, The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors: Discussion, *The Accounting Review* 77, 61-69.

Ozik, Gideon and Ronnie Sadka, 2013, Big data and information edge, *Hedge Funds Review* December 2013/January 2014, 32-34.

Piotroski, Joseph D. and Darren T. Roulstone, 2005, Do insider trades reflect both contrarian beliefs and superior knowledge about future cash flow realizations? *Journal of Accounting and Economics* 39, 55-81.

Rogers, Jonathan L., 2008, Disclosure Quality and Management Trading Incentives, *Journal of Accounting Research* 46, 1265-1296.

Rogers, Jonathan L. and Andrew Van Buskirk, 2013, Bundled forecasts in empirical accounting research, *Journal of Accounting and Economic*s 55, 43-65.

Roychowdhury, Sugata, 2006, Earnings management through real activities manipulation, *Journal of Accounting and Economic*s 42, 335-370.

Roychowdhury, Sugata and Ewa Sletten, 2012, Voluntary Disclosure Incentives and Earnings Informativeness, *The Accounting Review* 87, 1679-1708.

Sankar, Mandira Roy and K. R. Subramanyam, 2001, Reporting Discretion and Private Information Communication through Earnings, *Journal of Accounting Research* 39, 365-386.

Skinner, Douglas J., 1994, Why firms voluntarily disclose bad news, *Journal of Accounting Research* 32, 38-60.

Skinner, Douglas J., 1997, Earnings disclosures and stockholder lawsuits, *Journal of Accounting and Economics* 23, 249-282.

So Eric C., and Sean Wang, 2014, News-driven Return Reversals: Liquidity Provision Ahead of Earnings Announcements, *Journal of Financial Economics* 114, 20-35

Subramanyam K.R., 1996, The pricing of discretionary accruals, *Journal of Accounting and Economics* 22, 249-281.

Tetlock, Paul C., 2007, Giving content to investor sentiment: The role of media in the stock market, *Journal of Finance* 62, 1139-1168.

Tetlock, Paul C., Maytal Saar-Tsechansky, and Sofus Macskassy, 2008, More Than Words: Quantifying Language to Measure Firms' Fundamentals, *Journal of Finance* 63, 1437-1467.

Tucker, Jennifer W., and Paul A. Zarowin, 2006, Does Income Smoothing Improve Earnings Informativeness?, *The Accounting Review* 81, 251-270.

Yermack, David, 1997, Good Timing: CEO Stock Option Awards and Company News Announcements, *Journal of Finance* 52, 449-476.

Table 1: Sample Firms

This table provides the list of firms in the sample, their tickers, headquarter locations, and US sales amounts as of 2014. US sales amounts are obtained from National Retail Federations and Yahoo! Finance.

No	Ticker	Name	HQ	US Retail Sales (Million USD)
1	AEO	American Eagle Outfitters, Inc.	Pittsburgh, PA	3,283
2	ANF	Abercrombie & Fitch Co.	New Albany, OH	3,744
3	ANN	Ann Inc.	New York, NY	2,533
4	ASNA	Ascena Retail Group Inc.	Suffern, NY	4,713
5	BBBY	Bed Bath & Beyond Inc.	Union, NJ	11,708
6	BBY	Best Buy Co., Inc.	Richfield, MN	35,957
7	BIG	Big Lots Inc.	Columbus, OH	5,177
8	CASY	Casey's General Stores, Inc.	Ankeny, IA	7,767
9	CHS	Chico's FAS Inc.	Fort Myers, FL	2,675
10	COST	Costco Wholesale Corporation	Issaquah, WA	79,694
11	CVS	CVS Health Corporation	Woonsocket, RI	67,974
12	DDS	Dillard's Inc.	Little Rock, AR	6,490
13	DKS	Dick's Sporting Goods Inc.	Coraopolis, PA	6,811
14	DLTR	Dollar Tree, Inc.	Chesapeake, VA	8,390
15	DSW	DSW Inc.	Columbus, OH	2,496
16	EXPR	Express Inc.	Columbus, OH	2,165
17	FDO	Family Dollar Stores Inc.	Matthews, NC	10,489
18	GES	Guess' Inc.	Los Angeles, CA	2,418
19	GNC	GNC Holdings Inc.	Pittsburgh, PA	2,613
20	GPS	The Gap, Inc.	San Francisco, CA	13,071
21	HD	The Home Depot, Inc.	Atlanta, GA	74,203
22	HTSI	Harris Teeter Supermarkets Inc.	Matthews, NC	4,710
23	JCP	J. C. Penney Company, Inc.	Plano, TX	12,184
24	JOSB	Joseph A. Bank Clothiers, Inc.	Hampstead, MD	3,253
25	JWN	Nordstrom Inc.	Seattle, WA	13,259
26	KORS	Michael Kors Holdings Limited	London, UK	4,371
27	KR	The Kroger Co.	Cincinnati, OH	103,033
28	KSS	Kohl's Corp.	Menomonee Falls, WI	19,023
29	LL	Lumber Liquidators Holdings, Inc.	Toano, VA	1,047
30	LB	L Brands	Columbus, OH	10,303
31	M	Macy's, Inc.	Cincinnati, OH	28,027
32	MW	The Men's Wearhouse, Inc.	Houston, TX	3,253
33	PIR	Pier 1 Imports, Inc.	Fort Worth, TX	1,866
34	RAD	Rite Aid Corporation	Camp Hill, PA	26,528
35	RH	Restoration Hardware Holdings, Inc.	Corte Madera, CA	1,867
36	ROST	Ross Stores Inc.	Pleasanton, CA	11,032
37	SHLD	Sears Holdings Corporation	Hoffman Estates, IL	25,763
38	SIG	Signet Jewelers Limited	Hamilton, Bermuda	5,736
39	SKS	Saks Inc.	New York City, NY	3,148
40	SVU	SUPERVALU Inc.	Eden Prairie, MN	11,499
41	SWY	Safeway Inc.	Pleasanton, CA	36,330
42	TFM	The Fresh Market, Inc.	Greensboro, NC	1,753
43	TGT	Target Corp.	Minneapolis, MN	72,618
44	TIF	Tiffany & Co.	New York, NY	4,250
45	TJX	The TJX Companies, Inc.	Framingham, MA	22,206
46	URBN	Urban Outfitters Inc.	Philadelphia, PA	3,323
47	WBA	Walgreens Boots Alliance, Inc.	Deerfield, IL	72,671
48	WFM	Whole Foods Market, Inc.	Austin, TX	13,642
49	WMT	Wal-Mart Stores Inc.	Bentonville, AR	343,624
50	WSM	Williams-Sonoma Inc.	San Francisco, CA	4,591
			Total	1,219,282
			Average	24,386
			Median	7,289

Table 2: Summary Statistics

Panel A shows the descriptive statistics of main variables, and Panel B reports correlations. The upper right corner of Panel B reports Pearson correlations and the lower left corner of the table provides Spearman correlations. WQS is the real-time corporate sales measured for fiscal quarter *t*. The quarterly revenue growth for firm *i* as of fiscal quarter *t* is calculated as $S_{i,t}/S_{i,t-1}$ minus one, where $S_{i,t}$ is the quarterly revenue as of fiscal quarter *t* for firm *i*. The SUR for stock *i* in quarter *t* is calculated as $[(S_{i,t} - S_{i,t-4}) - r_{i,t}]/\sigma_{i,t}$ where $\sigma_{i,t}$ and $r_{i,t}$ are the standard deviation and average, respectively, of $(S_{i,t} - S_{i,t-4})$ over the preceding eight quarters. The SUE is estimated as $(AE_{i,t} - FE_{i,t}) / P_{i,t}$, where $AE_{i,t}$ is quarterly earnings per share announced for quarter *t* of stock *i*, $FE_{i,t}$ is mean analysts' forecasted EPS, and $P_{i,t}$ is quarter-end price. The announcement return is calculated as the return in excess over the market during the period of one day before the earnings announcement date and three days after the announcement date. The post-earnings-announcement return (PAR) is the return of each firm in excess over the market for the period beginning on 4 days after the announcement dates for fiscal quarter-*t* earnings and ending on 60 days after the announcement dates. p-values of correlations are reported in square brackets.

Panel A: Descriptive Statistics

Variable	WQS	Rev. Growth	SUR	SUE	Ann. Return	PAR
N	918	894	890	869	918	914
Mean	0.0336	0.0271	0.0194	0.0011	0.0066	0.0018
Std Dev	0.3164	0.2091	1.6619	0.0073	0.0887	0.1290
25^{th} Pctl	-0.0960	-0.0723	-0.8717	0.0000	-0.0409	-0.0762
Median	0.0237	0.0148	0.0950	0.0005	0.0028	-0.0017
75^{th} Pctl	0.1675	0.1174	0.9837	0.0016	0.0519	0.0678

Panel B: Correlations

	WQS	Rev. Growth	SUR	SUE	Ann. Return	PAR
WQS		0.628	0.140	0.082	0.127	0.064
		[0.000]	[0.000]	[0.013]	[0.000]	[0.054]
Rev. Growth	0.627		0.232	0.086	0.164	0.051
	[0.000]		[0.000]	[0.010]	[0.000]	[0.131]
SUR	0.137	0.205		0.069	0.175	0.067
	[0.000]	[0.000]		[0.039]	[0.000]	[0.046]
SUE	0.065	0.099	0.235		0.059	0.111
	[0.048]	[0.003]	[0.000]		[0.076]	[0.001]
Ann. Return	0.154	0.164	0.126	0.261		0.066
	[0.000]	[0.000]	[0.000]	[0.000]		[0.046]
PAR	0.091	0.046	0.051	0.054	0.035	
	[0.006]	[0.173]	[0.126]	[0.103]	[0.286]	

Table 3: Revenue growth, SUR, and Real-Time Corporate Sales Index

Panel A shows the regressions of the quarterly revenue growth on the quarterly growth of consumer activities. The quarterly revenue growth for firm *i* as of fiscal quarter *t* is calculated as $S_{i,t}/S_{i,t-1}$ minus one, where $S_{i,t}$ is the quarterly revenue as of fiscal quarter *t* for firm *i*. The quarterly growth of consumer activities is calculated as the log difference between aggregated consumer activities during fiscal quarter *t* and those during fiscal quarter *t*-1. Panel B reports the results of regressions of the standardized unexpected revenue (SUR) on WQS. The SUR for stock *i* in quarter *t* is calculated as $[(S_{i,t} - S_{i,t-4}) - r_{i,t}]/\sigma_{i,t}$ where $\sigma_{i,t}$ and $r_{i,t}$ are the standard deviation and average, respectively, of $(S_{i,t} - S_{i,t-4})$ over the preceding eight quarters. WQS is real-time corporate sales index for fiscal quarter *t*, defined as quarterly growth rate of consumer events over the previous four quarters, taking log differences between the number of events aggregated over quarter *t* and the average of the prior four quarters. Models (1) to (4) show the results of pooled regressions, while Model (5) shows the result of Fama-MacBeth regressions. Adjusted R^2 (for pooled regressions) and the average R^2 (for Fama-MacBeth regressions) are reported. The sample includes firm-quarters of US retailers with fiscal quarter ending between March 2009 and July 2014.

Panel A: Quarterly Revenue Growth on Quarterly Growth of Consumer Activities

Model	(1)	(2)	(3)	(4)	(5)
Coefficient	0.414	0.307	0.417	0.310	0.290
t value	[24.11]	[15.12]	[23.67]	[14.74]	[8.62]
Adj (Average) R^2	39.38%	47.03%	37.07%	44.98%	23.33%
Fixed Effect	N	Time	Firm	Firm+Time	Fama-MacBeth

Panel B: SUR on WQS

Model	(1)	(2)	(3)	(4)	(5)
Coefficient	1.155	0.800	1.128	0.706	0.795
t value	[5.33]	[3.43]	[5.06]	[2.92]	[2.24]
Adj (Average) R^2	2.98%	18.93%	4.11%	21.07%	3.78%
Fixed Effect	N	Time	Firm	Firm+Time	Fama-MacBeth

Table 4: Regression of SUE on WQS

This table reports the regression results of standardized unexpected earnings (SUE) on the within-quarter real-time corporate sales index (WQS). The SUE is estimated as $(AE_{i,t} – FE_{i,t}) /P_{i,t}$, where $AE_{i,t}$ is quarterly earnings per share announced for quarter *t* of stock *i*, $FE_{i,t}$ is mean analysts' forecasted EPS, and $P_{i,t}$ is quarter-end price. Firm quarters with stock prices below $5 are excluded. The SUR for stock *i* in quarter *t* is calculated as $[(S_{i,t} – S_{i,t-4}) – r_{i,t}]/\sigma_{i,t}$ where $\sigma_{i,t}$ and $r_{i,t}$ are the standard deviation and average, respectively, of $(S_{i,t} – S_{i,t-4})$ over the preceding eight quarters. Adjusted R^2 (for pooled regressions) and the average R^2 (for Fama-MacBeth regressions) are reported. The sample includes firm-quarters of US retailers with fiscal quarter ending between March 2009 and July 2014.

Variables\Models	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WQS × 100	0.167		0.148	0.158	0.201	0.180	0.172	0.070
	[2.37]		[2.08]	[2.14]	[2.42]	[2.18]	[2.00]	[1.12]
SUR × 100		0.026	0.021	0.021		0.037	0.043	0.031
		[2.32]	[1.80]	[1.74]		[2.91]	[3.18]	[3.15]
Lagged SUE				-0.013			-0.046	0.346
				[-0.60]			[-2.13]	[2.46]
Adj (Average) R^2	0.53%	0.49%	0.79%	0.75%	11.07%	11.90%	12.38%	33.72%
Fixed Effect	N	N	N	N	Time + Firm	Time + Firm	Time + Firm	Fama-MacBeth

Table 5: Returns Around Earnings Announcement Dates

Panel A shows the average returns during the event window by quintiles of within-quarter real-time corporate sales index (WQS). The event window is the period between one day prior to the earnings announcement date and three days afterward. Returns are calculated in excess of the market returns of the corresponding periods. Quintiles of WQS are calculated using the following process. In month *t*, we pool firms that have fiscal quarter ending during the three-month rolling period of *t-2* to *t*, and rank the firms based on WQS to obtain quintile cutoff values. Then, we use the quintile cutoff values to assign quintile ranks for the firms that have fiscal quarter ending in month *t*. The last row of Panel A reports the results of the hypothesis testing for the mean difference between the highest and the lowest quintiles. Panel B reports the regressions of event returns on WQS. Models (1) to (4) show the results of pooled regressions, while Model (5) shows the results of Fama-MacBeth regressions. Adjusted R^2 (for pooled regressions) and the average R^2 (for Fama-MacBeth regressions) are reported. The sample includes firm-quarters of US retailers with fiscal quarter ending between March 2009 and July 2014.

Panel A: Announcement Returns by WQS Quintile

Quintile	N	Mean	Std Dev	Median	t Value
Low (Short)	161	-1.26%	9.53%	-1.32%	-1.68
2	184	-0.04%	8.51%	-0.21%	-0.06
3	188	0.49%	8.51%	0.90%	0.80
4	205	1.67%	8.82%	0.82%	2.72
High (Long)	180	2.14%	8.76%	1.81%	3.27
HT: High – Low	341	3.40%	9.13%		3.43

Panel B: Regressions of Announcement Returns on WQS

Model	(1)	(2)	(3)	(4)	(5)
Coefficient	0.035	0.035	0.033	0.032	0.033
t value	[3.86]	[3.79]	[2.85]	[2.75]	[2.35]
Adj (Average) R^2	1.49%	2.76%	3.02%	4.34%	4.22%
Fixed Effect	N	Firm	Time	Firm+Time	Fama-MacBeth

Table 6: Post-Earning-Announcement Returns and Real-Time Corporate Sales

This table reports the regression results of the post-earnings-announcement returns on PQS, WQS, and other control variables. The dependent variables are the return of each firm in excess over the market for the period beginning on 4 days after the quarter-*t* earnings announcement dates and ending on 60 days after the announcement dates. The PQS is obtained from the real-time corporate sales index for the period beginning after the fiscal-quarter-*t* end and ending prior to the announcement date for quarter-*t* earnings, and used as a proxy for managements' private information on the fiscal quarter *t+1*. P.PQS equals to PQS when PQS is positive, and zero otherwise. N.PQS equals to PQS if PQS is negative, and zero otherwise. The SUE is estimated as $(AE_{i,t} - FE_{i,t}) / P_{i,t}$, where $AE_{i,t}$ is quarterly earnings per share announced for quarter *t* of stock *i*, $FE_{i,t}$ is mean analysts' forecasted EPS, and $P_{i,t}$ is quarter-end price. The SUR for stock *i* in quarter *t* is calculated as $[(S_{i,t} - S_{i,t-4}) - r_{i,t}]/\sigma_{i,t}$ where $\sigma_{i,t}$ and $r_{i,t}$ are the standard deviation and average, respectively, of $(S_{i,t} - S_{i,t-4})$ over the preceding eight quarters. Size is the natural logarithm of the market capitalization as of fiscal quarter-*t* end. BE/ME is the natural logarithm of the book-to-market ratio as of the most recent fiscal year ending at least three month prior to fiscal quarter-*t* end. PastReturn is the cumulative return in excess over the market from thirty to three days prior to the earnings announcement. The sample includes firm-quarters of US retailers with fiscal quarter ending between March 2009 and July 2014.

Variables\Models	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PQS	0.037		0.033	0.037	0.045	0.053			
	[2.33]		[1.77]	[1.94]	[2.20]	[2.57]			
P.PQS							0.041	0.045	0.060
							[1.44]	[1.48]	[1.87]
N.PQS							0.031	0.045	0.045
							[1.02]	[1.44]	[1.37]
WQS		0.030	0.011	0.006	-0.019	-0.033	0.005	-0.019	-0.031
		[1.75]	[0.50]	[0.25]	[-0.68]	[-1.18]	[0.21]	[-0.68]	[-1.13]
SUE				1.526	1.530	-0.042	1.543	1.530	-0.040
				[1.73]	[1.72]	[-0.05]	[1.74]	[1.71]	[-0.04]
Lagged SUE				-0.726	-0.543	-0.721	-0.723	-0.542	-0.718
				[-1.30]	[-0.96]	[-1.28]	[-1.29]	[-0.96]	[-1.28]
SUR				0.005	0.002	0.002	0.005	0.002	0.002
				[1.49]	[0.49]	[0.57]	[1.49]	[0.49]	[0.56]
Lagged SUR				[-0.01]	-0.005	[-0.00]	-0.006	-0.005	-0.004
				[-2.00]	[-1.36]	[-1.17]	[-2.00]	[-1.36]	[-1.17]
Size	-0.007	-0.005	-0.007	[-0.01]	-0.005	-0.094	-0.007	-0.005	-0.094
	[-1.83]	[-1.45]	[-1.83]	[-1.74]	[-1.27]	[-5.83]	[-1.70]	[-1.26]	[-5.83]
BE/ME	0.017	0.015	0.017	0.015	0.014	0.012	0.015	0.014	0.012
	[2.54]	[2.35]	[2.56]	[2.07]	[1.74]	[0.90]	[2.04]	[1.74]	[0.91]
PastReturn	-0.025	-0.030	-0.027	-0.044	-0.020	-0.090	-0.044	-0.020	-0.090
	[-0.50]	[-0.61]	[-0.52]	[-0.83]	[-0.36]	[-1.65]	[-0.82]	[-0.36]	[-1.65]
Adj R^2	1.75%	0.98%	1.66%	2.50%	7.85%	13.08%	2.38%	7.72%	12.94%
Fixed Effect	N	N	N	N	Time	Time + Firm	N	Time	Time+Firm

Table 7: Announcement Returns and Real-Time Corporate Sales

This table reports the regression results of announcement returns on PQS, WQS, and other control variables. The dependent variable is the returns around announcement dates for fiscal quarter-*t* earnings. The announcement return is calculated as the return in excess over the market during the period of one day before the earnings announcement date and three days after the announcement date. The PQS is obtained from the real-time corporate sales index for the period beginning after the fiscal-quarter-*t* end and ending prior to the announcement date for quarter-*t* earnings, and used as a proxy for managements' private information on the fiscal quarter *t+1.* P.PQS equals to PQS when PQS is positive, and zero otherwise. N.PQS equals to PQS if PQS is negative, and zero otherwise. The SUE is estimated as $(AE_{i,t} - FE_{i,t}) / P_{i,t}$, where $AE_{i,t}$ is quarterly earnings per share announced for quarter *t* of stock i, $FE_{i,t}$ is mean analysts' forecasted EPS, and $P_{i,t}$ is quarter-end price. The SUR for stock *i* in quarter *t* is calculated as $[(S_{i,t} - S_{i,t-4}) - r_{i,t}]/\sigma_{i,t}$ where $\sigma_{i,t}$ and $r_{i,t}$ are the standard deviation and average, respectively, of $(S_{i,t} - S_{i,t-4})$ over the preceding eight quarters. Size is the natural logarithm of the market capitalization as of fiscal quarter-*t* end. BE/ME is the natural logarithm of the book-to-market ratio as of the most recent fiscal year ending at least three month prior to fiscal quarter-*t* end. PastReturn is the cumulative return in excess over the market from thirty to three days prior to the earnings announcement. The sample includes firm-quarters of US retailers with fiscal quarter ending between March 2009 and July 2014.

Variables\Models	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PQS	-0.041	-0.041	-0.041	-0.027	-0.021					
	[-3.41]	[-3.35]	[-3.62]	[-2.15]	[-1.63]					
P.PQS						-0.063	-0.065	-0.054	-0.035	-0.034
						[-3.42]	[-3.46]	[-3.11]	[-1.85]	[-1.71]
N.PQS						-0.017	-0.015	-0.028	-0.019	-0.009
						[-0.87]	[-0.75]	[-1.50]	[-0.99]	[-0.45]
WQS	0.073	0.078	0.055	0.046	0.048	0.076	0.081	0.058	0.047	0.052
	[5.16]	[5.23]	[3.96]	[2.74]	[2.77]	[5.42]	[5.47]	[4.18]	[2.79]	[2.98]
SUE			5.494	5.314	5.455			5.440	5.288	5.436
			[10.32]	[9.68]	[9.24]			[10.19]	[9.59]	[9.20]
Lagged SUE		-0.612	-0.578	-0.530	-0.233		-0.620	-0.583	-0.534	-0.234
		[-1.67]	[-1.71]	[-1.52]	[-0.66]		[-1.69]	[-1.72]	[-1.53]	[-0.66]
SUR			[0.01]	0.009	[0.01]			0.007	0.009	0.008
			[3.58]	[3.91]	[3.49]			[3.63]	[3.91]	[3.48]
Lagged SUR		0.000	[-0.00]	-0.002	[-0.00]		0.000	-0.002	-0.002	-0.002
		[0.12]	[-1.21]	[-0.70]	[-0.93]		[0.15]	[-1.22]	[-0.72]	[-0.95]
Size	-0.008	[-0.01]	[-0.01]	-0.005	-0.034	-0.008	-0.008	-0.006	-0.005	-0.034
	[-3.19]	[-2.94]	[-2.22]	[-1.90]	[-3.36]	[-3.35]	[-3.12]	[-2.33]	[-1.96]	[-3.35]
BE/ME	0.009	[0.01]	[0.00]	0.007	0.008	0.009	0.012	0.003	0.007	0.008
	[2.05]	[2.39]	[0.49]	[1.39]	[0.99]	[2.17]	[2.52]	[0.58]	[1.43]	[1.01]
PastReturn	-0.028	[-0.04]	[-0.04]	-0.050	-0.071	-0.028	-0.038	-0.043	-0.050	-0.070
	[-0.84]	[-1.10]	[-1.36]	[-1.49]	[-2.06]	[-0.84]	[-1.10]	[-1.35]	[-1.49]	[-2.05]
Adj R^2	4.99%	5.16%	19.41%	20.33%	21.74%	5.16%	5.38%	19.40%	20.25%	21.81%
Fixed Effect	N	N	N	Time	Time+Firm	N	N	N	Time	Time+Firm

Table 8: Regressions of Discretionary Accruals

This table examines managers' private information and discretionary accruals. Each quarter, discretionary accruals are estimated from the modified Jones model that includes book-to-market ratio and cash flow from operation (Lacker and Richardson, 2004), using a cross-sectional regression. Meet is a dummy variable that takes one if a firm has earnings that were within plus or minus half-a-cent of the consensus forecast, and zero otherwise. Beat is a dummy variable that takes one if a firm has reported earnings between half-a-cent and one-and-a-half cents above the consensus forecast, and zero otherwise. Miss is a dummy variable that takes one if a firm has reported earnings between half-a-cent and one-and-a-half cents below the consensus forecast, and zero otherwise. The PQS is obtained from the real-time corporate sales index for the period beginning after the fiscal-quarter-*t* end and ending prior to the announcement date for quarter-*t* earnings, and used as a proxy for managements' private information on the revenue of the fiscal quarter *t+1*. The SUE is estimated as $(AE_{i,t} - FE_{i,t}) / P_{i,t}$, where $AE_{i,t}$ is quarterly earnings per share announced for quarter *t* of stock i, $FE_{i,t}$ is mean analysts' forecasted EPS, and $P_{i,t}$ is quarter-end price. The SUR for stock *i* in quarter *t* is calculated as $[(S_{i,t} - S_{i,t-4}) - r_{i,t}]/\sigma_{i,t}$ where $\sigma_{i,t}$ and $r_{i,t}$ are the standard deviation and average, respectively, of $(S_{i,t} - S_{i,t-4})$ over the preceding eight quarters. The sample includes firm-quarters of US retailers with fiscal quarter ending between March 2009 and July 2014.

Panel A: Regressions on PQS

Variables\Models	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PQS		0.000	-0.001	-0.001	-0.001	-0.002	-0.002
		[-0.02]	[-0.61]	[-0.61]	[-0.62]	[-0.64]	[-0.59]
WQS	0.002		0.003	0.002	0.002	0.004	0.006
	[0.93]		[1.20]	[0.61]	[0.59]	[1.09]	[1.74]
SUE				0.314	0.307	0.331	0.338
				[3.24]	[3.16]	[3.23]	[3.13]
Lagged SUE					-0.065		
					[-1.05]		
SUR				0.000	0.000	0.001	0.000
				[1.18]	[1.21]	[1.45]	[-0.43]
Lagged SUR					0.000		
					[0.01]		
Adj R^2	-0.15%	-0.02%	-0.08%	1.62%	1.49%	0.22%	14.41%
Fixed Effect	N	N	N	N	N	Time	Time + Firm

Panel B: Regressions on the Beat, Meet, and Miss Dummies

Variables\Models	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PQS	-0.002	-0.001	0.000	-0.001	-0.001	-0.001	-0.001
	[-0.87]	[-0.60]	[-0.19]	[-0.42]	[-0.43]	[-0.48]	[-0.47]
WQS	0.003	0.003	0.003	0.003	0.001	0.003	0.006
	[1.06]	[1.21]	[1.24]	[1.12]	[0.50]	[0.86]	[1.65]
Beat	0.003			0.003	0.003	0.004	0.002
	[1.96]			[1.82]	[1.98]	[2.14]	[1.13]
Meet		0.001		0.001	0.001	0.001	-0.001
		[0.38]		[0.44]	[0.49]	[0.59]	[-0.32]
Miss			-0.005	-0.004	-0.004	-0.004	-0.006
			[-1.81]	[-1.61]	[-1.51]	[-1.64]	[-2.29]
Beat × PQS	0.008			0.007	0.007	0.008	0.005
	[1.27]			[1.08]	[1.11]	[1.19]	[0.81]
Meet × PQS		-0.001		-0.001	0.000	0.000	0.002
		[-0.10]		[-0.12]	[-0.01]	[-0.02]	[0.28]
Miss × PQS			-0.017	-0.016	-0.016	-0.014	-0.011
			[-1.74]	[-1.65]	[-1.69]	[-1.39]	[-1.14]
SUE					0.315	0.338	0.334
					[3.24]	[3.31]	[3.09]
SUR					0.000	0.001	0.000
					[1.22]	[1.43]	[-0.32]
Adj R^2	0.42%	-0.35%	0.84%	0.92%	2.73%	1.45%	15.21%
Fixed Effect	N	N	N	N	N	Time	Time + Firm

Table 9: Bundled Management Forecasts

This table investigates the relation between managements' forecasts issued around earnings announcement dates and their private information. The dependent variable is a dummy variable equal to one if the management forecast is pessimistic compared to realized earnings (or realized revenue) and zero otherwise. We assume that management forecasts are pessimistic if the related management forecast errors are less than a cutoff value. The management forecasting error is defined as ($MF_{i,t+1} - A_{i,t+1}$) divided by $P_{i,t+1}$ (or $MF_{i,t+1}$), where $MF_{i,t+1}$ is the management forecast for quarterly EPS (or quarterly revenue), and $A_{i,t+1}$ is realized quarterly EPS (or quarterly revenue). The management forecasting error is normalized by $P_{i,t+1}$ for EPS forecast and by $MF_{i,t+1}$ for revenue forecast. Panel A analyzes management forecasts for EPS, while Panel B uses revenue forecasts of managements. The PQS is obtained from the real-time corporate sales index for the period beginning after the fiscal-quarter-*t* end and ending prior to the announcement date for quarter-*t* earnings, and used as a proxy for managements' private information on the fiscal quarter *t+1*. P.PQS equals to PQS when PQS is positive, and zero otherwise. N.PQS equals to PQS if PQS is negative, and zero otherwise. The SUE is estimated as ($AE_{i,t} - FE_{i,t}$) /$P_{i,t}$, where $AE_{i,t}$ is quarterly earnings per share announced for quarter *t* of stock i, $FE_{i,t}$ is mean analysts' forecasted EPS, and $P_{i,t}$ is quarter-end price. The SUR for stock *i* in quarter *t* is calculated as $[(S_{i,t} - S_{i,t-4}) - r_{i,t}]/\sigma_{i,t}$ where $\sigma_{i,t}$ and $r_{i,t}$ are the standard deviation and average, respectively, of ($S_{i,t} - S_{i,t-4}$) over the preceding eight quarters. Panel B uses analysts' forecast errors for revenue, AFE, as an explanatory variable. AFE is computed as ($AR_{i,t} - FR_{i,t}$) /$FR_{i,t}$, where $AR_{i,t}$ is quarterly sales amount announced for quarter *t* of stock i, and $FR_{i,t}$ is mean analysts' forecast for quarterly sales. Size is the natural logarithm of the market capitalization as of fiscal quarter-*t* end. BE/ME is the natural logarithm of the book-to-market ratio as of the most recent fiscal year ending at least three month prior to fiscal quarter-*t* end. Return(4,60) is the cumulative return in excess over the market for the period between four days and 60 days post the earnings announcement. We report the marginal probability change that is obtained by multiplying the average marginal effect of individual observations with a one-standard deviation change in the values of the covariates. Pseudo R^2 based on McFadden's method are reported. The sample consists of the firm-quarters of companies which provided management forecasts on or within three days after the earnings announcement dates.

Panel A: Management Forecasts on Earnings

Model	(1)		(2)		(3)		(4)		(5)		(6)	
Variable	Coefficient	Marg. Prob	Coefficient	Marg. Prob	Coefficient	Marg. Prob	Coefficient	Marg. Prob	Coefficient	Marg. Prob	Coefficient	Marg. Prob
PQS	0.667	6.55%	0.814	7.63%	0.746	6.66%						
	[2.30]		[2.31]		[2.09]							
P.PQS							0.587	3.93%	0.722	4.81%	0.545	3.46%
							[1.36]		[1.50]		[1.11]	
N.PQS							0.789	4.35%	0.867	4.75%	0.961	5.02%
							[1.37]		[1.44]		[1.54]	
SUE×100	3.329	16.70%	3.306	16.41%	3.010	14.26%	3.340	16.75%	3.297	16.44%	3.003	14.29%
	[5.16]		[5.03]		[4.32]		[5.16]		[5.01]		[4.31]	
SUR			0.077	3.93%	0.095	4.67%			0.074	3.92%	0.092	4.62%
			[1.47]		[1.76]				[1.43]		[1.70]	
WQS			-0.422	-2.66%	-0.398	-2.37%			-0.347	-2.62%	-0.315	-2.27%
			[-0.96]		[-0.89]				[-0.79]		[-0.70]	
Size					-0.223	-9.80%					-0.228	-9.98%
					[-3.20]						[-3.24]	
BE/ME					-0.234	-4.40%					-0.232	-4.37%
					[-1.63]						[-1.61]	
Pseudo R^2	8.93%		9.60%		12.75%		8.94%		9.54%		12.75%	

Panel B: Management Forecasts on Revenue

Model	(1)		(2)		(3)		(4)		(5)		(6)	
Variable	Coefficient	Marg. Prob	Coefficient	Marg. Prob	Coefficient	Marg. Prob	Coefficient	Marg. Prob	Coefficient	Marg. Prob	Coefficient	Marg. Prob
PQS	0.998	7.30%	1.127	8.47%	1.050	7.91%						
	[2.08]		[1.97]		[1.80]							
P.PQS							1.349	6.48%	1.339	6.46%	1.386	6.63%
							[1.71]		[1.62]		[1.65]	
N.PQS							0.563	2.30%	0.885	3.62%	0.656	2.66%
							[0.62]		[0.87]		[0.64]	
AFE	22.114	18.25%	20.457	16.94%	20.673	17.00%	22.231	18.31%	20.606	17.02%	20.897	17.10%
	[4.38]		[3.81]		[3.80]		[4.39]		[3.83]		[3.83]	
SUE×100			0.298	1.62%	0.692	3.76%			0.275	1.52%	0.672	3.69%
			[0.43]		[0.84]				[0.39]		[0.81]	
WQS			-0.132	-1.25%	-0.105	-1.17%			-0.168	-1.11%	-0.145	-0.94%
			[-0.22]		[-0.17]				[-0.27]		[-0.23]	
Size					0.058	2.32%					0.059	2.34%
					[0.56]						[0.56]	
BE/ME					-0.213	-4.50%					-0.224	-4.70%
					[-1.24]						[-1.29]	
Pseudo R^2	10.04%		9.74%		10.64%		10.16%		9.80%		10.77%	

Table 10: Managerial Tones in Conference Calls

This table investigates the relation between the managerial tone in conference call transcripts and their private information. The dependent variable is TONE, defined as log (1 + number of positive words) minus log (1 + number of positive words + number of negative words). We use the list of positive and negative words from Loughran and McDonald (2011). The PQS is obtained from the real-time corporate sales for the period beginning after the fiscal-quarter-*t* end and ending prior to the announcement date for quarter-*t* earnings, and used as a proxy for managements' private information on the revenue for the fiscal quarter *t+1*. P.PQS equals to PQS when PQS is positive, and zero otherwise. N.PQS equals to PQS if PQS is negative, and zero otherwise. The SUE is estimated as $(AE_{i,t} - FE_{i,t}) / P_{i,t}$, where $AE_{i,t}$ is quarterly earnings per share announced for quarter *t* of stock i, $FE_{i,t}$ is mean analysts' forecasted EPS, and $P_{i,t}$ is quarter-end price. The SUR for stock *i* in quarter *t* is calculated as $[(S_{i,t} - S_{i,t-4}) - r_{i,t}]/\sigma_{i,t}$ where $\sigma_{i,t}$ and $r_{i,t}$ are the standard deviation and average, respectively, of $(S_{i,t} - S_{i,t-4})$ over the preceding eight quarters. Size is the natural logarithm of the market capitalization as of fiscal quarter-*t* end. BE/ME is the natural logarithm of the book-to-market ratio as of the most recent fiscal year ending at least three month prior to fiscal quarter-*t* end. PastReturn is the cumulative return in excess over the market from thirty to three days prior to the earnings announcement. The sample includes firm-quarters of US retailers with fiscal quarter ending between March 2009 and July 2014.

Variables\Models	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PQS	-0.050	-0.053	-0.055	-0.055	-0.042					
	[-1.92]	[-2.05]	[-2.05]	[-2.86]	[-1.98]					
P.PQS						-0.079	-0.056	-0.067	-0.073	-0.062
						[-1.77]	[-1.28]	[-1.47]	[-2.13]	[-1.67]
N.PQS						-0.023	-0.048	-0.043	-0.038	-0.026
						[-0.55]	[-1.19]	[-1.01]	[-1.15]	[-0.77]
WQS	0.072	0.040	0.038	0.028	0.013	0.071	0.038	0.037	0.030	0.017
	[2.22]	[1.20]	[1.08]	[1.16]	[0.45]	[2.20]	[1.15]	[1.05]	[1.22]	[0.58]
SUE		0.180	0.610	0.341	0.666		0.154	0.568	0.285	0.633
		[0.16]	[0.51]	[0.37]	[0.70]		[0.14]	[0.47]	[0.31]	[0.67]
Lagged SUE			-1.017	-0.123	0.144			-1.019	-0.140	0.130
			[-1.15]	[-0.18]	[0.21]			[-1.15]	[-0.20]	[0.19]
SUR		0.015	0.013	0.008	0.008		0.015	0.014	0.008	0.008
		[4.38]	[3.39]	[2.47]	[2.39]		[4.42]	[3.43]	[2.51]	[2.40]
Lagged SUR			0.005	0.000	-0.005			0.005	0.000	-0.005
			[1.29]	[-0.14]	[-1.37]			[1.30]	[-0.13]	[-1.40]
Accruals			0.105	0.569	0.616			0.098	0.560	0.601
			[0.25]	[1.77]	[1.95]			[0.24]	[1.74]	[1.90]
Size		0.025	0.026	0.048	0.015		0.025	0.026	0.048	0.015
		[5.19]	[5.21]	[2.90]	[0.78]		[5.08]	[5.07]	[2.86]	[0.78]
BE/ME		-0.030	-0.034	0.013	0.028		-0.030	-0.034	0.014	0.028
		[-2.67]	[-2.96]	[0.98]	[1.68]		[-2.65]	[-2.93]	[1.01]	[1.70]
Past Return		-0.034	-0.053	-0.026	-0.014		-0.034	-0.052	-0.024	-0.010
		[-0.54]	[-0.80]	[-0.50]	[-0.26]		[-0.53]	[-0.78]	[-0.46]	[-0.20]
Adj R^2	0.75%	10.05%	10.84%	58.18%	61.04%	0.61%	9.85%	10.64%	58.13%	60.99%
Fixed Effect	N	N	N	Firm	Time + Firm	N	N	N	Firm	Time+Firm

Table 11: Insider Trading Around Earnings Announcements

This table investigates the insiders' trading activities around earnings announcements and the private information. Panel A shows the regression results of the announcement returns on insider trading variables and their interaction terms with PQS. Panel B reports the regression results of post-earnings announcement returns over various holding periods. The PQS is obtained from the real-time corporate sales index for the period beginning after the fiscal-quarter-*t* end and ending prior to the announcement date for quarter-*t* earnings, and used as a proxy for managements' private information on the revenue of the fiscal quarter *t+1*. P.PQS equals to PQS when PQS is positive, and zero otherwise. N.PQS equals to PQS if PQS is negative, and zero otherwise. Buy is an indicator variable that equals one if management team is a net buyer during the 20 trading day period following earnings announcement, and zero otherwise. Sell is an indicator variable that equals one if management team is a net seller, and zero otherwise. The SUE is estimated as $(AE_{i,t} - FE_{i,t}) / P_{i,t}$, where $AE_{i,t}$ is quarterly earnings per share announced for quarter *t* of stock i, $FE_{i,t}$ is mean analysts' forecasted EPS, and $P_{i,t}$ is quarter-end price. The SUR for stock *i* in quarter *t* is calculated as $[(S_{i,t} - S_{i,t-4}) - r_{i,t}]/\sigma_{i,t}$ where $\sigma_{i,t}$ and $r_{i,t}$ are the standard deviation and average, respectively, of $(S_{i,t} - S_{i,t-4})$ over the preceding eight quarters. The DA is discretionary accrual estimated using the modified Jones model, by estimating a cross-section regression each quarter. Size is the natural logarithm of the market capitalization as of fiscal quarter-*t* end. BE/ME is the natural logarithm of the book-to-market ratio as of the most recent fiscal year ending at least three month prior to fiscal quarter-*t* end. PastReturn is the cumulative return in excess over the market from thirty to three days prior to the earnings announcement. Standard errors are clustered at firm level. The sample includes firm-quarters of US retailers with fiscal quarter ending between March 2009 and July 2014.

Panel A: Regressions of Announcement Returns

Variables\Models	(1)	(2)	(3)	(4)	(5)	(6)
WQS	0.050	0.047	0.053	0.049	0.045	0.052
	[3.13]	[2.42]	[2.81]	[3.09]	[2.33]	[2.73]
PQS	-0.040	-0.023	-0.020	-0.040	-0.022	-0.019
	[-2.61]	[-1.33]	[-1.16]	[-2.59]	[-1.32]	[-1.13]
Buy	-0.027	-0.032	-0.038	-0.003	-0.004	-0.014
	[-1.23]	[-1.46]	[-1.78]	[-0.09]	[-0.12]	[-0.45]
Sell	0.020	0.020	0.029	0.021	0.019	0.027
	[2.97]	[2.85]	[4.02]	[2.37]	[2.16]	[2.92]
Buy × PQS	-0.260	-0.274	-0.242			
	[-2.10]	[-2.19]	[-1.92]			
Sell × PQS	0.014	0.003	0.008			
	[0.57]	[0.12]	[0.31]			
Buy × P.PQS				-0.453	-0.499	-0.435
				[-1.91]	[-2.10]	[-1.85]
Buy × N.PQS				-0.091	-0.074	-0.065
				[-0.42]	[-0.33]	[-0.29]
SELL × P.PQS				0.013	0.005	0.016
				[0.35]	[0.14]	[0.43]
SELL × N.PQS				0.015	0.000	-0.002
				[0.40]	[0.01]	[-0.06]
DA	0.217	0.212	0.187	0.217	0.210	0.186
	[1.00]	[0.97]	[0.80]	[0.99]	[0.96]	[0.80]
SUE	5.296	5.021	5.380	5.307	5.041	5.370
	[9.64]	[8.80]	[9.02]	[9.65]	[8.82]	[8.99]
SUR	0.005	0.007	0.006	0.005	0.007	0.007
	[2.55]	[3.13]	[2.76]	[2.58]	[3.16]	[2.79]
Size	-0.005	-0.004	-0.045	-0.005	-0.004	-0.045
	[-1.99]	[-1.60]	[-4.20]	[-1.99]	[-1.60]	[-4.25]
BE/ME	0.004	0.010	0.005	0.004	0.009	0.005
	[0.87]	[1.75]	[0.56]	[0.83]	[1.70]	[0.56]
PastReturn	-0.044	-0.037	-0.068	-0.044	-0.038	-0.069
	[-1.28]	[-1.05]	[-1.94]	[-1.30]	[-1.07]	[-1.95]
Adj R^2	20.96%	21.92%	26.78%	20.83%	21.83%	26.64%
Fixed Effect	N	Time	Time + Firm	N	Time	Time + Firm

Panel B: Regressions of Post-Earnings-Announcement Returns

Dependent Var	Ret(4,60)		Ret(4,20)		Ret(21,60)	
Variables\Models	(1)	(2)	(1)	(2)	(1)	(2)
WQS	-0.020	-0.020	-0.012	-0.012	-0.005	-0.004
	[-0.59]	[-0.60]	[-0.70]	[-0.76]	[-0.19]	[-0.14]
PQS	0.041	0.040	0.007	0.007	0.033	0.032
	[1.37]	[1.38]	[0.56]	[0.58]	[1.07]	[1.06]
Buy	0.012	-0.041	0.029	0.026	-0.022	-0.062
	[0.33]	[-0.66]	[2.22]	[0.98]	[-0.82]	[-1.62]
Sell	-0.010	-0.019	0.002	-0.004	-0.009	-0.011
	[-0.86]	[-1.33]	[0.38]	[-0.55]	[-0.92]	[-0.93]
Buy × PQS	0.335		-0.038		0.279	
	[2.28]		[-0.57]		[2.05]	
Sell × PQS	0.016		0.024		-0.011	
	[0.49]		[1.72]		[-0.34]	
Buy × P.PQS		0.778		-0.006		0.607
		[2.70]		[-0.05]		[3.42]
Buy × N.PQS		-0.047		-0.057		-0.012
		[-0.18]		[-0.31]		[-0.07]
SELL × P.PQS		0.066		0.052		0.004
		[1.47]		[2.19]		[0.10]
SELL × N.PQS		-0.037		-0.007		-0.025
		[-0.78]		[-0.32]		[-0.58]
DA	0.663	0.677	0.379	0.383	0.269	0.275
	[1.37]	[1.38]	[2.04]	[2.05]	[0.61]	[0.61]
SUE	-0.558	-0.585	0.435	0.415	-1.166	-1.169
	[-0.54]	[-0.57]	[0.86]	[0.82]	[-1.21]	[-1.22]
SUR	0.001	0.001	0.002	0.002	-0.001	-0.001
	[0.22]	[0.25]	[1.32]	[1.37]	[-0.22]	[-0.23]
Size	-0.111	-0.111	-0.029	-0.030	-0.076	-0.075
	[-4.78]	[-4.83]	[-3.92]	[-3.87]	[-4.08]	[-4.09]
BE/ME	-0.006	-0.007	-0.002	-0.002	-0.009	-0.009
	[-0.46]	[-0.49]	[-0.29]	[-0.32]	[-0.68]	[-0.70]
PastReturn	-0.100	-0.100	-0.041	-0.041	-0.027	-0.026
	[-1.33]	[-1.34]	[-1.74]	[-1.75]	[-0.39]	[-0.38]
Adj R^2	16.49%	16.56%	7.89%	7.84%	14.44%	14.32%
Fixed Effect	Time + Firm	Time + Firm	Time + Firm	Time + Firm	Time + Firm	Time + Firm

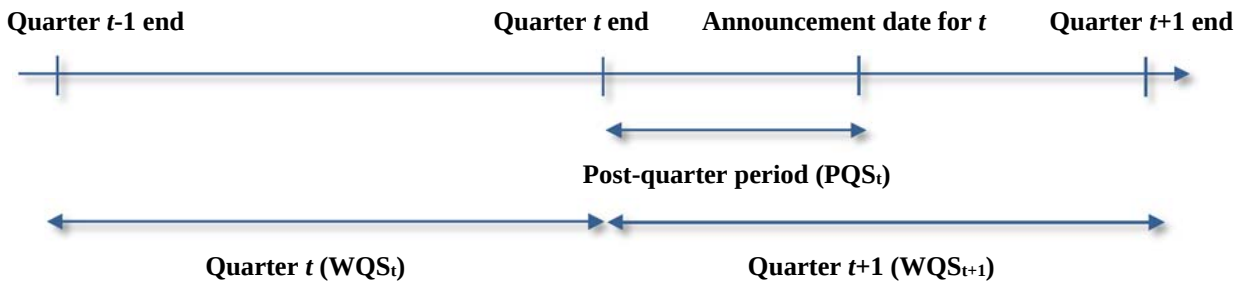

Figure 1 Time periods around earnings announcements and real-time corporate sales. The figure plots the time line around quarterly earnings announcements and describes the time periods for which real-time corporate sales indexes are measured. WQS is within-quarter measure of the index, while PQS is the measure for the post-quarter period. The post-quarter period is defined as the time period beginning the fiscal-quarter *t+1* and ending prior to the announcement date for quarter-*t* earnings.

Figure 2. Daily time-series of consumer activities obtained from Android device. The figure plots one of the data sources that are used to construct the real-time corporate sales index. The first and second panels provide daily time series of consumer activities to GAP and Target Corp over the period of Dec. 2012 to Nov. 2013, while the third panel describes the consumer activities to all the firms in the sample. y-axis plots daily consumer activities, scaled by the highest value of daily activities during the time period. The highest value is set to 100%. This data is extracted from Andoid mobile devices in the United States.

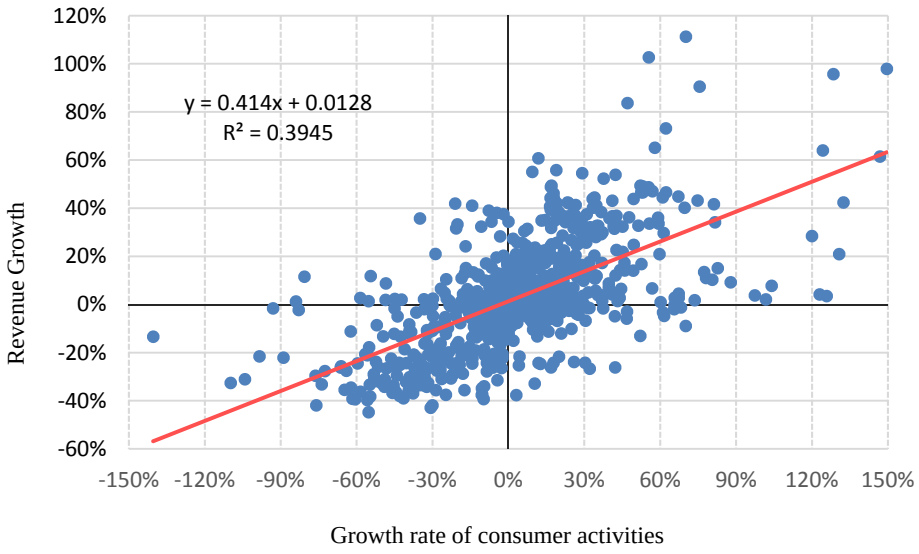

Figure 3. Revenue growth vs. consumer-activity growth. The figure scatter plots revenue growth on the growth rate of consumer activities. The vertical axis is revenue growth and the horizontal axis is the growth rate of consumer activities. The red line is the predicted value of revenue growth. The sample includes US retail firms of fiscal quarter ending between Mar 2009 and July 2014.

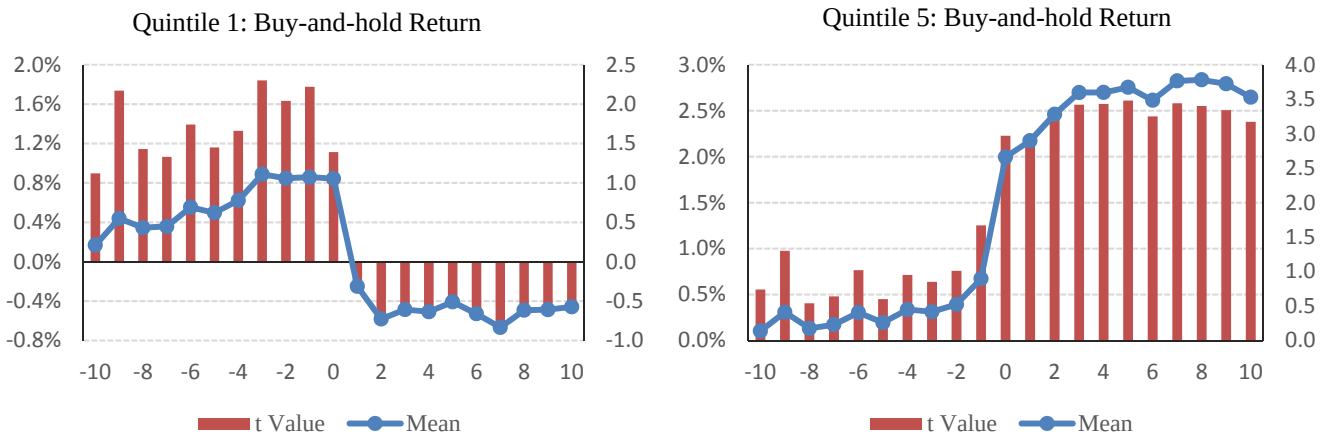

Figure 4. Excess returns around earnings announcement dates. This figure plots the average buy-and-hold returns during the event window from 10 days prior to the earnings announcement date (day 0) to 10 days afterward. Returns are calculated in excess of the market returns of corresponding periods. The first panel shows the average buy-and-hold return of firms in Quintile 1 of WQS, while the second panel shows the results of firms in Quintile 5. The sample includes US retail firms of fiscal quarter ending between Mar 2009 and July 2014.