Beyond the street EPS surprise – when 'other surprises' matter in explaining earnings announcement returns

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ABSTRACT

This study examines when accounting surprises other than the street EPS surprise, i.e., 'other surprises', are useful to investors. First, 'other surprises' are incrementally important when companies use earnings management to beat the analyst consensus EPS forecasts and when earnings quality is low. Second, 'other surprises' are useful in interpreting quarterly results for (i) growth stocks, (ii) stocks with high institutional ownership (particularly by active institutions and blockholders), and (iii) in interpreting the quality of the street EPS surprise. Third, the street EPS surprise shows no association with earnings announcement returns controlling for 'other surprises.' This result reflects that some 'other surprises', such as the net income surprise, are better predictors of future earnings surprises than the street EPS surprise.

Keywords: earnings announcements, earnings announcement puzzle, unexpected news, non-street EPS surprises

JEL Classification: G12, G17, M41

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1. Introduction

Since the early 2000s, there has been an increasing availability of forecasts other than street EPS on I/B/E/S, henceforth 'other forecasts', such as revenue, gross margin, EBITDA, and GAAP earnings. These forecasts allow investors (i) to calculate aggregate firm performance on an alternative basis to the street EPS, and (ii) to decompose the street EPS surprise into its subcomponents. The former is important considering the regulator's and investors' concerns that firms manage street EPS numbers to beat analyst expectations at earnings announcements (Bartov et al., 2002, Matsumoto, 2002, Richardson, Teoh and Wysocki 2004). The latter helps investors to identify the drivers of financial performance and measure their persistence. This decomposition can be important depending on the firm's earnings growth profile, if investors prefer other financial performance measures than the street EPS, or the street EPS is of low quality (Black 1998; Bushee 1998, 2001; Cremers, Pareek, and Sautner 2020). Previous research documents that investors use additional accounting information than the street EPS surprise to evaluate earnings announcement results (e.g., Ertimur, Livnat and Martikainen 2003, Jones, Krishnan and Melendrez 2008, DeFond and Hung 2003, Bilinski and Bradshaw 2021, Hand, Laurion, Lawrence and Martin 2022). However, it is unclear when 'other surprises' are useful in explaining earnings announcements returns. This study examines the importance of 'other surprises' for investors and its cross-sectional variation.

I start the analysis by tracking the availability of quarterly non-EPS forecasts on I/B/E/S between 2000–2018. I exclude forecasts not available for at least 30% of I/B/E/S covered firms over the sample period as infrequent forecasts are less useful to investors in assessing quarterly earnings announcements (Ertimur, Mayew and Stubben, 2011). I find that the eight most frequently forecasted items on I/B/E/S are revenue (available for 84% of I/B/E/S covered firms over the sample period), net income (78% availability), pre-tax profit (67%), GAAP EPS (57%), EBITDA

(46%), EBIT (42%), gross margin (33%) and operating profit (31%).[1] Because DeFond and Hung (2003) find that cash flow forecasts help explain earnings announcement returns, I include them in the analysis. Cash flow forecasts are available for 17% of I/B/E/S firms.[2] These statistics show that in recent years, investors have several forecasts available to them, other than street EPS, to assess quarterly earnings results.

Next, I calculate surprises using street EPS forecasts and 'other forecasts' and relate them to abnormal returns in a three-day window around quarterly earnings announcements. Regression analysis corroborates the statistically significant role of all 'other surprises' in explaining earnings announcement returns (Table 3). I observe a significant variation in the economic impact of 'other surprises.' A one-standard-deviation increase in a surprise in the net income and EBITDA associate with a 9.8% higher price reaction. A one-standard-deviation increase in a surprise in the revenue associates with 9.1% higher price reaction, in operating profit with 5.8% higher price reaction, in gross margin 4.6%, in cash flow 2.8% and in GAAP EPS 1.3%. Further, I report significant price reactions to within-quarter revisions in analyst 'other forecast'. Investors will rely on 'other surprises' in assessing earnings announcement news if analyst forecasts convey new value-relevant

[1] Though EBIT and operating profit are often considered similar measures, I/B/E/S reports both EBIT and operating profit forecasts. I/B/E/S defines EBIT as 'the earnings of a company before interest expense and income taxes paid' and operating profit as 'the difference between a company's revenues and its costs and expenditures arising directly out of a company's regular operations. Operating Profit is calculated before any deductions in income owing to nonoperating activities (generally items such as interest expense, corporate tax payments, material gains or losses arising from changes in accounting policy, and the like) and excludes any income derived from outside the firm's regular activities.'

[2] Investigating the time-series frequencies, 'other forecasts' are either infrequent or not available before the fiscal year 2000. By 2018, revenue forecasts are available for 97% of I/B/E/S firms, net income for 96% of I/B/E/S firms, pre-tax profit for 84%, GAAP earnings for 90%, EBITDA for 70%, EBIT for 86%, gross margin for 48%, and cash flow forecasts for 28% of I/B/E/S covered firms. Operating income's availability peaks at 75% in 2011 but declines to almost 0% by 2018. Refinitiv customer support explained that in recent years, 'Operating Income estimates from brokers are updated under EBIT. Only if a broker submits distinct estimates for the two data measures (Operating Income and EBIT), it is updated under the two measures. Since most of the brokers use Operating Income and EBIT interchangeably, I/B/E/S introduced this policy with effect from April 16, 2012 to have uniformity and to display all the estimates under one field.' Thus, though conceptually EBIT and operating profit refer to the same fundamental concept, I/B/E/S was recording both forecasts depending on the naming convention used by the analyst. I follow I/B/E/S and consider the two forecasts separately rather than re-classify operating profit as EBIT.

information. The evidence on significant price reactions to revisions in 'other forecasts' suggests analyst 'other forecasts' convey new information.

The pertinent question is when 'other surprises' are most useful in interpreting earnings announcement results. First, I document that the coefficients on the interaction terms between the availability of 'other surprises' and the street EPS surprise are on average positive. This evidence suggests that 'other surprises' are not only useful on their own, but also help to assess the reliability of the street EPS surprise. This result reflects that relative to 'other forecasts', street EPS forecasts can be a noisy measure of financial performance due to (i) the time-varying changes in the definition of street EPS (Lambert 2004), (ii) analyst opportunistic and misinformed exclusions of persistent items from GAAP when calculating the street EPS (Doyle et al. 2003, Landsman et al. 2007, Christensen et al. 2011, Chen 2010), (iii) the increasing use of repurchase programs to boost per-share measures, which distorts the denominator of the street EPS surprise (Hribar et al 2006, Almeida et al. 2016), and (iv) analysts share forecasts being highly inaccurate (Kaplan et al. 2024). 'other surprises' help investors to gauge the credibility and persistence of street EPS surprises.

Next, I interact 'other surprises' with an indicator for zero or small positive street EPS surprises. These are instances when companies may be using earnings management to beat the analyst consensus benchmark and earnings quality is low. In these cases, street EPS surprises are less reliable performance measures (Degeorge et al., 1999, Bartov et al., 2000, Bartov et al., 2002, Matsumoto, 2002, Richardson et al., 2004). I find that 'other surprises' are incrementally relevant in evaluating results of firms reporting zero or a small street EPS surprise. Thus, investors rationally attach more weight to less noisy measures of firm performance – 'other surprises' – when the reliability of street EPS surprises is low. Further, I document that top-line 'other surprises' such as revenue and cash flow from operations and GAAP EPS are incrementally useful in interpreting financial results of high accruals stocks. In contrast, bottom-line 'other surprises' such as the net

income surprise, are less useful in these cases. Thus, when persistence of bottom-line earnings is lower (Sloan 1996), investor look to the top-line surprises to assess firm performance.

I find that 'other surprises' are more useful in interpreting the results of growth firms, which are earlier in their life cycle, than value firms. Past research suggests that investors may overestimate the persistence of earnings growth for growth firms (La Porta et al. 1997; Rai 1996; Ertimur et al. 2003). Lakonishok et al. (1994) estimate that investors predict current growth will continue for up to nine years whereas it continues for only three years. Bauman and Miller (1997) report that analysts overestimate the earnings growth of growth firms. 'other surprises' help to assess earnings persistence and investors rationally attach more weight to 'other surprises' for growth than value firms.

Finally, I examine the usefulness of 'other surprises' conditional on firm institutional ownership. I document that 'other surprises' are incrementally useful when institutional ownership is high. This result is consistent with institutional investors using a range of information to assess earnings news, which reflects their sophistication and their ability to process complex information conveyed through 'other surprises' (Bartov, Radhakrishnan and Krinsky, 2000). To sharpen the analysis, I split institutional ownership into active and passive following Ferreira and Matos (2008). The former group actively collects and analyzes financial information and I find that they rely more on 'other surprises' to evaluate earnings results. I also document that blockholders pay more attention to 'other surprises' at earnings announcements. Blockholders invest a significant portion of their wealth in select companies, which incentivizes them to actively monitor firm performance (Agrawal and Mandelker 1990, Almazan et al. 2005). They also tend to adopt long-term investment strategies, which makes monitoring more important and 'other surprises' can aid in monitoring.

A corollary of my main analysis is that I can revisit the findings from Hand et al. (2022), who investigate the unconditional relation between 34 non-KPI surprises and quarterly earnings

announcement returns, (i) using a different sample and (ii) alternative research methods. Different research methods do not have to necessarily produce the same results. However, appreciating how findings change under different conditions is important to understand the reliability of findings, which in turn informs practitioners, researchers and regulators.[3]

I find that controlling for 'other surprises', the street EPS surprise often shows no association with quarterly earnings announcement returns, which contrasts the result in Hand et al. (2022). This finding can be explained twofold. First, I document that the net income surprise suffices to capture the explanatory power of the street EPS surprise.[4] This happens because the current period net income surprise is a stronger predictor of future street EPS surprises than the current period street EPS surprise. The evidence on the importance of the net income surprise is stronger when analysts exclude more recurring items from GAAP EPS estimates to arrive at the street EPS forecast. This evidence is consistent with Doyle et al. (2003), Landsman et al. (2007), Christensen et al. (2011), and Chen (2010), who document that analysts exclude persistent components from GAAP earnings to calculate the street EPS forecast. Further, the predictive power of current street EPS surprises for future earnings surprises reduces when firms engage in repurchase programs. No such evidence is present for the net income surprise. This evidence is consistent with buybacks distorting the persistence of per-share measures such as street EPS (Hribar

[3] Drawing a parallel, Knez and Ready (1997) document that the risk premium on the market value of equity disappears when 1% of the most extreme observations is trimmed. This questions the risk premium associated with market capitalization. Kraft, Leone and Wasley (2006, 2007) report that the accrual anomaly disappears with small changes in the research design. Hou, Xue and Zhang (2020) report that 82% of 425 return anomalies are not statistically significant under alternative research design. Kasznik (1999) show that discretionary accrual estimates are correlated with earnings performance, which means that "a researcher is more likely to detect earnings management that increases earnings for the most profitable firms and earnings management that reduces earnings for the least profitable firms" (see also McNichols 2000). Lennox, Francis and Wang (2012) highlight vulnerability of the Heckman model and 'recommend careful reporting of sensitivity analyses and robustness tests, which, surprisingly, are uncommon in accounting studies.' Several other studies document that research conclusions can change under different scenarios and understanding when this happens enhances our knowledge of accounting phenomena.

[4] Hand et al. (2022) do not include the net income surprise in their regression model. Their Appendix 1 shows that almost all firms that have revenue forecasts on I/B/E/S also have net income forecasts. Thus, it is not clear why the net income surprise is missing from the analysis.

et al. 2006, Almeida et al. 2016). As a result, the net income surprise is more informative about future earnings surprises than the street EPS surprise for firms with significant repurchase programs. This latter finding can help to explain why non-per-share surprise measures (net income, EBIT and revenue surprises) tend to show a stronger economic association with earnings announcement returns than per-share surprise measures in my analysis.

Second, I use detail I/B/E/S files to create the street EPS surprise measure compared to Hand et al. (2022), who use summary files to calculate the street EPS surprise. Kaplan, Martin and Xie (2021, p.1827) report that 'I/B/E/S retains in the consensus 46.2% of "stale" forecasts, which should be removed according to I/B/E/S' staleness policies' and that I/B/E/S subjectively 'removes 6% of one-quarter-ahead earnings forecasts before calculating the consensus' and 'subjectively applies policies that govern its removal decisions and accepts feedback from firms that contributes to this subjectivity. […] optimistic forecasts are removed more frequently than pessimistic forecasts, and such asymmetry increases further when removals allow firms to meet or beat the consensus.' Stale forecasts and subjective exclusions can correlate with unobservable firm characteristics, such as incentives to beat the consensus forecast, which in turn associate with higher price reactions at earnings announcements.[5] When I include the summary street EPS surprise with the street EPS surprise calculated from detail files, the former is significant while the latter is not distinguishable from zero. Thus, whether a researcher chooses detail or summary files to calculate the street EPS surprise can affect the conclusions.

The study offers three contributions to the literature. First, I expand prior analyst research to provide evidence on which 'other surprises' and when play an economically significance role in

[5] For example, adjustments to the summary consensus forecast could correlate with managerial incentives to beat earnings forecasts to avoid negative price reactions (Kaplan et al., 2021). In this case, summary street EPS surprises would on average show a stronger association with stock returns as they capture deliberate attempts to document higher accounting performance to elicit positive price reactions.

explaining earnings announcement returns (Aboody and Lev 1998, Francis et al., 2002a, Anilowski, Feng, and Skinner 2007, Bradshaw, Christensen, Gee and Whipple 2018; Beaver et al. 2020; Hand et al. 2022). This evidence enhances our understanding of the types of forecasts investors seek to help them interpret quarterly earnings results. Further, I document that controlling for I/B/E/S 'other surprises', unexpected street EPS (calculated from detail files) lose their association with earnings announcement returns. Relative to 'other forecasts', street EPS forecasts can be a noisy measure of financial performance (Lambert 2004, Doyle et al. 2003, Landsman et al. 2007, Christensen et al. 2011, Chen 2010, Hribar et al 2006, Almeida et al. 2016). Thus, investors rationally attach more weight to measures of firm performance that can be comparatively less noisy, such as net income. This result is important as researchers often use the street EPS surprise as the sole measure of unexpected news disclosed at earnings announcements. This in turn attributes the explanatory power of 'other surprises' to the street EPS surprise, which can result in spurious conclusions.

Second, the findings contribute to the literature on the value relevance of accounting information. This literature tries to understand what accounting information and why is important to investors. Barth, Li and McClure (2023, 1) highlight that 'Prior research finds that value relevance of accounting items, particularly earnings, has declined' and that the literature 'concludes that accounting has lost its relevance.' I highlight that (i) investors use a broader range of accounting information than earnings to evaluate firm performance at quarterly earnings announcements and (ii) the relevance of accounting items varies with firm and investor characteristics, and the quality of the street EPS surprise. My results reveal an evolution in investors' use of accounting information that goes beyond earnings that can inform future research. The results also reconcile the evidence on (i) the declining power of the street EPS to explain the variation in earnings announcement returns (Amir and Lev 1996, Aboody and Lev 1998, Landsman and Maydew 2002, Francis, Schipper and Vincent 2002a) and (ii) the increasing absolute price reactions to earnings announcements

documented by prior literature (Beaver et al. 2018, 2020). Both can be explained by the availability of and investors use of 'other surprise.'

Finally, I highlight the sensitivity of some of the earlier conclusions to alternative research design choices. My evidence suggests that research design choices play a significant role in identifying which 'other surprises' are most relevant in explaining earnings announcement returns. This finding is important as understanding which 'other surprises' are 'the most important' to investors informs our understanding of what accounting information is most valuable to investors.

The rest of the paper is organized as follows. Section 2 discusses the relevant literature and develops the research hypotheses. Section 3 presents the data and section 4 the research methods. Section 5 presents main results on when 'other surprises' are most useful to investors. Section 6 presents additional tests and compares my results with Hand et al. (2022). I conclude in Section 7.

2. Relevant literature and research hypotheses

Several studies attempt to explain the declining relevance of unexpected street EPS in explaining earnings announcement returns (captured by declining earnings response coefficients – ERCs – and R^2). An important literature stream has focused on the joint role of managers disclosing other information than street earnings at earnings announcements and analyst forecasts of these accounting items (e.g., Atiase 1985, Hoskins, Hughes and Ricks 1986, Kross and Schroeder 1989, Livnat and Zarowin 1990, Beaver et al. 2020). Studies document that investors examine information in analyst GAAP earnings forecasts (Bradshaw, Christensen, Gee and Whipple 2018), revenue forecasts (Ertimur et al. 2003), cashflow forecasts (Jones, Krishnan and Melendrez 2008, DeFond and Hung 2003), dividend forecasts (Bilinski and Bradshaw 2021), and Key Performance Indicators forecasts (Givoly, Li, Lourie and Nekrasov 2019) when evaluating earnings results. More recently, Hand et al. (2021, 1389) study 34 non-KPI surprises and report 'that 13 item surprises — 11 income

statement-based and 2 cash flow statement-based analyst and management guidance surprises—reliably explain firms' signed earnings announcement returns.' However, we know less about when 'other surprises' are useful to investors in interpreting earnings results, which is the focus of this study.[6]

'other forecasts' allow investors (i) to calculate aggregate firm performance on an alternative basis to street EPS and (ii) to decompose the street EPS surprise into its subcomponents to identify the drivers of the financial performance and measure their persistence. Previous evidence suggests earnings components are value-relevant (Hirst, Koonce, and Venkataraman 2007, Elliott, Hobson, and Jackson 2011). Disaggregating earnings and calculating totals on other basis that street EPS (i) increases the credibility of accounting numbers (e.g., because earnings manipulations are easier to detect, D'Souza, Ramesh and Shen 2010 and Koonce, Williamson and Winchel 2010), and (ii) helps investors gauge persistence of earnings (Ertimur, Livnat, and Martikainen 2003). Chen, Miao and Shevlin (2015, p. 1018) highlight that '[M]ore detailed disclosure reduces information asymmetry, arguably increases the precision of the information in the financial statements, and provides investors with more information for valuation and mitigates mispricing.'

The set of 'other forecasts' available on I/B/E/S that *disaggregate* street EPS includes revenue, operating cash flows and gross margin. Disaggregation of earnings into its components helps investors to understand the persistence of earnings components, which gauges the quality of street EPS in predicting future earnings and cashflows. To illustrate, the difference between the operating profit forecast and the cashflow (from operations) forecast captures the expected

[6] The finding on the declining relevance of unexpected street EPS in explaining earnings announcement returns, which motivated the research on the importance of 'other surprises', has also been attributed to reducing earnings quality (e.g., Imhoff and Lobo 1992, Teoh and Wong 1993, Ertimur, Livnat and Martikainen 2003), higher book-tax conformity (Hanlon, Maydew and Shevlin, 2008), market inefficiency (Bernard and Thomas 1989, 1990, Lev and Thiagarajan 1993), and economy shift from tangible to intangible assets (Landsman and Maydew 2002). Investors can also use information on other comprehensive income and special items (Jones and Smith 2011), R&D (Lev and Sougiannis 1996, Franzen and Radhakrishnan 2009), and intangibles (Aboody and Lev 1998) to interpret earnings results.

operating accrual component of operating profit. Barth, Beaver, Hand and Landsman (1999) and Barth, Cram and Nelson (2001) find that cashflows dominate accruals in valuation and in forecasting future abnormal returns. Comparing revenue forecasts and street EPS estimates captures expected total expenses. Ertimur et al. (2003) highlight that revenue surprises are more persistent than expense surprises since expense surprises aggregate components of different persistence and investors attach less weight to less persistent surprises. Disaggregation also helps identify cases of earnings management. For example, a firm that beats the street EPS consensus but reports disappointing cash flow news is likely using accrual management to achieve the earnings benchmark (Ertimur et al. 2003, DeFond and Hung 2003). Appendix A illustrates how 'other surprises' disaggregate earnings into components and includes examples of incremental information gained from 'other surprises.'

The 'other forecasts' also include measures of aggregate performance calculated on an alternative basis to street EPS, such as net income, EBITDA, and GAAP earnings. These measures (i) provide information on items excluded in calculating street EPS and (ii) non-per-share measures help disentangle cases where firms grow earnings through buyback programs. Analysts and investors increasingly emphasize non-GAAP performance measures as better indicators of core and future performance and argue that they are more value-relevant (Bradshaw and Sloan 2002, Kolev, Marquardt and McVay 2008, Bentley et al. 2018). However, the choice of items to exclude from calculating street EPS is subjective, varies over time, and can be opportunistic. Doyle et al. (2003), Landsman et al. (2007), Christensen, Merkley, Tucker and Venkataraman (2011) and Chen (2010) find that analysts exclude from calculating street earnings items that predict future operating cash flows and earnings. Baik et al. (2009) report that trading and investment banking considerations prompt analysts to exclude persistent expenses in calculating street earnings. Investors can use the alternative aggregate performance measures to identify granular street EPS exclusions, which

provides a clearer picture of the quality of street EPS surprises. To illustrate, comparing the EBITDA forecast to the operating profit forecast captures the effect of expected non-operating expenses related to depreciation and amortization. Black and Christensen (2009) find that managers frequently remove depreciation from their GAAP earnings numbers to achieve a target operating profit and meet analyst street earnings expectations on a non-GAAP basis. The difference between GAAP EPS and street EPS forecasts captures total exclusions from GAAP calculation that analysts consider to not be value relevant, even if these exclusions predict future earnings and returns (Doyle et al. 2003, Baik et al. 2009, Black and Christensen 2009, Barth et al. 2012, Doyle et al. 2013). Further, comparing the net income forecast with the street EPS forecast helps assess the extent to which firms meet analyst street EPS expectations through share buybacks. Hribar, Jenkins and Johnson (2006) and Almeida, Fos and Kronlund (2016) find that firms use share repurchases to avoid missing analysts' earnings expectations and mitigate the consequent negative stock price response.

This study empirically examines which 'other surprises', why and when explain the price reaction to earnings announcements beyond the street EPS surprise. I propose that 'other surprises' will be more useful in cases where a firm is likely using earnings management to meet and beat the analyst consensus EPS forecast (Richardson et al., 2004). 'other surprises' should also be more relevant for firms when earnings are of low quality. In these cases, the street EPS surprise poorly captures the underlying economic performance of the firm and its persistence is lower (Sloan, 1996, Degeorge et al., 1999, Bartov et al., 2000, Bartov et al., 2002, Matsumoto, 2002).

Hypothesis 1a: 'other surprises' are more useful to investors for firms that engage in earnings management to meet and beat the analyst consensus EPS forecast at earnings announcements.

Hypothesis 1b: 'other surprises' are more useful to investors when earnings quality is low.

Previous research suggests that investors overestimate the persistence of earnings in high-growth firms. Lakonishok et al. (1994) estimate that investors predict the current earnings growth will continue for up to nine years whereas it continues for only three years for growth firms. Bauman and Miller (1997) report that analysts overestimate the earnings growth of growth firms. These findings reflect that growth firms are earlier in their life cycle than value firms and investors may be overly optimistic about persistence in their growth rates. As the earnings persistence of high-growth firms is in doubt, investors can use 'other surprises' to evaluate the persistence of earnings drivers, such as revenue and gross margin, and to assess firm quarterly results. For example, disappointing revenue and gross margin surprises suggest that earnings growth is likely to reduce in the future, i.e., earnings surprises are less persistent. If earnings surprises are a poor indicator of future performance, investors can use other accounting measures, such as revenue surprises, in this case. 'other surprises' can indicate persistence in demand for the company's products and a firm's ability to maintain margins to drive bottom-line growth. Ertimur et al. (2003) state that investors are more concerned about revenue growth than about a firm's ability to manage costs for growth firms. Cost management is more important for value firms where managers need to control expenses to maintain profits even with a slowdown in revenue growth and falling demand. These predictions lead to the second hypothesis.

Hypothesis 2: 'other surprises' are more useful to investors when evaluating performance of growth firms compared to value firms.

Disaggregating the street EPS surprise into components using 'other surprises' can be informative but 'other surprises' can also be costly to process. Past research suggests that institutional investors are sophisticated in the way they analyze and interpret financial information (Walther, 1997, Bartov et al., 2000). Malmendier and Shanthikumar (2009) report that institutional investors react to both analyst EPS forecasts revisions and to stock recommendation revisions and

correct for bias in the latter. Less sophisticated investors focus only on stock recommendations. Mikhail et al. (2007) find that more sophisticated investors react more strongly to the information revealed in analyst earnings forecast revisions. Collins, Gong and Hribar (2003) report that stock prices of firms with higher institutional ownership more accurately reflect the persistence of accruals. Frederickson and Miller (2004) report that sophisticated investors are less likely to overprice a stock when a company reports both GAAP and optimistic pro forma disclosures.

However, research also suggests that institutional investors are not always efficient in interpreting accounting information (Bernard and Thomas 1989, Sloan 1996, Fairfield et al. 2003, Balakrishnan et al. 2010). For example, the post-earnings-announcement drift literature attributes return predictability to investors underreacting to earnings news. Lakonishok et al. (1994) argue that investors extrapolate past performance too far into the future leading to disappointing future returns of growth firms. Edelen et al. (2016, 472) "examine institutional demand prior to well-known stock return anomalies and find that institutions have a strong tendency to buy stocks classified as overvalued (short leg of anomaly), and that these stocks have particularly negative ex post abnormal returns" and highlight that "bias in managers' cash flow expectations offers a straightforward interpretation of the earnings announcement evidence; but it also represents a particularly strong contradiction of the notion that institutions are sophisticated."

There are also likely differences in how institutional investors with different trading styles weigh accounting information. Long-run investors may be more concerned with the top-line accounting numbers such as revenue and gross margin whereas short-run investors may focus more on bottom-line profitability. This prediction is based on the evidence in Black (1998) and Bushee (1998, 2001) that short-term investors prefer current earnings over long-term earnings and can pressure managers to engage in earnings management to report higher earnings (Cremers, Pareek, and Sautner 2020). Long-term investors do not have a preference for short-term earnings over long-

term earnings (Bushee 2001) and constraint earnings management (Koh 2007). Heterogeneity in preferences for different accounting information by short-term compared to long-term investors can lead to differences in how they weigh 'other surprises', which motives this analysis.

Hypothesis 3: Institutional investors find 'other surprises' are more useful in interpreting firm earnings results.

Finally, I expect that investors will find 'other surprises' useful in interpreting the quality of the street EPS surprise. Investors may be interested in understanding if a high street EPS surprise reflects higher than anticipated growth in consumer demand, thus a higher revenue surprise, or better cost management, thus a lower cost surprise. Ertimur et al. (2003, 185) highlight that 'the revenue surprise is more persistent and/or less noisy than the expense reduction surprise' signaling a more persistent (higher quality) street EPS surprise. Further, investors may use 'other surprises' to gauge the quality of the street EPS in cases when (i) a firm engages in significant stock repurchases that distort the denominator of the street EPS surprise, and (ii) they suspect a firm may engage in opportunistic exclusions of persistent items to generate the street EPS forecast that beats the consensus estimate. Thus, the final prediction is

Hypothesis 4: 'other surprises' are useful to investors in interpreting the quality of the street EPS surprise.

3. Data and descriptive evidence

I start by collecting all quarterly forecasts available on I/B/E/S for the period 2000–2018. I begin in 2000 because it is the first year with available cash flow and EBITDA forecasts. I stop in 2018 to avoid the influence of the COVID-19 pandemic in tests that look at predicting future firm performance. There are 21 specific types of forecasts available on I/B/E/S, with the average frequency ranging between 84% for revenue estimates to close to 0% for Cash Earnings Per Share.

To gauge the availability of each forecast over time, Table 1 presents the proportion of I/B/E/S firms that have at least one non-street EPS forecast over the sample period. To make comparisons meaningful, I express these proportions as percentage of firms with at least one street EPS forecast.[7]

[Table 1 around here]

Based on Table 1, I make three sample selection choices. First, because infrequent forecasts are of limited usefulness to investors, I choose to focus on forecasts available on average for at least 30% of I/B/E/S covered firms over the sample period. This criterion retains forecasts of street EPS, revenue, net income, pre-tax profit, GAAP earnings, EBIT, EBITDA, gross margin and operating profit. Panel A of Appendix B provides the definitions of these ten forecasts. Second, because DeFond and Hung (2003) find that cash flow forecast surprises help explain earnings announcement returns, I include them in the analysis though they are available, on average, for only 17% of I/B/E/S firms. Third, I include the net income forecast rather than the pre-tax profit forecast as the former has higher availability and the two surprises are highly correlated at 0.85. For the same reason, I keep the EBITDA forecast rather than the EBIT forecast. I examine the usefulness of pre-tax profit and EBIT surprises in explaining the variation in quarterly earnings announcement returns in sensitivity tests. The market and accounting data for calculating price reactions and control variables in the analysis is from CRSP and Compustat.

Examining the time-trends in the availability of the seven forecasts other than street EPS in Table 1, there is evidence of a gradual increase in the frequency of 'other forecasts' with revenue and net income forecasts becoming available for over 70% of I/B/E/S covered firms in 2002. By 2018, revenue and net income forecasts are available for 96% of firms, GAAP earnings for 90%, EBITDA for 70%, gross margin for 48%, and cash flow forecasts for 27% of firms. Availability of operating

[7] Virtually all I/B/E/S covered firms have at least one street EPS forecast in a fiscal year and the proportions are unchanged when I allow for analyst covered stocks without street EPS.

income peaks in 75% in 2011 but declines to almost 0% by 2018. Refinitiv Customer Support explained that this decline is attributable to I/B/E/S reclassification of operating income as EBIT. Appendix B presents the time-series evidence on (i) the proportion of analysts issuing 'other forecasts' and (ii) the number of 'other forecast' compared to the number of EPS estimates for an analyst-firm-year-quarter. These proportions are close to the Table 1 results, which suggests that most analysts produce 'other forecasts' and the frequency of 'other forecasts' is similar to that of EPS estimates in the later sample period.[8]

4. Price reactions to quarterly earnings announcements

4.1 The surprise measures

Following previous studies (Brown and Han 1992, Mendenhall 2004, Datta and Dhillon 1993, Jegadeesh and Livnat 2006, Livnat and Mendenhall 2006), I calculate firm *I* quarter *q* surprise as the difference between the actual value, $Actual_{i,q}$, and analysts' quarterly consensus forecast, $consensus\ forecast_{i,q}$ calculated as the mean of analyst forecasts issued 90 days before the earnings announcement. To render surprise magnitudes comparable, I scale net income (NI), revenue (SAL), operating profit (OPR) and EBITDA (EBT), which are expressed in USD million, by firm market capitalization measured five days before the earnings announcements, $MV_{i,q}$,

$$SU\ (SAL, OPR, NI, EBITDA)_{i,q} = \frac{Actual_{i,q} - consensus\ forecast_{i,q}}{MV_{i,q}}. \quad (1)$$

I/B/E/S provides street EPS (EPS) and GAAP EPS (GPS) and cash flow forecasts (CPS) on a per-share basis and I scale them by the stock price measured five days before the earnings announcement,

[8] Appendix B results are similar to previous evidence. For example, Bilinski and Eames (2018) report that the proportion of joint one-year-ahead revenue and EPS estimates of 55.1% over the period 2000–2013 compared to 62% in Panel B.

$$SU\ (EPS, GPS, CPS)_{i,q} = \frac{Actual_{i,q} - consensus\ forecast_{i,q}}{P_{i,q}}. \quad (2)$$

I calculate the gross margin (GRM) surprise as a percentage by scaling by $1 + |Actual_{i,q}|$ to avoid dividing by zero and a negative number in the denominator,

$$SU\ (GRM)_{i,q} = \frac{Actual_{iq} - consensus\ forecast_{iq}}{1 + |Actual_{iq}|}. \quad (3)$$

I assume a zero surprise for firm-quarters with a missing analyst forecast to calculate a surprise measure. I winsorize all surprises at the top and bottom 1% of the distribution to control for outliers.

Panel A of Table 2 presents descriptive statistics for the quarterly surprises based on the street EPS and the seven 'other forecasts.' All median surprises are positive, which is consistent with the evidence that managers try to beat analyst expectations and analysts make it easy for firms to beat their forecasts to curry favours with managers (Graham, Harvey and Rajgopal 2005, Jensen, Murphy and Wruck 2004). Negative mean quarterly surprises are consistent with Bradshaw et al. (2018), who report a negative average GAAP surprise, and Ertimur et al. (2003), who find a negative mean street EPS surprise, and reflect that early in the quarter, analyst forecasts tend to be too high compared to the actual values prompting managers to walk-down analyst expectations (Richardson et al. 2004).

[Table 2 around here]

Investors will rely on analyst forecasts if these associate with higher accuracy than random walk estimates. Thus, I compare the error in analyst forecasts to that in random walk forecasts. I calculate forecast errors for analyst estimates as the absolute difference between the actual and the consensus forecast. Random walk forecast error is defined as the absolute difference between the current and the previous quarter I/B/E/S actual. I use the current and previous quarter I/B/E/S actuals rather than Compustat values to calculate the random walk forecasts to ensure the

forecasting basis is consistent with analyst estimates. For comparability, I scale forecast errors by either the market capitalization or the stock price in a similar way to surprises in equations 1–3.

Panel B of Table 2 compares mean and median absolute forecast errors for analyst and random walk forecasts. In all cases, analyst forecasts are significantly more accurate compared to random walk estimates. The magnitudes of differences in accuracy are comparable with prior evidence. For example, Bradshaw et al.'s (2018) median percentage difference between analyst and random walk GAAP forecast errors is 45% compared to 51.11% in Table 2. The percentage difference in errors for cash flow estimates is 33% in Givoly et al. (2009) and 36% in Table 2. Panel C reports Pearson correlations between the surprises. Not surprisingly, the correlations are all positive and the magnitudes do not suggest potential collinearity issues related to overlapping information.

4.2 Regression analysis

The first test examines (i) which 'other surprises' investors use in assessing information revealed in quarterly earnings press releases and (ii) their economic effect in explaining earnings announcement returns. This test is essential to examine if earlier results (e.g., Bradshaw et al. 2018, Ertimur et al. 2003, Jones et al. 2008, DeFond and Hung 2003, Bilinski 2014, Bilinski and Bradshaw 2021 and Hand et al. 2022) replicate in my sample.

For this test, I regress price reactions cumulated over a three-day window centered on quarterly earnings announcements in year *y*, $CAR_{i,q,y}$, on unexpected street EPS and 'other surprises'. This approach is consistent with previous research (e.g., Aboody and Lev 1998, Anilowski, Feng, and Skinner 2007, Bradshaw, Christensen, Gee and Whipple 2018, Ertimur et al. 2003, Jones, Krishnan and Melendrez 2008, DeFond and Hung 2003, Hand et al., 2022). The regression model has the form:

$$CAR_{i,q,y} = \beta_0 + \beta_1 EPS\ SU_{i,q,y} + \beta_2 SAL\ SU_{i,q,y} + \beta_3 GRM\ SU_{i,q,y} + \beta_4 EBT\ SU_{i,q,y} + \beta_5 OPR\ SU_{i,q,y} + \beta_6 NI\ SU_{i,q,y} + \beta_7 GPS\ SU_{i,q,y} + \beta_8 CPS\ SU_{i,q,y} + Controls + \omega_y + \varphi_q + \vartheta_i + e_{i,q,y} \quad (4)$$

where *Controls* is a vector of variables that prior research shows to correlate with earnings announcements returns. This list of variables includes the number of analysts covering a stock, firm market capitalization, the book-to-market ratio, return on assets, accruals, leverage, the dividend payout ratio, percentage institutional ownership, and Herfindahl index measuring institutional concentration (Atiase, Bamber and Tse 1989, Hayn 1995, Darrough and Ye 2007, Franzen and Radhakrishnan 2009, Beaver, McNichols and Wang 2018). Panel C of Appendix B presents definitions of the control variables. ω_y, φ_q and ϑ_i capture year, quarter and firm-fixed effects, respectively. Because 'other forecasts' become gradually and non-uniformly available over time, I assume zero surprise if the specific forecast is not available for a firm. This approach mimics the implicit assumption in prior research that does not control for 'other surprises' and should bias coefficients on 'other surprises' towards zero. I test sensitivity of the conclusions to this assumption in robustness tests. I dual-cluster the regression standard errors by firm and year.

The first columns of Table 3, Panel A, report equation 4 regression results with only the street EPS surprise, which mirrors the typical regression specification in previous studies. The coefficient on the street EPS surprise is significant and similar in magnitude to coefficients from prior research. For example, DeFong and Hung (2003) find a coefficient of 0.13. Next, I present results for equation 4 without firm-fixed effects. The coefficients on 'other surprises' are on average significantly positive.[9] To address the concern that results could be affected by firm-specific characteristics that correlate with both the propensity to report 'other forecasts' and price reactions

[9] The coefficients on 'other surprises' are comparable to earlier studies that use individual 'other surprises.' For example, Ertimur et al. (2003) find a coefficient on the revenue surprise of 0.349 compared to my coefficient of 0.382 in Table 3.

to earnings announcements, column 'Full model' reports result for equation 4 when I also control for firm-fixed effects. The coefficients on all 'other surprises' are significant. However, the EPS surprise shows no significant association with earnings announcements returns in the full model.[10] This evidence suggests that omitting 'other surprises' from a price reaction model can increase the earnings response coefficient due to the correlation between the street EPS surprise and omitted 'other surprises.' Section 6.2 explains how the differences in persistence of the street EPS surprise compared to 'other surprises' can help to explain why the coefficient on the street EPS surprise becomes insignificant.

[Table 3 around here]

4.3 Assessing the economic significance of 'other surprises'

The economic magnitudes of 'other surprises' are material: a one standard-deviation increase in the net income and EBITDA surprises associates with 9.8% higher price reaction to earnings announcements. The economic magnitudes for the remaining surprises are 9.1% for the revenue surprise, 5.8% for the operating profit surprise, 4.6% for the gross margin surprise, 2.8% for the cash flow surprise, and 1.3% for unexpected GAAP EPS news. It is useful to note that the pooled cross-sectional coefficients on 'other surprises' are biased downwards as 'other forecasts' become gradually available over the sample period.[11]

Comparing the economic magnitude of coefficients, surprises measuring performance on a non-per-share basis (net income, EBITDA and revenue) seem relatively more important to investors than per-share measures (GAAP EPS and cashflow per share) and percentage measures (gross

[10] The evidence on decreasing earnings response coefficient is consistent with earlier research that includes 'other surprises' individually. For example, Givoly et al. (2009) report that ERCs reduce by 20.5%, from 0.034 to 0.027, when controlling for cash flow surprises.

[11] As the availability of 'other surprises' increases, I should observe the magnitudes of coefficients to increase. I confirm this prediction in untabulated results.

margin). To push this analysis further, I group surprises into (i) non-per-share surprises that include SAL SU, EBT SU, GRM SU, OPR SU and NI SU and (ii) per-share surprises that include GPS SU and CPS SU. I then report average annual coefficients for each group in Panel B of Table 3. To make comparison of coefficient easier, I standardize variables to a mean of zero and unit standard deviation. I observe that price reactions to non-per-share surprises tend to be higher (three times on average), than reactions to per-share measures (the t-test for the difference in the time-series average of coefficients between per-share and non-per-share measures is 11.13.). Non-per-share surprises' economic effect can be up to 10 times higher in magnitude in some years compared to the effect of per-share measures.

The result in Panel B may reflect the increasing frequency and magnitude of buyback programs that can distort per-share measures. Hribar et al. (2006) and Almeida et al. (2016) highlight that firms may use repurchases to inflate per-share measures, such as EPS, to help them beat the analyst consensus forecast. This happens if the number of shares outstanding used by analysts is larger than reported by a firm (due to share repurchase).[12] To test this prediction, in untabulated results, I examine whether investors react more to non-per-share surprise measures in cases when a company announced a repurchase program in the previous 12 months. Specifically, I interact the street EPS surprise and 'other surprises' with the declared percentage number of shares a company intends to repurchase disclosed at the repurchase announcement made over the previous 12 months. If a firm did not announce a repurchase over the previous 12 months, I set the variable to zero. I find that the coefficient on the interaction term between the repurchase magnitude and the street EPS surprises is negative. This evidence is consistent with hypothesis 4. In contrast, the interaction term with the net income surprises is significantly positive. These conclusions are unchanged when I

[12] *The Financial Times* highlights that quarterly buybacks grew from around $25billion in early 2000s to $223billiion in quarter 4 of 2018, a ten-fold increase (Henderson, 2019).

use the actual number of shares repurchased in the buyback program. The evidence that per-share measures show stronger relevance is also consistent with Kaplan, Marshall, Mathis, and Wang (2024), who report that analyst 'share forecasts are highly inaccurate, less accurate even than lagged shares outstanding.' Overall, I find evidence consistent with investors attaching more weight to 'other surprises' not distorted by buyback programs.

As a complementary test for the importance of 'other surprises', I examine the changes in the adjusted R^2. Table 3 results indicate that the adjusted R^2 increases over four-fold when I include the 'other surprises' in the analysis, from 1.61% when the street EPS surprise is the sole surprises measure to 6.57% for the model without firm-fixed effects.[13] Thus, the 'other surprises' add significant explanatory power for the variation in earnings announcement returns.[14]

Hand et al. (2022, 1389) report that the street EPS surprise and the EPS guidance, jointly with the sales surprise and the sales guidance surprise, are among 'the most important surprises', as judged by the t-statistic. To make a more direct comparison to their results, the last column reports results for Equation (4) augmented with the sales guidance surprise and the street EPS guidance surprise using the same definition as in Hand et al. (2022). Specifically, the EPS guidance surprise is the price-scaled difference between management guidance for the next quarter EPS and the analyst next-quarter consensus EPS forecast at the time the guidance was issued. The sales guidance is defined in the same way but scaled by market capitalization. I assume zero surprise if guidance is missing. Neither guidance surprise is significant in the model. Guidance measures are significant only in a sample of non-missing guidance observations, which comprise around 19% of the full

[13] Low adjusted R^2 from the model with only the street EPS surprise is similar to the evidence in earlier research. For example, DeFong and Hung's (2003) adjusted R^2 for a univariate regression is 0.4% and Ertimur et al.'s (2003) is 0.2%.
[14] To gauge the explanatory power of equation 4 over time, Figure C1 in Appendix C plots the annual adjusted R^2 values from year-quarter regressions where I average quarterly adjusted R^2 by year. The adjusted R^2 increases as more 'other surprises' become available on I/B/E/S over time reaching a peak of 11.4% in 2013 and averaging around 9.6% over the subsequent years. In contrast, the adjusted R^2 from regressions that include only the street EPS surprise are generally low at around 2% consistent with earlier research (e.g., Landsman and Maydew 2002, Francis et al., 2002a).

sample observations that I report in Appendix D. Thus, the three of the 'most important' measures from Hand et al. (2022) do not show significant association with earnings announcements returns using an alternative research design. This highlights that results on the association between accounting surprises and quarterly returns are sensitive to the research design choices. In Appendix E, I report additional tests that corroborate the evidence on significant price reactions to 'other surprises'.

5. Cross-sectional evidence on when 'other surprises' are useful to investors

In this section, I present conditional regression results where I augment equation (4) with variables capturing differential usefulness of other forecasts. Specifically, I first document that 'other surprises' are incrementally useful in cases when firms are more likely to use earnings management to beat the consensus EPS forecasts. Next, I report that 'other surprises' are incrementally useful in interpreting earnings results for (i) high accrual stocks, (ii) growth compared to value stocks, and (iii) high institutional ownership stocks. Finally, I show that 'other surprises' aid in assessing the quality of street EPS surprises. The regression model I use is

$$\begin{aligned} CAR_{i,q,y} = {} & \big(\beta_0 + \beta_1 EPS\ SU_{i,q,y} + \beta_2 SAL\ SU_{i,q,y} + \beta_3 GRM\ SU_{i,q,y} + \beta_4 EBT\ SU_{i,q,y} \\ & + \beta_5 OPR\ SU_{i,q,y} + \beta_6 NI\ SU_{i,q,y} + \beta_7 GPS\ SU_{i,q,y} + \beta_8 CPS\ SU_{i,q,y}\big) \times (1 + X_{i,q,y}) \\ & + Controls + \omega_y + \varphi_q + \vartheta_i + e_{i,q,y} \end{aligned} \quad (5)$$

where *X* is the conditioning variable.

5.1 The moderating effect of 'other surprises' for small positive street EPS surprises

The first test investigates cases when firms report small positive street EPS surprises. Previous studies suggest that small positive street EPS surprises may capture instances of earnings

management as companies select accounting methods to meet or slightly beat the analyst consensus forecasts (Bartov et al., 2000; Degeorge et al., 1999). In these cases, street EPS surprises are less informative of future earnings. They may even associate with negative price reactions since the surprise captures earnings management, not the firm's economic activity. 'other surprises' may better inform investors about the underlying firm performance when managers report zero or small positive street EPS news.

To test this prediction, I create an indicator variable that takes a value of one for zero or one-cent street EPS surprises and set it to zero otherwise. Column 'X=Small EPS SU' in Table 4 reports a negative coefficient on the street EPS surprise when firms meet or slightly beat the consensus forecast, consistent with Ertimur et al. (2003). However, the coefficients on 'other surprises' are mostly positive in those cases. This result is consistent with hypothesis 1a and suggests that investors place more weight on 'other surprises' when the positive street EPS surprise is likely to be attributable to earnings management.

[Table 4]

5.2 The moderating effect of 'other surprises' for high accruals stocks

Next, I examine the usefulness of 'other surprises' for high accruals stocks, which researchers frequently associate with low earnings quality due to lower accruals persistence relative to cash flows (Sloan, 1996). High accruals can also associate with a higher likelihood of earnings management (Sloan, 1996, Richardson et al., 2005). Top-line surprises, such as the revenue surprise, should be more relevant for evaluating the performance of firms with high accruals compared to bottom-line surprises, such as net income (DeFond and Park 2001). This is because top-line items include fewer accrual components than bottom-line items, thus, should be relatively more persistent. Intuitively,

revenue includes fewer accrual components.[15] Therefore, investors should attach more weight to revenue than bottom-line items news such as net income for high accrual firms.

My measure of accruals is based on annual accruals ranking for the sample firms and identifies firms with significant managerial discretion in preparing financial statements, e.g., due to the complication of the underlying transactions. These cases can reflect both operational complexity and managerial opportunism. I create this measure in the following way. First, I rank all stocks each year by the magnitude of total asset-scaled accruals. I then create an indicator variable for firms in the top accrual tercile, *High accruals indicator*, which I interact with the surprise measures.

Column 'X=High accruals indicator' in Table 4 suggests that investors value revenue and operating cash flow surprises more for high accrual stocks, a result consistent with these surprises capturing more persistent fundamentals. Coefficients on surprises based on bottom-line items, such as the net income surprise, are negative. This evidence is consistent with accruals reducing the persistence of bottom-line items and investors attaching less weight to these surprises. This result suggests a more nuanced relation between earnings announcement returns and 'other surprises' when earnings quality is low than suggested by hypothesis 1b. Specifically, it is the top-line surprises such as revenue and operating cash flow surprises that are more useful to investors when earnings quality is low.

5.3 The moderating effect of 'other surprises' for value vs. growth firms

This section examines whether 'other surprises' are incrementally useful in assessing earnings announcement news of firms with less persistent fundamentals. I follow Ertimur et al. (2003) and consider the differential signaling role of current period surprises for growth compared to value

[15] Ertimur et al. (2003) also argue that expense manipulations are easier to implement and harder to identify than revenue manipulations.

stocks. Value firms tend to be in the later stages of their lifecycles where earnings are more predictable and better understood by investors (Ertimur et al. 2003). In contrast, research suggests that investors may overestimate the persistence of earnings growth for growth firms. Mian and Sankaraguruswamy (2012) report stronger price reactions to earnings surprises for high-growth firms that they attribute to higher investor sentiment about these stocks. Bauman and Miller (1997) report that analysts underestimate the earnings of value stocks but overestimate the earnings of growth stocks. 'other surprises' can help investors to evaluate persistence in earnings growth.

Column 'X=B/M' in Table 4 reports regression results when I interact surprises with the book-to-market ratio. The coefficients on the interaction terms for 'other surprises' are mostly negative, consistent with these surprises being more useful in assessing the performance of growth compared to value stocks. This result is consistent with hypothesis 2. Interestingly, street EPS and GAAP EPS surprises are incrementally useful for value stocks, which is consistent with Rai (1996).

5.4 The moderating effect of 'other surprises' for high institutional ownership stocks

Disaggregated forecasts can be informative, but they can also be more costly to process. Institutional investors have the resources and expertise to process a range of information revealed at earnings announcements (Utama and Cready 1997). Thus, I expect price reactions to 'other surprises' to be stronger in the presence of significant institutional ownership. I test this prediction by interacting the surprise measures with the percentage institutional ownership. Column 'Institutional ownership' in Table 5 reports regression results with these interaction terms.[16] The positive coefficients on the interactions between IO and revenue, operating profit, net income and GAAP surprises are consistent with the prediction that 'other surprises' have a stronger price effect in the presence of institutional ownership. This evidence is consistent with hypothesis 3.

[16] I do not report coefficients on uninteracted 'other surprise' to make the table results easier to read.

[Table 5]

Active investors who actively collect and analyze financial information should use 'other surprises' more extensively compared to passive investors. Following Ferreira and Matos (2008) and similar to Brickley, Lease and Smith (1988) and Almazan, Hartzell and Starks (2005), I classify mutual fund managers and investment advisers as active investors. I classify bank trusts, insurance companies, and other institutions (e.g., pension funds, endowments) as passive investors. Then, I calculate percentage ownership by active, IO_active, and passive investors, IO_passive, which effectively splits total ownership between these two groups. I then interact active and passive ownership with 'other surprises.' Column 'Active and passive IO' documents that it is mainly active institutional investors who use 'other surprises' to evaluate the earnings results.

Blockholders invest a significant proportion of their wealth in select companies, which incentivizes them to actively monitor firm performance (Agrawal and Mandelker 1990, Almazan et al. 2005). Blockholders tend to adopt long-term investment strategy as their stock sales can exert downward pressure on the stock price, which makes monitoring more important. Kang, Luo and Na (2018) report that blockholdings show a positive association with forced CEO turnover-performance sensitivity, abnormal returns around forced CEO turnover announcements and 13D filings, and changes in firm value, consistent with blockholders' active monitoring. Dechow et al. (1996) highlight that blockholders effectively monitor earnings overstatements that violate GAAP. I expect that blockholders will pay more attention to 'other surprises' compared to non-blockholders as part of their monitoring activities. I define blockholders as institutional investors who hold more than 1% of outstanding shares in terms of market capitalization. I then sum blockholders' ownership for a firm, *Blockholders*, and interact it with 'other surprises'. Column 'Blockholders' reports that 'other surprises' show an incremental price reaction to earnings announcements in the presence of blockholders.

5.5 The interactive role of other surprises with unexpected street EPS news

The final test examines if 'other surprises' aid in assessing the quality of street EPS surprises. Hypothesis 4 predicts that investors can use 'other surprises', such as the revenue surprise, to gauge the persistence in the street EPS surprise. To illustrate, Ertimur et al. (2003) highlight that revenue surprises decompose the street EPS surprise into the more persistent revenue surprise and the less persistent cost surprise. This decomposition helps investors assess the persistence of the street EPS surprises.

To understand if the presence of 'other surprises' facilitates the interpretation of the street EPS surprise, I create indicator variables for the availability of 'other surprises' at the quarterly earnings announcement. Table 6 reports results for equation 4 with interaction terms between the street EPS surprise and indicators for the availability of 'other surprises' at quarterly earnings announcements. The coefficients on the interaction terms between street EPS surprises and the indicators for the availability of top-line 'other surprises' are significant. This evidence suggests that investors find top-line 'other surprises' useful in interpreting the persistence of street EPS surprises. These results are consistent with hypothesis 4.

[Table 6 around here]

There is a concern that the results reported in this section may capture a correlation between the conditioning variable in equation (5), *X*, and the availability of 'other forecasts.' In untabulated results, I examine the availability of 'other forecasts' for terciles split on the conditioning variables. I do not find evidence of significant correlations between the magnitude of the conditioning variables and the availability of other forecasts.

6. Additional tests

6.1 Price reaction to other forecast revisions

Investors will rely on 'other surprises' in assessing earnings announcement news if the forecasts convey new value-relevant information, e.g., about firm the underlying fundamentals. If top-line items are relevant for investors, revisions in forecasts of these components should also convey value-relevant information. For this test, I calculate percentage revisions in street EPS forecasts and 'other forecasts' at the analyst-firm-quarter-year level, which I relate to three-day price reactions centered on the forecast revision day,

$$\begin{aligned} CAR_{i,q,y,a,t} = {} & \gamma_0 + \gamma_1 \Delta EPS_{i,q,y,a,t} + \gamma_2 \Delta SAL_{i,q,y,a,t} + \gamma_3 \Delta GRM_{i,q,y,a,t} + \gamma_4 \Delta EBT_{i,q,y,a,t} \\ & + \gamma_5 \Delta OPR_{i,q,y,a,t} + \gamma_6 \Delta NI_{i,q,y,a,t} + \gamma_7 \Delta GPSU_{i,q,y,a,t} + \gamma_8 \Delta CPS_{i,q,y,a,t} \\ & + Controls + \tau_a + \vartheta_i + \omega_y + \varphi_q + e_{i,q,y,a,t} \end{aligned} \quad (6)$$

where $CAR_{i,q,y,a,t}$ is cumulative abnormal returns at the analyst *a* revision day *t* and τ_a are analyst-fixed effects. I include controls from equation 4. Similar to Keung (2010), I assume a zero revision for forecasts not revised on day *t*.

Table 7 reports regression results for equation 6. I find significant price reactions to revisions in all 'other forecasts'. This result is consistent with 'other forecasts' providing incremental value-relevant information. The latter columns of Table 7 report equation 6 results for the subperiod 2011-2018 where 'other forecasts' are more common. Interestingly, price reactions to street EPS forecast revisions become insignificant in the latter sample period, which mirrors the result from earnings announcement regressions. Thus, in more recent years, investors appear to focus on understanding the drivers of earnings in evaluating firm performance, through the forecasts of earnings components and totals calculated on a different basis than street EPS.

[Table 7]

6.2 Contrasting the results with Hand et al. (2022)

My sample and research methods differ from Hand et al. (2022), which allows me to examine how sensitive the association between accounting surprises and quarterly announcement returns is to research design choices. Of particular importance is the evidence that the street EPS surprise shows no association with earnings announcement returns when I include 'other surprises.' The results below document that this evidence is attributable to (i) including the net incomes surprise in the regression, which has a stronger persistence than the street EPS surprise, (ii) using a different sample that avoids potentially selecting better performing firms and (iii) using detail analyst forecasts rather than the summary file to construct the surprise measures.

6.2.1 A comparison of persistence in net income surprises and street EPS surprises

Table 3 evidence suggests that the explanatory power of street EPS surprises for earnings announcement returns disappears after including 'other surprises' in the analysis. In unreported tests, I find that the ERC becomes insignificant with just the net income surprise.[17] To better understand why the net income surprise has a stronger association with earnings announcement returns than the street EPS surprise, I examine the power of each surprise measure to predict future street EPS surprises.[18] Appendix F results show that the current period net income surprise is a stronger predictor of future street EPS surprises than the current period street EPS surprise. Thus, investors rationally attach more weight to the more persistent surprise. This result is stronger when analysts exclude more recurring items from GAAP EPS estimates to arrive at the street EPS forecast and

[17] Because Hand et al. (2022) do not include the net income surprise in their model, I first examine if excluding the net income surprise will generate a positive ERC. Appendix F, Table F1, reports regression results for equation (4) without the net income surprise. The street EPS surprise becomes significant when I do not control for the net income surprise.
[18] I focus on predicting street EPS, which is often used in stock valuation (Bradshaw 2004, Liu, Nissim and Thomas 2002), firm performance benchmarking (Burgstahler and Dichev 1997, Burgstahler and Eames 1998, Kasznik and McNichols 2002), and cost of capital estimates (Claus and Thomas 2001, Easton and Monahan 2005).

when firms engage in repurchase programs, which distorts the persistence of per-share measures such as street EPS (Hribar et al. 2006, Almeida et al. 2016).

6.2.2 The effect of sample selection

Compared to Hand et al. (2022), I do not restrict the sample to surprises available for more than 5% of firms in a year. This potentially avoids a sample selection bias that can affect inferences. For example, the next-quarter management earnings and sales guidance are available for only 9% of I/B/E/S firms (Hand et al. 2022, Table 2). Management guidance is more common among firms with strong fundamentals, earnings performance, and lower complexity (Lev and Penman, 1990; Miller, 2002, Lee, Matsunaga and Park, 2012; Chen, 2004) and certain surprises, such as the street EPS surprise, may be more important for evaluating quarterly results for these firms.[19] Consistently, Appendix F documents that guidance firms include better performing firms where the street EPS surprise is more relevant in explaining earnings announcement returns. Thus, selecting firms with non-missing guidance information can inflate the relevance of street EPS surprise in explaining earnings announcement returns.

6.2.3 Using detail compared to summary files to calculate the street EPS surprise

Hand et al. (2022) use summary files to calculate accounting surprises. Kaplan et al. (2021) highlight that summary files include stale forecasts (Brown and Han 1992) and are subject to opportunistic management of the consensus forecast by I/B/E/S. The summary street EPS surprise may correlate with unobservable firm characteristics that associate with higher price reactions at earnings

[19] Hand et al. (2022) sample composition can potentially explain why their evidence on the importance of next-quarter guidance contrasts earlier research. Specifically, Ball and Shivakumar (2008, p. 23) find that 'concurrent management forecasts explain only a small amount of the informativeness of earnings announcements', and Rogers and Buskirk (2012) report that the adjusted R^2 increases marginally from 13.5% to 14.3% when they control for management earnings forecasts issued concurrently with earnings announcement.

announcements. Table F5 in Appendix F reports that the summary EPS surprise is significant when included with the surprise measure created from analyst detail forecasts. The only difference between surprises calculated from detailed compared to summary files is that the latter include (i) stale forecasts and (ii) forecasts opportunistically removed by I/B/E/S and it is not obvious why these would have information content. Thus, using summary files produces evidence that is different compared to using detailed files.

7. Conclusions

This study examines when accounting surprises other than the street EPS surprise are useful to investors in interpreting earnings announcements results. I document that 'other surprises' are valuable to investors when companies are more likely to use earnings management to beat the consensus EPS forecasts. Investors also use 'other surprises' to interpret earnings results for low earnings quality firms, growth stocks, high institutional ownership stocks, and in interpreting the quality of the street EPS surprise. Further, by examining several 'other surprises', I can document their relative economic importance.[20] This analysis also reveals that surprises measuring performance on a non-per-share basis (net income, EBITDA and revenue) are relatively more important to investors than per-share measures (GAAP EPS and cashflow per share) and percentage measures (gross margin). Finally, I also document that the conclusion on the importance of the

[20] Hand et al. (2022) focus on the magnitude of t-statistics to evaluate the importance of 'other surprises' and examine changes in adjusted R2 for groups of 'other surprises', which makes it challenging to understand which measures are economically important to investors, a gap this study also addresses. For example, Hand et al. (2022, 1405) report that 'analyst sales surprise (mean t-statistic = 7.6) and management sales guidance surprises (mean t-statistic on one-quarter-ahead sales guidance surprise = 8.2, mean t-statistic on annual sales guidance surprise = 5.0), when judged by t-statistics, are of similar importance to analyst Street earnings surprise.' Economic materially cannot be directly inferred from the t-statistics as it also depends on the variable's standard deviation and correlations between independent variables. For example, using information from Hand et al. (2022), a one-standard-deviation increase in the annual sales guidance has an almost 50% larger economic impact on earnings announcement abnormal returns than a one-standard-deviation increase in the street EPS surprise even though the t-statistic for the former measure is 14% lower.

street EPS surprise in explaining earnings announcements returns is sensitive to research design choices.

The results of this study are important to a wide audience that include managers, investors and researchers. For mangers and investors, I identify the settings when investors attach more weight to 'other surprises' including when they value top-line surprises relatively more compared to bottom-line surprises and per-share surprises compared to non-per share surprises. I also quantify the economic importance of various surprises that investors use to interpret firm quarterly results. This can inform the Investor Relationship departments on how to structure the discussion of firm results in earnings press releases. For researchers, the study highlights the cross-sectional variation in the usefulness of 'other surprises.' As accounting research is moving away from focusing solely on the street EPS surprise as a driver for earnings announcement returns, the study will inform future studies on when to expect various accounting surprises to play an important role in explaining earnings announcement returns.[21] The study also highlights how research design choices can affect the conclusion on the role the street EPS surprise plays in explaining price reactions to quarterly results announcements. These insights are important as accounting literature has a long history of using the street EPS surprises to explain earnings announcement returns. Thus, understanding the research design choices that can affect the association between the street EPS surprise and earnings announcement returns is important to researchers.

[21] Hand et al. (2022, 1410) highlight that 'academic researchers have rarely gone beyond including GAAP or Street earnings when explaining variation in earnings announcement returns. We find just 11 papers since 1968 that have examined analysts' revenue forecasts, and 9 that have studied analysts' cash flow forecasts.'

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Appendix A Variables definitions

Variable	Definition
Panel A: Definitions of I/B/E/S forecasts used in the study based on Thomson Reuters Estimates Glossary	
CPS	Cash Flow per Share is a corporation's cash flow from operations, before investing and financing activities, divided by the weighted average number of common shares outstanding for the year.
EBIT	EBIT represents the earnings of a company before interest expense and income taxes paid.
EBITDA	EBITDA gauges the raw earnings power of a company before debt servicing, corporate taxes, and any allowances made for depreciation and amortization costs the company faces. It is calculated in general form by taking the pretax corporate income of a company, adding back any depreciation and amortization costs charged, plus any interest expense on debt (subtracting any capitalized interest).
EPS	Valuation earnings per share, defined as the EPS that the contributing analyst considers to be that with which to value a security. This figure may include or exclude certain items depending on the contributing analyst's specific model.
GPS	Statutory or reported earnings per share, defined as net profit (on continuous activities) divided by the weighted average number of shares outstanding during the period. In North America this figure is referred to as GAAP Earnings per Share and is calculated according to Generally Accepted Accounting Principles (GAAP), which is reported in SEC filings.
GRM	A company's total sales revenue minus cost of goods sold, divided by the total sales revenue, expressed as a percentage.
NI	Net income is defined as a corporation's after-tax income. In most markets, non-recurring items are backed out of net income and this measure is restricted to income from continuing operations only (also referred to as normalized income).
OPR	Operating Profit is the difference between a company's revenues and its costs and expenditures arising directly out of a company's regular operations. Operating Profit is calculated before any deductions in income owing to nonoperating activities (generally items such as interest expense, corporate tax payments, material gains or losses arising from changes in accounting policy, and the like) and excludes any income derived from outside the firm's regular activities
Pre-tax profit	Profit before taxes is net income before tax expense. Where applicable, extraordinary items and non-recurring charges are subtracted from net income.
Revenue	The Revenue measure is a corporation's net revenue, generally derived from core business activities.
Panel B: The surprise measures	
EPS SU	The quarterly street EPS surprise calculated as the price-scaled difference between the actual EPS for a quarter and the analyst consensus forecast.
SAL SU	The quarterly revenue surprise calculated as the market capitalization-scaled difference between the actual revenue for a quarter and the analyst consensus forecast.
GRM SU	The quarterly gross margin surprise calculated as the difference between the actual gross margin for a quarter and the analyst consensus forecast scaled by 1 plus the absolute actual gross margin.
CPS SU	The quarterly cash flow per share surprise calculated as the price-scaled difference between the actual cash flow per share for a quarter and the analyst consensus forecast.
EBT SU	The quarterly EBITDA surprise calculated as the market capitalization scaled difference between the actual EBITDA for a quarter and the analyst consensus forecast
OPR SU	The quarterly operating profit surprise calculated as the market-capitalization scaled difference between the actual operating profit for a quarter and the analyst consensus forecast.
NI SU	The quarterly net income surprise calculated as the market capitalization scaled difference between the actual net income for a quarter and the analyst consensus forecast.
GPS SU	The quarterly GAAP EPS per-share surprise calculated as the price-scaled difference between the actual GAAP EPS for a quarter and the analyst consensus forecast.

Continued on next page

Appendix A, continued

CPS SU	The quarterly cash flow per share surprise calculated as the price-scaled difference between the actual cash flow per share for a quarter and the analyst consensus forecast.
Panel C: Abnormal returns and control variables	
CAR	Cumulative abnormal return cumulated over a three-day window centered on quarterly earnings announcement. Individual abnormal returns are calculated as the difference between the return on a stock and the return on the VW CRSP market index.
Book-to-market	The book-to-market ratio defined as total equity scaled by market capitalization calculated at the end of the previous fiscal quarter.
Number of analysts	The number of analysts issuing at least one EPS forecast for a firm over the previous 12 months.
Market capitalization	Logged firm's market capitalization
ROA	Operating income before depreciation as a fraction of average total assets based on most recent two periods.
Accrual	Accruals as a fraction of average total assets based on most recent two periods. Accruals are defined as the difference between earnings before extraordinary items and discontinued operations and operating cashflows.
Leverage	Total liabilities as a fraction of total assets.
Dividend payout	Dividends as a fraction of income before extraordinary items. The ratio is set to zero if a firm does not pay dividends.
Small EPS SU	An indicator variable for zero or small positive street EPS surprises
IO	Percentage institutional ownership.
IO_active	Active institutional investors defined as the percentage of shares held by mutual fund managers and investment advisers.
IO_passive	Passive institutional investors defined as percentage of shares held by bank trusts, insurance companies, and other institutions (e.g., pension funds, endowments)
Blockholders	Percentage ownership by blockholders. Blockholders are defined as institutional investors who hold more than 1% of outstanding shares in terms of market capitalization.
Firm effect	Firm-fixed effects.
Year effects	Fiscal-year fixed effects.
Quarter effect	Fiscal quarter fixed effects.

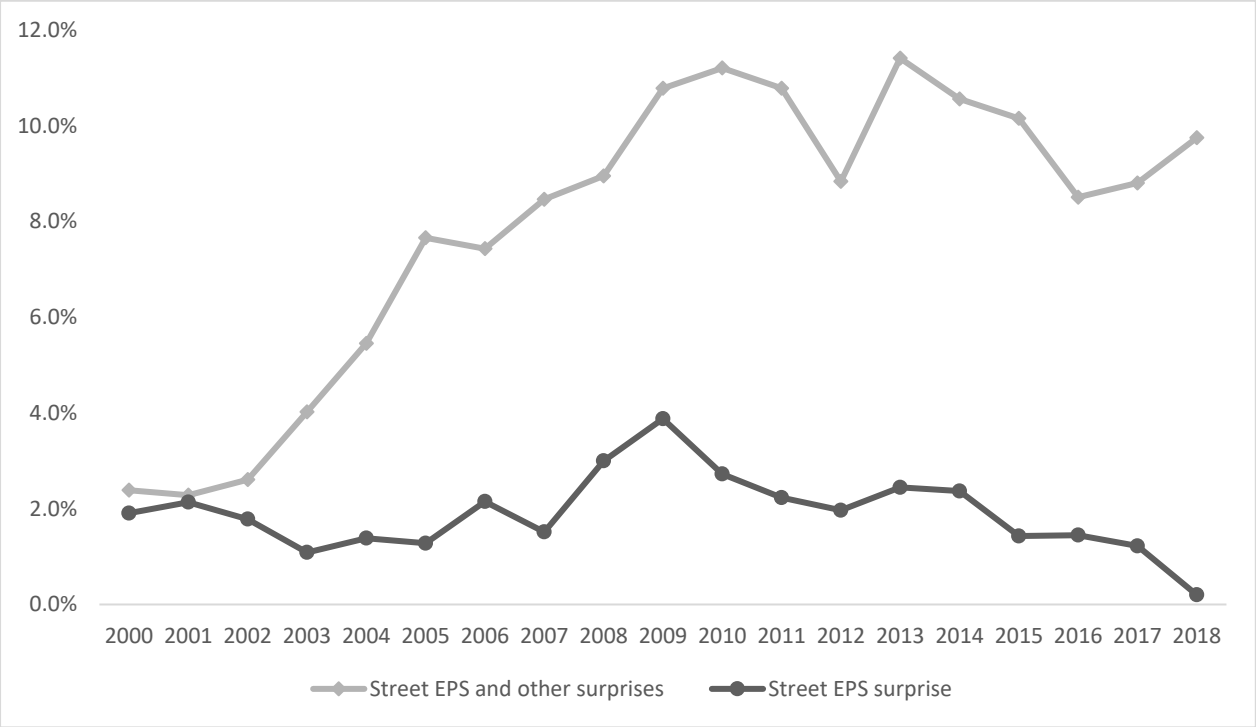
Appendix B The proportion of 'other forecasts' at the analyst-firm-quarter level

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
Panel A: The proportion of analysts issuing at least one 'other forecast' for a firm-year-quarter																				
SAL	16%	19%	34%	55%	66%	68%	70%	71%	76%	79%	84%	86%	86%	85%	86%	88%	88%	87%	85%	70%
NET	0%	0%	16%	43%	62%	66%	67%	68%	71%	73%	78%	78%	75%	74%	76%	77%	78%	77%	75%	61%
GPS	0%	0%	0%	3%	10%	13%	16%	25%	34%	59%	62%	63%	63%	61%	60%	61%	60%	59%	60%	37%
EBT	0%	0%	6%	15%	21%	23%	26%	28%	32%	36%	43%	46%	47%	46%	51%	55%	57%	58%	57%	34%
GRM	0%	0%	0%	0%	0%	0%	14%	35%	36%	37%	37%	36%	34%	30%	32%	33%	32%	31%	30%	22%
CPS	2%	3%	3%	4%	5%	6%	6%	7%	8%	9%	12%	12%	12%	12%	15%	17%	16%	15%	14%	10%
OPR	0%	0%	1%	34%	48%	52%	52%	53%	56%	56%	57%	56%	21%	1%	2%	1%	2%	2%	1%	26%
Panel B: The proportion of all 'other forecasts' issued by an analyst for a firm-quarter as a proportion of issued EPS forecasts																				
SAL	14%	16%	31%	51%	62%	65%	67%	69%	72%	76%	86%	86%	85%	84%	85%	86%	86%	85%	81%	68%
NET	0%	0%	14%	40%	59%	64%	66%	67%	68%	70%	77%	76%	73%	72%	74%	74%	75%	75%	72%	59%
EBT	0%	0%	5%	13%	20%	22%	25%	27%	31%	34%	43%	47%	48%	48%	52%	55%	58%	59%	57%	34%
GPS	0%	0%	0%	2%	9%	12%	15%	23%	30%	53%	57%	58%	58%	55%	55%	55%	55%	55%	54%	34%
GRM	0%	0%	0%	0%	0%	0%	12%	31%	31%	32%	33%	31%	29%	27%	27%	27%	26%	26%	24%	19%
CPS	2%	4%	4%	5%	6%	7%	7%	8%	9%	10%	13%	14%	14%	15%	18%	20%	18%	18%	17%	11%
OPR	0%	0%	1%	30%	46%	50%	50%	51%	53%	52%	54%	52%	18%	1%	1%	1%	1%	2%	1%	24%

Panel A reports the average proportion of analysts issuing 'other forecasts' for a firm-year-quarter expressed as a proportion of analysts issuing EPS forecasts. Panel B reports the number of 'other forecasts' as a proportion of all EPS forecasts issued by an analyst for a firm in a quarter-year.

Appendix C. The adjusted R^2 for regressions with and without 'other surprises'

Figure C1 The evolution of adjusted R^2 for regressions with and without 'other surprises'



The figure reports the adjusted R^2 from year-quarter regressions of price reaction to quarterly earnings announcements on either the street EPS surprise or street EPS and 'other surprises'. The model includes controls from equation 4 and coefficient estimates are averaged per quarter-year.

Appendix D. Concurrent next-quarter EPS and sales guidance surprises for a sample of non-missing guidance firms

	Estimate	p-value
Intercept	0.310	0.000
EPS guidance surprise	0.091	0.022
SAL guidance surprise	0.091	0.026
EPS SU	-0.038	0.431
SAL SU	0.416	0.000
GRM SU	0.054	0.007
EBT SU	1.204	0.000
OPR SU	2.327	0.000
NI SU	1.458	0.000
GPS SU	0.041	0.087
CPS SU	0.301	0.003
Controls	Yes	
Firm effect	Yes	
Year effect	Yes	
Quarter effect	Yes	
N	33,792	
p	0.000	
Adj R2	10.74%	

The table reports results for equation 4 when I include the EPS and sales guidance surprises following Hand et al. (2022). EPS guidance surprise is the price-scaled difference between management guidance for the next quarter EPS and the analyst next-quarter consensus EPS forecast at the time the guidance was issued. SAL guidance surprise is the market capitalization-scaled difference between management sales guidance for next quarter sales and the analyst next-quarter consensus sales forecast at the time the guidance was issued.

Appendix E. Additional tests

Selectivity in 'other forecast' disclosure to I/B/E/S

This section presents additional tests that address the concern that selectivity in 'other forecast' disclosure explains why 'other surprises' show significant association with earnings announcement returns. First, in all analyses, I include firm-fixed effects and year and quarter effects. This research design choice should significantly control for the variation in firm disclosure at earnings announcements that can affect analyst disclosure of 'other forecasts' and price reactions to earnings announcements.

To further address the concern that analysts selectively provide 'other forecasts' and the time-varying firm characteristics correlated with this decision are not accounted for by firm-fixed effects and influence my conclusions, I re-estimate equation 4 for subperiods with a distinct availability of 'other forecasts'. In the period 2000–2010, the availability of 'other forecasts' is lower, thus selectively is more of a concern. In the latter period, 2011–2018, some 'other forecasts' are available for almost all I/B/E/S-covered firms. For example, revenue and net income estimates are available for 96% of firms, thus selectivity is of a lesser concern. The first columns of Table E1 report regression results for the two subperiods. I observe that coefficients are generally higher in the latter sample period where other forecasts are available for more firms, a result inconsistent with the self-selection bias concern. Moreover, the negative coefficient on street EPS surprises in the latter sample period suggests the results are not due to higher investor attention to I/B/E/S covered firms in the latter sample period.[22]

[22] To further exclude the explanation that the main results could reflect higher investor attention centered on certain firms, I repeat equation 4 after including interaction terms between 'other surprises' and the number of analysts following a firm. Higher analyst coverage correlates with higher investor attention (Mola, Rau and Khorana 2013). There is little evidence to suggest that investors react more to 'other surprises' when firm visibility is higher.

Further, I compare coefficients on the operating profit surprise between subperiods 2000–2010 and 2011–2018 since this forecast's availability declines over time, in contrast to other non-street EPS estimates for which availability increases. If my results are attributable to selectivity or time-varying investor attention to 'other forecasts', price reactions to the operating profit surprise should be stronger in the latter sample period as the forecast is more subject to selectivity. The price reaction to the operating profit surprise is stronger in the earlier sample period when the forecast is more widely available (the difference in coefficients is significant at 5%).[23] In sum, addressing the selectivity in the analyst supply of other forecasts leaves the main conclusions unchanged.

Non-linearities and outliers

Previous research highlights that outliers and non-linearities reduce the explanatory power of street EPS surprises. Though all surprises are winsorized, this section presents additional tests to exclude this alternative explanation. First, I use quantile regression for the median (Koenker and Bassett 1978) and present regression results in column 'Quantile regressions.' Quantile regressions are more robust against outliers, non-normal distribution of the data and can detect nonlinear relations between surprises and price reactions. The coefficients on 'other surprises' remain highly significant and the magnitudes are comparable to Table 3 evidence. The coefficient on the street EPS surprise is smaller compared to my main results and only weakly significant.

Second, I use decile transformations of street EPS surprises and 'other surprises', which is a common approach to address outliers and non-linearities (e.g., Bernard and Thomas 1990, Bhushan 1994, Bartov et al., 2000, Dellavigna and Pollet 2009 and Hirshleifer et al., 2009). I continue to find that 'other surprises' remain highly significant in this model as reported in column 'Decile

[23] One could argue that fewer operating forecasts could reflect higher forecasting difficulty for operating profit in the latter sample period. However, an increasing availability of EBIT and EBITDA is inconsistent with this notion as forecasting difficulty should be comparable.

regressions.' Overall, addressing potential non-linearities and outliers in the data continues to show significant associations between 'other surprises' and the variation in stock prices at earnings announcements.

Concurrent analyst forecasts

Francis et al. (2002a) report that analysts frequently revise their forecasts for the next quarter at the earnings announcement date, which can confound the association between street EPS surprises and earnings announcement price reactions. If analyst revisions are more common for firms where analysts also produce 'other forecasts', my results can be subject to this omitted correlated variable. I address this concern by augmenting equation 4 with the mean next-quarter street EPS forecast revision on the earnings announcement day, *Con. Ana. Rev*. The mean revision has a positive association with earnings announcement price reactions, but including it does not change the conclusions.

Firms with high analyst coverage

There is a concern that the significant association between 'other surprises' and earnings announcements returns may be concentrated among firms with lower quality information environment (Francis, Maydew and Sparks 1999; Dhaliwal, Khurana and Pereira 2011). For such firms, investors may rely on a wider range of analyst research outputs than street EPS in evaluating firm performance at earnings announcements. Larger firms tend to have higher analyst following and richer information environment and street EPS may dominate other forecasts as a gauge of firm performance. Consequently, it is important to understand if the results extend to larger firms.

To examine this prediction, I select firms with at least six analysts covering the firm in a year. These tend to be larger companies of higher importance to investors. Column 'At least 6 analysts' in

Table E2 below reports that the coefficient on the street EPS surprise is even smaller in magnitude and highly insignificant in this subsample. The coefficients on 'other surprises' in contrast remain large and significant. This evidence suggests the main results are clearly present among larger and more economically significant companies.

Excluding the street EPS surprise

Bradshaw et al. (2018) highlight that equations that include several surprise measures are nested models where the information in the disaggregating surprise is also included in the street EPS surprise. Though Panel C of Table 2 does not suggest multicollinearity issues, overlapping information sets can inflate coefficients on 'other surprise.' To check robustness of my conclusions to using a unique information set reflected only in 'other surprises', I estimate equation 4 without the street EPS surprise. Column 'Full model without EPS SU' in Table E2 documents that the statistical significance of coefficients on 'other surprises', their magnitudes, and the adjusted R^2 remain virtually the same as in the full model. Thus, the main evidence is consistent with investors valuing the granular earnings information.[24]

Insignificant ERC can be attributable to small magnitudes of street EPS surprises compared to 'other surprises' in recent years, i.e., earnings are easier to anticipate in more recent years reported earnings do not surprise investors. To test this prediction, Figure H1 below reports the absolute magnitudes of the street EPS surprises and, for comparison, of 'other surprises' over time. Like Francis et al. (2002b), I find that the absolute magnitudes of street EPS surprises are relatively stable over time except for the financial crisis period where they are higher. Significant magnitudes of street EPS surprises suggest that analysts cannot easily anticipate firm earnings and that the

[24] In untabulated results, I estimated equation (4) including each surprise measure individually and find the coefficient magnitudes comparable to the main result. Further, the variance inflation factors for the 'Full model' in Table 3 are below two.

forecasting difficulty is relatively stable. The magnitudes of 'other surprises' are initially low, as I assume zero surprises for missing values, but increase over time as the forecasts become available for an increasing number of firms. Thus, my conclusions in Table 3 are not attributable to street EPS surprises being more anticipated in recent years.

Explaining the results in Beaver et al. (2018, 2020)

The results on significant price reactions to 'other surprises' coupled with their increasing availability can help to explain the Beaver et al.'s (2018, 2020) evidence that the magnitude of short-window absolute returns surrounding earnings announcements increased after 2001. This result is not obvious as 'other surprises' may not capture, in a material way, the increase in absolute price reactions. To provide evidence that is directly comparable to Beaver et al.'s (2018, 2020) analyses, Table E3 reports results from a regression that relates squared standardized abnormal returns at quarterly earnings announcements to absolute 'other surprises'. I use Beaver et al.'s (2018) Appendix 1 to create the dependent variable, which is the squared cumulative abnormal return scaled by the standard deviation of daily abnormal returns. I find that price reactions are on average higher for firms where 'other surprises' are available and the economic effect is significant, e.g., a one standard deviation increase in the absolute net income surprise associates with a 2% higher absolute standardized price reaction, a 25% increase compared to the mean.

To nail down the point that 'other surprises' explain higher **absolute** price reactions to earnings announcements, Figure H2 plots the average annual *predicted* squared standardized abnormal returns estimated from the regression model in Table E3. I observe a gradual increase in predicted absolute price reactions starting in 2000, which closely follows Figure 1 in Beaver et al. (2018). Predicted abnormal returns from a model with only the street EPS surprises show little variation over time and do not explain the increase in absolute prices that Beaver et al. (2018, 2020) observe.

Analyst vs. random walk surprises

Investors may have always reacted to surprises constructed from fundamentals even if researchers did not capture this effect. To test this prediction, I examine the incremental effect 'other surprises' have beyond (i) random walk surprises defined as the difference between the current and the previous quarter actual and (ii) seasonally-differenced random walk surprises. I use I/B/E/S actuals to calculate random walk surprises to ensure comparability with analyst surprises and scale the differences by either the stock price for per-share random walk surprises or by the market capitalization for non-per-share measures.

Panel A of Table E4 reports regression results for equation 4 augmented with random walk surprises. The coefficients on the random walk and seasonal random walk surprises are generally insignificant. In contrast, the coefficients on 'other surprises' based on analyst forecasts remain positive. Thus, my conclusions do not reflect previously unreported price reactions to random walk surprises in fundamentals.[25]

Panel B reports equation (4) results with random walk surprises, but not analyst 'other surprises.' The coefficients on the naïve surprises for revenue, gross margin, EBITDA, and net income are significant when included without analyst surprises. This evidence suggests that not controlling for analyst surprises would show these naïve surprises correlating with returns. However, naïve surprises lose explanatory power controlling for surprises constructed from analyst forecasts. The adjusted R2 in Panel B is also smaller than for the models in Panel A.

Finally, in untabulated result, I perform four additional tests. First, I recalculate the surprise measures (i) in percentage terms (Bamber 1987) and (ii) by scaling them by the standard deviation of

[25] In untabulated tests, I also repeated Table 7 regressions for the first quarterly earnings announcement following an 'other forecast' initiation for a firm, which is similar to the setting in column 'First SU' in Table 6. This test helps to address if analysts report 'other surprise' in response to an increase in the informativeness of firm fundamentals and it is the latter that explains my results. If this is the case, random walk surprises should show a positive association with earnings announcements returns for this sample, but I find no evidence to support this conjecture.

quarterly forecasts (Kama 2009) and find consistent evidence. Second, I find that the conclusions are unchanged when I recalculate the dependent variable, CAR, as abnormal returns based on the market-model adjusted returns and the Carhart (1997) model. I perform this test because firms for which 'other forecasts' are available may be characterized by higher betas and using market-adjusted returns may falsely indicate higher price reactions. Thus, the way the surprises and abnormal returns are calculated does not affect the results.

Third, to reinforce the point that my results are not driven by a differential availability of 'other forecasts' or by a differential forecasting effort across the eight forecasts, I only select observations with non-missing values for the eight forecasts and re-estimate equation 4 for this subsample. Excluding 'other forecasts' produces a significant coefficient on the street EPS surprise of 0.301 and adjusted R^2 of 1.74%. When included in the model, the coefficients on 'other surprises' are all highly significant and higher in magnitude than in Table 3, the adjusted R^2 increases to 10.51%, and the coefficient on street EPS loses the positive association with price reactions.

Fourth, I perform a falsification test. Specifically, Akbas, Markov, Subasi and Weisbrod (2018) report that I/B/E/S may delay the release of the actual value due to earnings results processing difficulty and limited investor attention. If the actual value is released by I/B/E/S with a lag, 'other surprises' are noisy since investors substitute information directly from the earnings announcement for the missing I/B/E/S actual. Noisy surprises should associate with smaller price reactions. I identify delays in the I/B/E/S actual release for 'other surprises' by comparing the I/B/E/S activation date for the actual with the I/B/E/S actual announcement date. If the two dates do not coincide, the actual was disclosed after the earnings announcement (Akbas, Markov, Subasi and Weisbrod 2018). I find weaker price reactions to 'other surprises' when the actual was released by I/B/E/S with a lag. Because I keep the information set constant, but vary when the information is released to investors, the test helps to exclude the alternative explanation that the

results are attributable to more granular firm disclosures at earnings announcements (Francis et al. 2002b). In sum, additional tests reinforce the main conclusions.

Table E1 Additional results

	Before 2010		After 2010		Quantile regressions		Decile regressions		Concurrent analyst revisions	
	Est	p	Est	p	Est	p	Est	p	Est	p
Intercept	0.183	0.001	0.258	0.000	-0.001	0.000	0.042	0.002	0.154	0.000
EPS SU	0.073	0.003	-0.063	0.015	0.010	0.092	0.003	0.000	0.022	0.257
SAL SU	0.353	0.000	0.430	0.000	0.323	0.000	0.004	0.000	0.383	0.000
GRM SU	0.062	0.008	0.073	0.000	0.062	0.000	0.002	0.000	0.068	0.000
EBT SU	0.758	0.000	1.803	0.000	1.305	0.000	0.002	0.000	1.427	0.000
OPR SU	1.723	0.000	0.636	0.015	1.073	0.000	0.001	0.000	1.073	0.000
NI SU	0.579	0.000	1.107	0.000	0.822	0.000	0.001	0.000	0.796	0.000
GPS SU	0.007	0.713	0.066	0.001	0.036	0.000	0.001	0.000	0.023	0.064
CPS SU	0.254	0.005	0.367	0.000	0.350	0.000	0.001	0.000	0.365	0.000
EBI SU										
PRE-TAX SU										
Con. ana. rev									0.084	0.000
Controls	Yes		Yes		Yes		Yes		Yes	
Firm effect	Yes		Yes		Yes		Yes		Yes	
Year effect	Yes		Yes		Yes		Yes		Yes	
Quarter effect	Yes		Yes		Yes		Yes		Yes	
N	80,941		96,013		176,954		176,954		176,954	
p	0.000		0.000		0.000		0.000		0.000	
Adj. R^2	7.98%		16.35%		3.10%		15.11%		11.20%	

The table reports results for equation 4, which regresses price reactions to quarterly earnings surprises on the street EPS surprise and 'other surprises.'

Table E2 Robustness tests: **Panel A: Firms with high analyst coverage and a model without the street EPS surprise**

	At least 6 analysts		Full model without EPS SU	
	Estimate	p	Estimate	p
Intercept	0.000	0.946	0.000	0.980
EPS SU	0.009	0.739		
SAL SU	0.364	0.000	0.379	0.000
GRM SU	0.063	0.000	0.067	0.000
EBT SU	1.318	0.000	1.359	0.000
OPR SU	1.182	0.000	1.139	0.000
NI SU	0.924	0.000	0.841	0.000
GPS SU	0.032	0.080	0.034	0.000
CPS SU	0.357	0.000	0.358	0.000
Controls	Yes		Yes	
Firm effect	Yes		Yes	
Year effect	Yes		Yes	
Quarter effect	Yes		Yes	
N	127,300		176,954	
p	0.000		0.000	
Adj R^2	6.66%		6.54%	

The table reports equation 4 regression results for firms with high analyst coverage and when I exclude the street EPS surprise.

Table E3. Price reactions to squared abnormal returns at quarterly earnings announcements

	Estimate	p-value	Estimate	ME	p-value
Intercept	0.213	0.014	0.148		0.134
|EPS SU|	0.217	0.000	0.087	1.1%	0.111
|SAL SU|			0.367	1.5%	0.007
|GRM SU|			-0.011	-0.1%	0.656
|EBT SU|			1.277	1.6%	0.016
|OPR SU|			-0.310	-0.3%	0.379
|NI SU|			0.898	2.0%	0.077
|GPS SU|			0.075	0.8%	0.095
|CPS SU|			-0.013	0.0%	0.956
Controls	Yes		Yes		
Firm effect	Yes		Yes		
Year effect	Yes		Yes		
Quarter effect	Yes		Yes		
N	176,954		176,954		
p	0.000		0.000		
Adj. R^2	6.12%		7.27%		

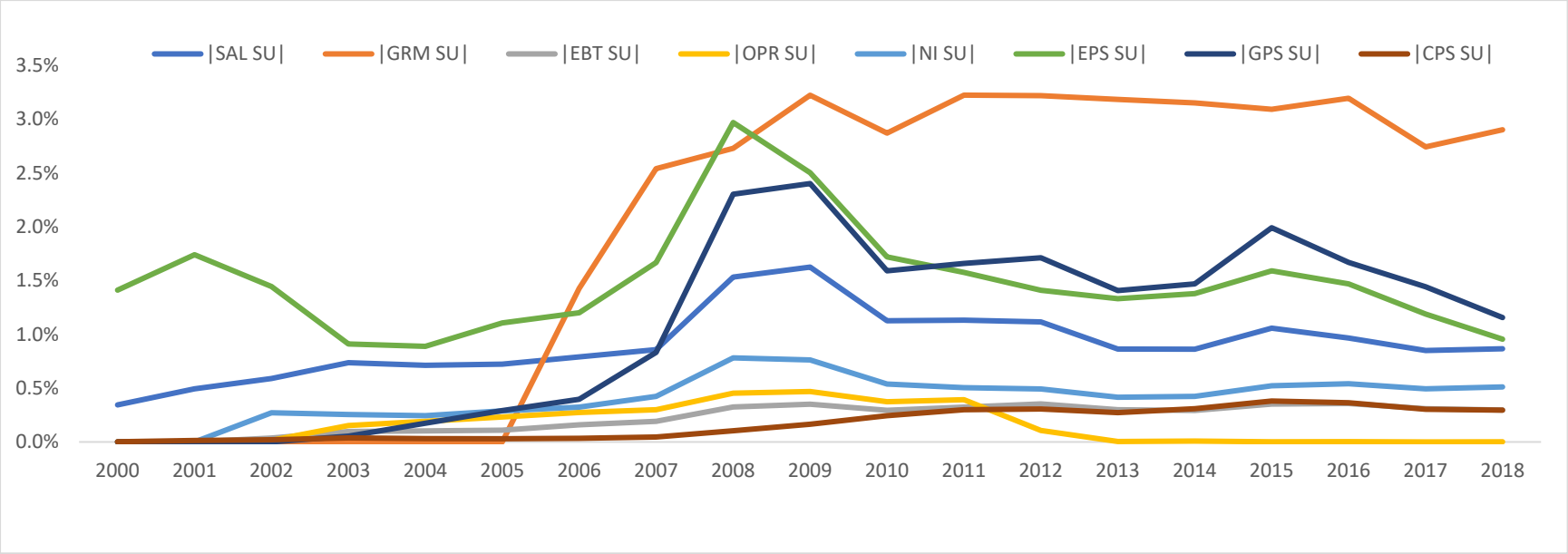
The table reports the result from a regression that relates squared standardized abnormal returns at quarterly earnings announcements to the absolute street EPS and absolute 'other surprises'.

Table E4 Random walk and seasonal random walk surprises

	Random walk		Seasonal random walk	
	Estimate	p	Estimate	p
Panel A Random walks surprises				
Intercept	0.149	0.000	0.153	0.000
EPS SU	0.028	0.166	0.030	0.122
SAL SU	0.383	0.000	0.393	0.000
GRM SU	0.070	0.000	0.070	0.000
EBT SU	1.463	0.000	1.461	0.000
OPR SU	1.125	0.000	1.126	0.000
NI SU	0.832	0.000	0.833	0.000
GPS SU	0.025	0.040	0.023	0.070
CPS SU	0.382	0.000	0.380	0.000
EPS SU Naïve	0.000	0.460	0.000	0.216
SAL SU Naïve	0.006	0.002	0.000	0.994
GRM SU Naïve	0.000	0.997	-0.001	0.230
EBT SU Naïve	0.004	0.376	0.028	0.153
OPR SU Naïve	-0.006	0.326	-0.004	0.854
NI SU Naïve	0.001	0.586	-0.007	0.020
GPS SU Naïve	0.000	0.383	0.000	0.261
CPS SU Naïve	0.000	0.156	0.000	0.949
Controls	Yes		Yes	
Firm effect	Yes		Yes	
Year effect	Yes		Yes	
Quarter effect	Yes		Yes	
N	176,954		176,954	
p	0.000		0.000	
Adj. R^2	8.96%		8.98%	
Panel B Including only naïve surprises				
	Random Walk		Seasonal Random Walk	
	Estimate	p-value	Estimate	p-value
Intercept	0.146	0.000	0.142	0.000
EPS SU Naïve	0.000	0.551	0.000	0.462
SAL SU Naïve	0.014	0.022	0.011	0.029
GRM SU Naïve	0.004	0.006	0.003	0.008
EBT SU Naïve	0.015	0.084	0.040	0.039
OPR SU Naïve	-0.003	0.515	0.004	0.181
NI SU Naïve	0.008	0.008	0.023	0.015
GPS SU Naïve	0.000	0.516	0.000	0.532
CPS SU Naïve	0.000	0.708	0.000	0.950
Controls	Yes		Yes	
Firm effect	Yes		Yes	
Year effect	Yes		Yes	
Quarter effect	Yes		Yes	
N	176,954		176,954	
p	0.000		0.000	
R2	6.75%		6.86%	

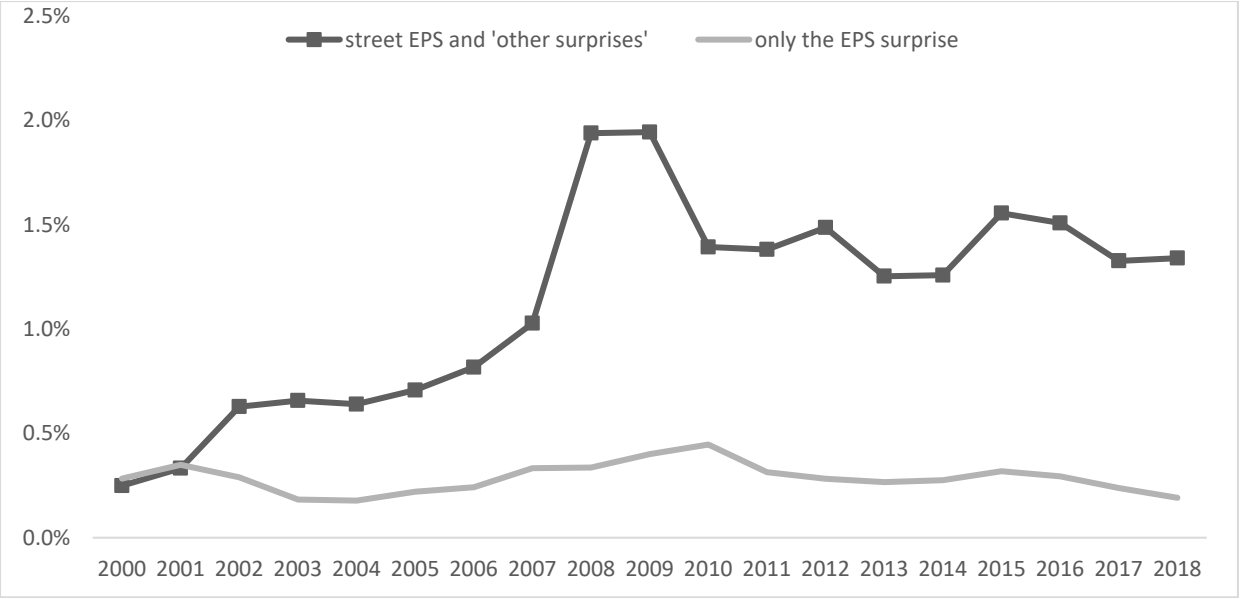
Panel A reports equation 4 regression results augmented with random walk and seasonal random walk surprises. Panel B reports equation 4 regression results augmented with random walk and seasonal random walk surprises but without analyst 'other surprises.'

Figure E1. Average absolute magnitudes of street EPS surprises and of 'other surprises' over time



The table reports the absolute magnitudes of street EPS surprises (EPS SU) and of 'other surprises' as defined in equations 1–3. The 'other surprises' include the revenue surprise (SAL SU), the net income surprise (NI SU), the GAAP EPS surprise (GPS SU), the EBITDA surprise (EBT SU), the gross margin surprise (GRM SU), the operating profit surprise (OPR SU) and the cash flow surprise (CPS SU).

Figure E2. Average predicted absolute price reactions



The figure reports the average annual predicted squared standardized abnormal returns at quarterly earnings announcements.

Appendix F. Explaining the differences in results between this study and Hand et al. (2022).

I. The persistence of the street EPS surprise compared to the net income surprise

To understand why the street EPS surprise is not significant in the main regression, I first examine if excluding the net income surprises will make the coefficient on the street EPS surprise significant. Hand et al. (2022) do not include the net income surprise in their model and the differences in model specification may be the reason. Table F1, reports regression results for equation (4) without the net income surprise. The street EPS surprise becomes significant when I do not control for the net income surprise.

To understand why the street EPS surprise loses explanatory power when I include just the net income surprise, I examine the power of the net income and of the street EPS surprise to predict future street EPS surprises. Ex-ante, I expect today's street EPS surprises to be a better predictor of future street EPS surprises than today's net income surprise. I/B/E/S defines net income as 'corporation's after-tax income' thus the measure includes transitory items that should reduce the predictive ability of net income surprises for future street EPS surprises. However, the net income surprise could associate more strongly with earnings announcement returns than the street EPS surprise if net income surprises are more persistent, i.e., they are a better predictor of future earnings surprises. For example, analysts may exclude persistent components in calculating street EPS forecasts, which they include in net income forecasts; in this case, net income surprises will have a stronger predictive power for future street EPS surprises.

The regression model I use has the form:

$$\%EPS\ SU_{i,q+1,y}$$

$$= \theta_0 + \theta_1 \%EPS\ SU_{i,q,y} + \theta_2 \%NI\ SU_{i,q,y} + Controls + \vartheta_i + \omega_y + \varphi_q + u_{i,q,y}. \quad (7)$$

I use percentage surprise measures to allow for more comparability in coefficients θ_1 and θ_2. I use the same controls as in equation 4 and the model includes firm-fixed effects and year- and quarter effects. I dual-cluster regression standard errors by firm and year.

The first columns of Table F2 report a significant coefficient on the current quarter percentage street EPS surprise when this is the only surprise measure in equation 7. The coefficient on the current quarter percentage street EPS surprise is 0.367, which is similar in magnitude to Livnat's (2003) coefficient of 0.349. Column 'Full model' indicates that after including the current quarter percentage net income surprise, the coefficient on the current percentage street EPS surprise almost halves to 0.202 (F-test for the difference in coefficients is 4.98, p-value 0.019) and is only marginally significant (p-value of 0.100). The coefficient on the percentage net income surprise is significant at the 5% level. The economic magnitude of the net income surprise is also larger: a one standard deviation increase in the current quarter percentage net income surprise associates with a 1.6 higher future percentage street EPS surprise compared to the mean. A one standard deviation increase in the current quarter percentage street EPS surprise associates with a 1.05 higher future percentage street EPS surprise.

Next, I examine whether the street EPS surprise gains explanatory power as the street EPS forecast excludes fewer non-transitory items (Black and Christensen, 2009; Doyle et al., 2013). Specifically, I follow Bradshaw et al. (2018) and calculate non-transitory items excluded from the calculation of street EPS estimates as the absolute difference between Compustat operating EPS and the I/B/E/S street EPS actual, which I then scale by one plus the absolute Compustat operating EPS. I then rank firms into quartiles and create an indicator variable for the lowest quartile, which

includes firms where Compustat operating EPS and I/B/E/S street EPS forecasts are most aligned, *Aligned*. The interaction term between the street EPS surprise and the indicator for few non-transitory exclusions is significantly positive. This result is consistent with higher persistence of street EPS surprises less likely to be distorted by subjective or erroneous recurring items exclusions. The interaction term between *Aligned* and the net income surprise is not significant.

Table 6 suggests that 'other surprises' are useful in interpreting quality of the street EPS surprise. The street EPS surprise is likely to be of lower quality when firms use share repurchases. Hribar et al. (2006) and Almeida et al. (2016) report that firms use share repurchases to avoid missing analysts' earnings expectations and mitigate the consequent negative stock price response. Using repurchases as a form of earnings management will reduce persistence of street EPS surprises compared to non-per-share surprises, such as the net income surprise, which is not affected by share repurchases. The net income surprise can help to disentangle cases where firms meet analyst street EPS expectations through share buybacks. To test this prediction, I include interaction terms between street EPS and net income surprises and the declared percentage number of shares a company intends to repurchase disclosed at the repurchase announcement made over the previous 12 months, *Repurchase*. I set *Repurchase* to zero if a firm did not announce a buyback over the previous 12 months. The predictive power of street EPS surprises is significantly lower when companies announce significant repurchase programs. The predictive power of net income surprises is not affected by repurchase programs. These results are consistent with hypothesis 4 and complement Table 6 evidence. This result is also consistent with on average higher coefficients on non-per-share surprises documented in Panel B of Table 4.

II. The effect of sample selection

To better understand how selectivity in the sample can affect the results, I first analyze the differences in characteristics between firms with and without guidance. I focus on guidance as it is available for only 9% of firms that have street EPS surprises (Hand et al. 2022, Table 2) and Hand et al. (2022) find guidance is among the most important surprises to explain earnings announcement returns. Appendix F, Table F3, shows that guidance firms have more positive street EPS and 'other surprises', higher profitability, higher analyst following and institutional ownership. Guidance firms also have higher market capitalization, lower book-to-market ratio and accruals, higher leverage and larger dividend payouts, and lower institutional concentration. These results suggest that guidance firms are financially well-performing and with better prospects. This sample composition has implications for the type of information investors are likely to use to interpret quarterly results. Specifically, for guidance, bottom-line accounting information such as EPS is likely more informative about the firm's current and future performance. Thus, investors rationally attach more weight to the street EPS surprise. In contrast, the sample of no-guidance firms includes poorly performing firms with lower earnings quality captured by higher accruals. For such firms, top-line surprises should be more useful in interpreting firm results.

To follow up on this logic, I present regression results in Table F4, where I include an interaction term between the surprises and an indicator variable for a firm disclosing next quarter guidance at quarterly earnings announcements. The interaction terms for the street EPS surprise and the net income surprise are positive, consistent with investors attaching more weight to the bottom-line accounting surprises. In contrast, the interaction on the revenue surprise is negative, consistent with lower relevance of top-line accounting surprises for guidance firms.

III. The effect of using detail analyst forecasts compared to summary files to calculate the street EPS surprise

To understand the impact of using summary compared to detailed files in calculating the street EPS surprise, I augment equation (4) with the summary street EPS surprise from I/B/E/S. Table F5 reports the regression results. I find that the summary street EPS surprise shows a significant positive coefficient when included with the detailed street EPS surprise, which is not significant.

Table F1. Excluding the net income surprise

	Without net income	
	Estimate	p-value
Intercept	0.154	0.000
EPS SU	0.079	0.000
SAL SU	0.420	0.000
GRM SU	0.077	0.000
EBT SU	1.722	0.000
OPR SU	1.544	0.000
NI SU		
GPS SU	0.051	0.000
CPS SU	0.391	0.000
EPS SU Summary		
Controls	Yes	
Firm effect	Yes	
Year effect	Yes	
Quarter effect	Yes	
N	176,954	
p	0.000	
Adj R2	8.46%	

The table reports equation 4 regression results excluding the net income surprise.

Table F2. Future Street EPS surprises

	Only EPS SU%		Full model		Interactions	
	Estimate	p	Estimate	p	Estimate	p
Intercept	0.660	0.005	0.637	0.006	0.639	0.006
EPS SU%	0.367	0.004	0.202	0.100	0.142	0.288
NI SU%			0.047	0.043	0.063	0.000
EPS SU% × Aligned					0.654	0.067
NI SU% × Aligned					-0.134	0.356
Aligned					-0.010	0.527
EPS SU% × Repurchase					-2.648	0.023
NI SU% × Repurchase					0.368	0.509
Repurchase					-0.243	0.115
Controls	Yes		Yes		Yes	
Firm effect	Yes		Yes		Yes	
Year effect	Yes		Yes		Yes	
Quarter effect	Yes		Yes		Yes	
N	160,910		160,910		160,910	
p	0.000		0.000		0.000	
Adj R^2	2.73%		2.75%		2.76%	

The table presents equation 7 regression results, which relate the percentage future street EPS surprises to current percentage street EPS and net income surprises. Aligned is an indicator variable for the bottom tercile of stocks where Compustat operating EPS and I/B/E/S street EPS are most aligned. Repurchase measures the declared percentage number of shares a company intends to repurchase disclosed at the repurchase announcement made over the previous 12 months; if a firm did not announce a repurchase program, the value is set to zero. Controls are from equation 4.

Table F3. Characteristics of firms with and without guidance

	No guidance	Guidance	Differences in means	
	Mean	Mean	Difference	t-test
EPS SU	-0.54%	-0.01%	-0.54%	-20.02
SAL SU	-0.03%	0.13%	-0.16%	-16.79
GRM SU	-0.44%	-0.29%	-0.15%	-5.87
EBT SU	-0.03%	0.03%	-0.06%	-23
OPR SU	-0.01%	0.04%	-0.05%	-22.71
NI SU	-0.08%	0.06%	-0.13%	-28.41
GPS SU	-0.63%	-0.45%	-0.18%	-8.6
CPS SU	0.00%	0.01%	-0.01%	-2.19
#Analysts following	7.561	11.085	-3.524	-112.55
ln MV	13.422	14.311	-0.888	-115.36
B/M	0.638	0.523	0.115	54.48
ROA	0.016	0.123	-0.107	-119.7
Accruals	0.064	0.061	0.003	6.29
Leverage	0.205	0.225	-0.020	-20.66
Dividend payout ratio	0.203	0.206	-0.003	-1.42
Institutional ownership	0.489	0.653	-0.164	-108.98
Institutional concentration	0.086	0.060	0.027	58.26

The table reports characteristics for firms without and without guidance.

Table F4. Interactions between accounting surprises and an indicator for the availability of next quarter guidance.

	Estimate	p
Intercept	0.150	0.000
EPS SU * Guidance_D	0.058	0.042
SAL SU* Guidance_D	-0.135	0.002
GRM SU* Guidance_D	-0.009	0.443
EBT SU* Guidance_D	-0.102	0.471
OPR SU* Guidance_D	0.249	0.301
NI SU* Guidance_D	0.798	0.000
GPS SU* Guidance_D	0.006	0.862
CPS SU* Guidance_D	-0.063	0.259
Guidance_D	0.002	0.082
EPS SU	0.029	0.116
SAL SU	0.427	0.000
GRM SU	0.072	0.000
EBT SU	1.469	0.000
OPR SU	1.079	0.000
NI SU	0.711	0.000
GPS SU	0.027	0.036
CPS SU	0.398	0.000
Controls	Yes	
Firm effect	Yes	
Year effect	Yes	
Quarter effect	Yes	
N	176,956	
p	0.000	
Adj. R^2	9.06%	

The table reports equation (5) regression results with interaction terms between accounting surprises and an indicator variable for a firm disclosing next quarter guidance at quarterly announcements, Guidance_D.

Table F5. Including the summary Street EPS surprise

	Estimate	p-value
Intercept	0.153	0.000
EPS SU	0.000	0.977
SAL SU	0.378	0.000
GRM SU	0.067	0.000
EBT SU	1.390	0.000
OPR SU	1.040	0.000
NI SU	0.616	0.000
GPS SU	0.031	0.009
CPS SU	0.377	0.000
EPS SU Summary	0.001	0.000
Controls	Yes	
Firm effect	Yes	
Year effect	Yes	
Quarter effect	Yes	
N	176,954	
p	0.000	
Adj R2	9.93%	

The table reports equation 4 regression results excluding the net income surprise and when I include the summary street EPS surprise, EPS SU Summary.

Table 1 The frequency of at least one quarterly forecast on I/B/E/S for a firm in a year

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
SAL	26%	36%	53%	76%	84%	85%	88%	89%	92%	93%	95%	96%	97%	96%	97%	97%	97%	96%	97%	84%
NI	0%	0%	37%	71%	79%	84%	85%	87%	89%	89%	93%	95%	95%	96%	96%	97%	96%	95%	96%	78%
PRE	0%	0%	26%	55%	66%	70%	74%	75%	75%	77%	79%	85%	85%	85%	83%	84%	84%	84%	84%	67%
GPS	0%	0%	0%	5%	16%	23%	33%	49%	60%	84%	88%	90%	91%	90%	91%	92%	90%	89%	90%	57%
EBT	0%	0%	6%	18%	25%	29%	40%	44%	47%	51%	58%	65%	68%	69%	69%	71%	71%	71%	70%	46%
EBI	0%	0%	1%	10%	13%	15%	17%	16%	18%	24%	36%	51%	80%	86%	87%	87%	86%	85%	86%	42%
GRM	0%	0%	0%	0%	0%	0%	25%	47%	46%	48%	49%	55%	55%	54%	51%	49%	49%	47%	48%	33%
OPR	0%	0%	3%	41%	53%	60%	64%	65%	65%	66%	68%	75%	20%	1%	2%	1%	0%	0%	0%	31%
NAV	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	46%	47%	47%	45%	47%	46%	40%	41%	21%
CPX	0%	0%	0%	0%	0%	0%	4%	13%	15%	20%	28%	35%	37%	38%	37%	37%	36%	35%	34%	19%
BPS	0%	0%	2%	11%	15%	16%	17%	16%	18%	22%	24%	28%	28%	28%	26%	28%	28%	26%	28%	19%
CPS	1%	2%	3%	4%	5%	6%	6%	9%	11%	15%	22%	26%	26%	26%	30%	33%	33%	30%	28%	17%
ROE	0%	0%	1%	9%	13%	15%	16%	15%	16%	18%	17%	19%	20%	22%	21%	21%	21%	20%	19%	15%
DPS	0%	0%	3%	6%	8%	6%	9%	10%	11%	9%	11%	14%	17%	19%	19%	19%	20%	20%	19%	12%
NDT	0%	0%	0%	2%	3%	3%	3%	4%	6%	11%	14%	17%	18%	17%	17%	19%	21%	19%	21%	10%
ROA	0%	0%	1%	6%	8%	9%	8%	8%	7%	9%	9%	10%	11%	12%	11%	12%	12%	12%	12%	8%
FFO	3%	3%	3%	4%	4%	4%	3%	3%	3%	3%	3%	4%	4%	4%	5%	5%	5%	5%	5%	4%
EBS	0%	0%	0%	0%	0%	1%	2%	3%	3%	4%	5%	6%	5%	5%	8%	9%	8%	8%	6%	4%
EBG	0%	1%	28%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
ENT	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%
CSH	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

The table reports the annual proportion of quarterly non-street EPS forecasts available on I/B/E/S over the fiscal years 2000-2018 expressed as a proportion of I/B/E/S covered firms with at least one street EPS estimate. The sample includes forecasts for revenue (SAL), net income (NI), pre-tax profit (PRE), GAAP EPS (GPS), EBITDA (EBT), EBIT (EBI), gross margin (GRM), operating profit (OPR), net asset value (NAV), capex (CPX), book value per share (BPS), cash flow per share (CPS), return on equity (ROE), dividend per share (DPS), net debt (NDT), return on assets (ROA), funds from operations per share (FFO), EBITDA per share (EBS), EPS before goodwill (EBG), Enterprise Value (ENT), and Cash Earnings per share (CSH). The sample period includes fiscal years 2000-2018.

Table 2 Descriptive statistics for street EPS and 'other surprises'

	Mean	Median	Std Dev	Lower Quartile	Upper Quartile
Panel A: Descriptive statistics for the street EPS surprise and 'other surprises'					
EPS SU	-0.265%	0.042%	5.692%	-0.065%	0.215%
SAL SU	0.059%	0.064%	2.388%	-0.270%	0.497%
GRM SU	-1.936%	0.116%	15.888%	-2.659%	2.591%
EBT SU	-0.036%	0.041%	1.170%	-0.179%	0.270%
OPR SU	0.004%	0.059%	1.209%	-0.161%	0.311%
NI SU	-0.025%	0.052%	1.347%	-0.084%	0.236%
GPS SU	-1.488%	0.012%	11.751%	-0.296%	0.220%
CPS SU	-0.036%	0.059%	5.426%	-0.665%	0.781%
Panel B: Accuracy of analyst forecasts compared to random walk forecasts					
	Mean analyst forecast	Mean random walk forecast	Difference	% difference	p-value
EPS FE	1.16%	2.85%	-1.69%	-59.19%	0.000
SAL FE	6.98%	7.63%	-0.65%	-8.51%	0.000
GRM FE	0.59%	1.22%	-0.64%	-52.18%	0.000
EBT FE	0.61%	1.25%	-0.64%	-51.05%	0.000
OPR FE	0.58%	1.04%	-0.47%	-44.75%	0.000
NI FE	1.51%	2.23%	-0.72%	-32.44%	0.000
GPS FE	2.85%	3.97%	-1.13%	-28.34%	0.000
CPS FE	2.29%	3.56%	-1.27%	-35.66%	0.000
	Median analyst forecast	Median random walk forecast	Difference	% difference	p-value
EPS FE	0.39%	0.94%	-0.55%	-58.25%	0.000
SAL FE	2.62%	3.24%	-0.62%	-19.08%	0.000
GRM FE	0.23%	0.51%	-0.28%	-55.25%	0.000
EBT FE	0.25%	0.51%	-0.26%	-51.52%	0.000
OPR FE	0.17%	0.36%	-0.19%	-52.03%	0.000
NI FE	0.15%	0.35%	-0.20%	-56.33%	0.000
GPS FE	0.25%	0.51%	-0.26%	-51.11%	0.000
CPS FE	0.72%	1.13%	-0.41%	-36.06%	0.000

Table 2, continued.

Panel C: Pearson correlations

	SAL SU	GRM SU	EBT SU	OPR SU	NI SU	GPS SU	CPS SU
GRM SU	0.069						
	0.000						
EBT SU	0.296	0.324					
	0.000	0.000					
OPR SU	0.305	0.377	0.830				
	0.000	0.000	0.000				
NI SU	0.244	0.296	0.621	0.770			
	0.000	0.000	0.000	0.000			
GPS SU	0.151	0.152	0.274	0.335	0.420		
	0.000	0.000	0.000	0.000	0.000		
CPS SU	0.067	0.061	0.105	0.081	0.104	0.060	
	0.000	0.000	0.000	0.000	0.000	0.000	
EPS SU	0.145	0.201	0.407	0.457	0.618	0.667	0.145
	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Panel A reports descriptive statistics for street EPS surprises and 'other surprises' calculated as the scaled difference between the actual and the analyst consensus forecast as described in equations 1–3. The 'other surprises' are based on forecasts for revenue (SAL), net income (NI), GAAP EPS (GPS), EBITDA (EBT), gross margin (GRM), operating profit (OPR) and cash flow (CPS). Panel B reports the mean and median errors of analyst 'other forecasts' compared to random walk forecasts where the errors are calculated as the absolute scaled difference between the actual value and the consensus forecast and I use similar scaling as when calculating the surprises. Panel C reports the Pearson correlations between the surprises.

Table 3 Regression results for price reactions to quarterly earnings announcements

	Basic specification			Full model without firm-fixed effects			Full model with firm fixed effects			Guidance	
	Estimate	ME	p-value	Estimate	ME	p-value	Estimate	ME	p-value	Estimate	p-value
Panel A Price reaction regressions											
Intercept	-0.006		0.306	-0.003		0.611	0.149		0.000	0.152	0.000
EPS SU	0.168	11.1%	0.000	0.033	2.2%	0.119	0.028	1.8%	0.165	0.028	0.157
SAL SU				0.382	8.8%	0.000	0.391	9.1%	0.000	0.388	0.000
GRM SU				0.067	4.4%	0.000	0.070	4.6%	0.000	0.070	0.000
EBT SU				1.375	9.2%	0.000	1.466	9.8%	0.000	1.469	0.000
OPR SU				1.129	5.9%	0.000	1.117	5.8%	0.000	1.122	0.000
NI SU				0.770	9.0%	0.000	0.835	9.8%	0.000	0.832	0.000
GPS SU				0.020	1.0%	0.136	0.025	1.3%	0.040	0.025	0.048
CPS SU				0.360	2.6%	0.000	0.381	2.8%	0.000	0.377	0.000
EPS guidance surprise										0.045	0.314
SAL guidance surprise										-0.004	0.788
Controls	Yes			Yes			Yes			Yes	
Firm effect	No			No			Yes			Yes	
Year effect	Yes			Yes			Yes			Yes	
Quarter effect	Yes			Yes			Yes			Yes	
N	176,954			176,954			176,954			176,954	
p	0.000			0.000			0.000			0.000	
Adj R2	1.61%			6.57%			8.96%			8.95%	

Panel B Time-series standardized coefficient estimates

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Average other non-per-share surprises	0.02	0.01	0.04	0.07	0.08	0.10	0.10	0.11	0.10	0.10	0.12	0.11	0.11	0.12	0.11	0.12	0.10	0.11	0.12
Average other per-share surprises	0.01	0.01	0.01	0.01	-0.01	0.01	0.01	0.00	0.02	0.02	0.04	0.04	0.04	0.02	0.04	0.05	0.06	0.05	0.03

Panel A reports equation 4 regression results that relate price reactions to quarterly earnings news to the street EPS surprise (EPS SU), the revenue surprise (SAL SU), the net income surprise (NI SU), the GAAP EPS surprise (GPS SU), the EBITDA surprise (EBT SU), the gross margin surprise (GRM SU), the operating profit surprise (OPR SU) and the cash flow surprise (CPS SU). Column 'ME' reports coefficients for variables standardized to mean of zero and unit standard deviation. Panel B reports average annual coefficients from equation 4 regression where I average coefficients by year-quarter and standardize the variables to mean of zero and unit standard deviation. Average other non-per-share surprises include SAL SU, EBT SU, GRM SU, OPR SU and NI SU. Average other per-share surprises include GPS SU and CPS SU.

Table 4 When are 'other surprises' most useful to investors: firm characteristics

	X=Small EPS SU		X= High accruals indicator		X=B/M	
	Estimate	p	Estimate	p	Estimate	p
Intercept	0.117	0.000	0.149	0.000	0.155	0.000
EPS SU	0.048	0.000	0.041	0.076	-0.018	0.409
SAL SU	0.276	0.000	0.356	0.000	0.645	0.000
GRM SU	0.052	0.000	0.077	0.000	0.091	0.000
EBT SU	0.932	0.000	1.551	0.000	2.004	0.000
OPR SU	0.334	0.006	1.274	0.000	1.553	0.000
NI SU	0.264	0.001	1.085	0.000	0.972	0.000
GPS SU	0.019	0.060	0.014	0.435	-0.002	0.920
CPS SU	0.377	0.000	0.302	0.000	0.457	0.000
EPS SU × X	-0.115	0.025	-0.021	0.269	0.051	0.000
SAL SU × X	0.121	0.000	0.076	0.015	-0.250	0.000
GRM SU × X	0.009	0.346	-0.017	0.132	-0.033	0.000
EBT SU × X	0.427	0.001	-0.150	0.227	-0.585	0.000
OPR SU × X	0.765	0.000	-0.312	0.036	-0.546	0.022
NI SU × X	0.507	0.008	-0.474	0.000	-0.149	0.023
GPS SU × X	0.061	0.000	0.016	0.508	0.031	0.008
CPS SU × X	-0.065	0.401	0.173	0.066	-0.083	0.247
X	0.039	0.000	0.002	0.027	0.006	0.003
Controls	Yes		Yes		Yes	
Firm effect	Yes		Yes		Yes	
Year effect	Yes		Yes		Yes	
Quarter effect	Yes		Yes		Yes	
N	176,956		176,956		176,956	
p	0.000		0.000		0.000	
Adj. R^2	15.97%		12.61%		12.56%	

The table reports equation 5 regression results with interaction terms between 'other surprises' and (i) an indicator variable for zero or small positive street EPS surprises, X=Small EPS SU, (ii), an indicator variable for firms in the top total accruals tercile based on annual rankings on accruals, X= High accruals indicator, and (iii), the book-to-market ratio, X=B/M.

Table 5 When are 'other surprises' most useful to investors: institutional ownership

	Institutional ownership		Active and passive IO		Blockholders	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	0.152	0.000	0.173	0.000	0.171	0.000
EPS SU*IO	-0.003	0.924				
SAL SU* IO	0.143	0.013				
GRM SU* IO	0.017	0.242				
EBT SU* IO	0.412	0.120				
OPR SU* IO	0.617	0.036				
NI SU* IO	0.707	0.000				
GPS SU* IO	0.034	0.051				
CPS SU* IO	0.099	0.422				
EPS SU*IO_passive			0.198	0.449		
SAL SU*IO_passive			-0.626	0.362		
GRM SU*IO_passive			-0.223	0.162		
EBT SU*IO_passive			-5.577	0.051		
OPR SU*IO_passive			4.722	0.069		
NI SU*IO_passive			1.475	0.230		
GPS SU*IO_passive			-0.212	0.360		
CPS SU*IO_passive			0.057	0.955		
EPS SU*IO_active			-0.044	0.198		
SAL SU*IO_active			0.103	0.152		
GRM SU*IO_active			0.040	0.117		
EBT SU*IO_active			0.776	0.013		
OPR SU*IO_active			0.767	0.035		
NI SU*IO_active			0.830	0.001		
GPS SU*IO_active			0.068	0.051		
CPS SU*IO_active			-0.122	0.486		
EPS SU* Blockholders					-0.044	0.266
SAL SU* Blockholders					0.166	0.028
GRM SU* Blockholders					0.042	0.201
EBT SU* Blockholders					0.708	0.011
OPR SU* Blockholders					1.011	0.026
NI SU* Blockholders					0.715	0.015
GPS SU* Blockholders					0.063	0.195
CPS SU* Blockholders					-0.081	0.734
IO_active			-0.004	0.169		
IO_passive			0.018	0.321		
Blockholders					0.008	0.054
IO	0.004	0.068			0.004	0.058
'other surprises' and controls	Yes		Yes		Yes	
Firm, year, quarter effects	Yes		Yes		Yes	
N	176,956		176,956		176,956	
Adj. R^2	12.60%		12.79%		9.35%	

The table reports results for equation (5) augmented with interaction terms between 'other surprises' and institutional ownership measures. IO is total institutional ownership in a stock. IO_active is the percentage of shares held by active investors (mutual fund managers and investment advisers). IO_passive is the percentage of shares held by active investors (bank trusts, insurance companies, and other institutions such as pension funds, endowments). Blockholders is the percentage ownership by blockholders defined as institutional investors who hold more than 1% of outstanding shares in terms of market capitalization. Coefficients on uninteracted 'other surprises' are not reported.

Table 6 Investor responses to EPS surprises conditional on the availability of 'other surprises.'

	Estimate	p-value
Intercept	0.150	0.002
EPS SU	0.149	0.001
EPS SU×SAL Dummy	0.040	0.049
EPS SU×GRM Dummy	0.047	0.053
EPS SU×EBT Dummy	0.103	0.010
EPS SU×OPR Dummy	-0.023	0.272
EPS SU×NI Dummy	-0.053	0.086
EPS SU×GPS Dummy	0.021	0.333
EPS SU×CPS Dummy	-0.055	0.244
SAL Dummy	0.001	0.369
GRM Dummy	0.000	0.733
EBT Dummy	0.001	0.222
OPR Dummy	0.001	0.584
NI Dummy	-0.002	0.134
GPS Dummy	0.000	0.672
CPS Dummy	0.000	0.887
Controls	Yes	
Firm effect	Yes	
Year effect	Yes	
Quarter effect	Yes	
N	176,954	
p	0.000	
Adj. R^2	7.68%	

The table reports results from regressing earnings announcements abnormal returns on the street EPS surprise, EPS SU, and indicator variables for the availability of 'other surprises' at earnings announcements.

Table 7 Price reaction to 'other forecast' revisions

	Entire sample period		After 2010	
	Estimate	p	Estimate	p
Intercept	-4.882	0.000	-1.228	0.297
ΔEPS revision	2.044	0.068	1.011	0.211
ΔSAL revision	0.005	0.045	0.003	0.002
ΔGRM revision	0.307	0.000	0.214	0.000
ΔEBT revision	0.009	0.049	0.009	0.080
ΔOPR revision	0.008	0.028	0.001	0.422
ΔNI revision	0.002	0.013	0.006	0.033
ΔGPS revision	0.203	0.000	0.198	0.000
ΔCPS revision	0.759	0.006	0.798	0.000
Controls	Yes		Yes	
Analyst effect	Yes		Yes	
Firm effect	Yes		Yes	
Year effect	Yes		Yes	
Quarter effect	Yes		Yes	
N	2,118,182		1,061,791	
p	0.000		0.000	
Adj R^2	4.66%		4.79%	

The table reports results for equation 6, which examines price reactions to analyst street EPS revisions and 'other forecast' revisions.