The Age of Cheap Money and Passive Investing:

Are Pro Forma Earnings Value Relevant?

Florian Meier

University of the West of England, UK

January 2018

Abstract

This study investigates the impact of pro forma earnings on stock misvaluation. In light of a decade of substantial changes in the market and investment environment that are challenging the traditional primacy of accounting disclosures for valuation, we link mispriced shares to the information that is disclosed by firms voluntarily. Using a hand-collected sample of pro forma earnings from quarterly earnings press releases of the constituent firms of the US Dow Jones 30 between 2011 and 2017, we find that providing pro forma earnings reduces overvaluation for the most overvalued stocks. However, further analysis indicates that for firms with higher analyst earnings forecast dispersion, disclosing pro forma earnings increases these firms' overvaluation due to higher optimism and uncertainty. These findings suggest that the role of pro forma earnings is important and value relevant in the new market conditions.

Keywords: Accounting disclosure; pro forma earnings; non-GAAP disclosures; stock misvaluation

JEL classification: G38; M40; M41

EFMA classification: 200; 210; 180; 710

Bristol Business School, University of the West of England, Coldharbour Lane, Bristol BS16 1QY, United Kingdom; Phone: 44(0)117-3287459; E-mail: florian.meier@uwe.ac.uk.

The Age of Cheap Money and Passive Investing:

Are Pro Forma Earnings Value Relevant?

January 2018

Abstract

This study investigates the impact of pro forma earnings on stock misvaluation. In light of a decade of substantial changes in the market and investment environment that are challenging the traditional primacy of accounting disclosures for valuation, we link mispriced shares to the information that is disclosed by firms voluntarily. Using a hand-collected sample of pro forma earnings from quarterly earnings press releases of the constituent firms of the US Dow Jones 30 between 2011 and 2017, we find that providing pro forma earnings reduces overvaluation for the most overvalued stocks. However, further analysis indicates that for firms with higher analyst earnings forecast dispersion, disclosing pro forma earnings increases these firms' overvaluation due to higher optimism and uncertainty. These findings suggest that the role of pro forma earnings is important and value relevant in the new market conditions.

Keywords: Accounting disclosure; pro forma earnings; non-GAAP disclosures; stock misvaluation

JEL classification: G38; M40; M41

EFMA classification: 200; 210; 180; 710

1. Introduction

Firms' pro forma earnings disclosures are a recurring and hotly debated topic in the literature. While research has documented a range of factors that influence the disclosure of pro forma earnings (e.g., Black and Christensen, 2009; Brown et al., 2012; Isidro and Marques, 2015), much less attention has been paid to the effect of such pro forma disclosures on the market's perception of firm value. Theoretically, pro forma earnings should provide additional information to help the market price a firm's shares more accurately, thus some firms are willing to disclose this information voluntarily. This study asks the question whether these voluntary disclosures allow for more precise valuation of shares, i.e. a reduction of stock misvaluation (defined as a deviation of share price from its fundamental value).

Firms are required to report earnings according to generally accepted accounting principles (GAAP), but frequently also provide adjusted earnings numbers (this is so-called pro forma earnings). Different to the required reported earnings, pro forma earnings exclude expenses items that management considers as non-recurring such as restructuring costs (Bhattacharya et al., 2007). For firms, the intention is to show a more accurate picture of performance as these one-off cost items may distort real underlying performance (Bhattacharya et al., 2007). However, critics argue that these numbers are self-serving and misleading investors, as they can be used to deflect attention from poor performance and to present the firm in a better light (e.g. Christensen, 2007; Black and Christensen, 2009). Having said that, investors and analysts still widely use these adjustments for analyzing firm performance and for making investment decisions. This practice can result in misallocation of capital, particularly by less sophisticated investors who are more susceptible to being misled than professionals (Bhattacharya et al., 2007).

Early studies on the value relevance of pro forma earnings disclosures have provided some evidence that these adjusted earnings have incremental information content (e.g. Bradshaw and Sloan, 2002; Bhattacharya et al., 2003; Lougee and Marquardt, 2004; Fredrickson and Miller, 2004) and can affect mispricing (e.g. Hirshleifer and Teoh, 2003; Johnson and Schwartz, 2005; Zhang and Zheng, 2011; Doyle, 2013). The existing evidence, however, has one major limitation. Related studies were mostly based on data from the late 1990s or early 2000s. Since then, the environment for stock market investing and relevance of information disclosure has undergone radical changes. Prior studies did not capture such environmental changes in financial markets.

Since the financial crisis, there have been extremely loose monetary conditions and low funding costs for investors. This often refers to 'cheap money' provided by the central bank to bank-holding companies, and enables investors to borrow large sums cheaply. This has led to a flood of investments into stock markets around the world in search of returns, with less regard paid to fundamental valuations and differences between firms (Dodwell, 2013; Verma, 2016). In turn, stock valuations in many cases reach to historic highs, thus share prices increasingly deviate from their fundamental value.[1] In addition, firms can also borrow money from banks easily in order to invest in low or potentially negative NPV projects. As such, disclosing pro forma earnings may help the market understand a firm's cash flows better for evaluating a firm's actual performance. More importantly, a recent substantial increase in the use of pro forma earnings disclosures has led US regulators to apply greater scrutiny and modified guidelines[2], along with a number of new regulations to better regulate and curb their use in the wake of this increase (Zhang and Zheng, 2011; Black et al., 2017d).

[1] Sid Verma, "'Irrational Exuberance' May Rule the Roost in Stock Markets", *Bloomberg.com*, November 14, 2017; Adam Shell, "Dow tops 23,000 for first time as stock market rally gains speed", *www.usatoday.com*, October 17, 2017.

[2] See recent press coverage, e.g. Tatyana Shumsky and Theo Francis, "Accounting choices blur profit picture", *The Wall Street Journal*, June 28, 2016; Tatyana Shumsky, "Firms say goodbye to prettied-up financial reports", *The Wall Street Journal*, August 29, 2016. Black et al. (2017a, 2017d) also find

In this study, we assess whether pro forma earnings affect stock misvaluation, and to what extent stock prices are adjusted to their disclosure. Stocks are in general mispriced in the markets for a number of reasons. There has been a stellar increase in stock market investments via Exchange Traded Funds (ETFs)[3], which has substantially increased the proportion of shares bought primarily due to their inclusion in an index. As a result, each individual firm's performance is less taken into consideration and, therefore, each stock in the index is likely to be mispriced and thus mispriced stocks are introduced into the market (Wurgler, 2010; Belasco et al., 2012; Da and Shive. 2016). In addition, a recent record high of corporate debt is another factor related to stock mispricing. There has been a substantial increase in US corporate debt levels in the last few years. In the three years to 2015, US firms issued record amounts of debt leading to US corporate debt issuance climbing to a post financial crisis decade-high.[4] Among others, Myers and Majluf (1984) and Klein et al. (2002) show evidence that debt and changes in debt and capital structure affect misvaluation.

We use a sample of adjusted earnings figures hand-collected from quarterly earnings press releases of the U.S. firms that make up the Dow Jones 30 between 2011 and 2017, together with a logit model to analyze the relation between misvaluation and pro forma earnings disclosure in a given quarter. Misvaluation is measured as the firm's market-to-book ratio (*MTB*). 97% of our sample has an *MTB* ratio greater than one, indicating that the majority of firms are overvalued. Our analysis is based on Dow Jones 30 firms as these firms are large and among the most recognisable and well-known companies (e.g. Apple Inc., Microsoft Inc.). A non-negligible percentage of the cheap funds made available by central

---

that while stricter regulations have curbed the use of pro forma earnings disclosures, their use is still widespread.

[3] Sarah Krouse, "ETFs Now Have $1 Trillion More Than Hedge Funds", *The Wall Street Journal*, August 1, 2017; Justin Fox, "Mutual Funds Ate the Stock Market. Now ETFs Are Doing It.", *Bloomberg.com*, May 16, 2017.

[4] Tracy Alloway, "Goldman Sachs Says Corporate America Has Quietly Re-levered", *Bloomberg.com*, November 10, 2015; Mike Cherney and Ian Stumpf, "U.S. firms shoulder rising debt", *The Wall Street Journal*, May 3, 2015.

banks will be invested in some of the largest and most well-known firms. In addition, these large firms are included in a multitude of ETFs[5], so that a lot of demand for their shares stems from their index membership, irrespective of valuation or misvaluation. As ETF and index investing has been linked to misvaluation (e.g. Wurgler, 2010), for instance by affecting Tobin's Q (e.g. Yang and Morck, 2001), our sample is particularly suitable.

Our analysis provides strong evidence to show that providing pro forma earnings reduces overvaluation for the most overvalued stocks but not for the least overvalued stocks. Our further analysis shows that, for firms with higher analyst earnings forecast dispersion, disclosing pro forma earnings increases overvaluation. The least overvalued firms, however, would see decreased overvaluation in the presence of higher analyst earnings forecast dispersion. More importantly, pro forma earnings is associated with less overvaluation in the quarter following a disclosure of pro forma earnings, implying that the effect of reducing overvaluation persists throughout the quarter following disclosure. Overall, pro forma earnings disclosures provide value relevant information to allow for more accurate pricing of shares. Our findings fill a gap in the literature that has arisen due to the substantial changes in the market environment in the last few years. We highlight that information disclosed voluntarily by firms can still affect mispricing in an age in which abundant liquidity and passive investing have increased substantially.

This study contributes to the literature mainly in two ways. First, we demonstrate that despite the significant changes in the investing and monetary environment, pro forma earnings disclosures provide value relevant information that can help reduce mispricing of shares. This extends prior evidence on the effect of adjusted earnings on misvaluation

[5] According to Nasdaq.com (January 13, 2018), there are six ETFs on the Dow Jones Index. But its constituents can individually be included in a multitude of different ETFs. For instance, Apple Inc. alone is included in 143 ETF's top 15 holdings, while Microsoft Inc. is part of 132 ETF's top 15 holdings (see *ETFdb.com*, as of January 13, 2018). Hence shares of the 30 Dow Jones firms face demand from a variety of sources to be included in different indexes. This substantially increases purchases of shares to monotonically satisfy index-inclusion, with less regard to valuation in the purchases.

obtained from earlier periods. Second, our investigation is particularly timely in light of increasing attention paid by standard setters and regulators to whether accounting disclosures provide the information to meet investors' needs. This is against the background of now widespread provision and the use of pro forma numbers by investors, and corresponding initiatives of how to modify existing reporting, whether it still meets the needs of users (see Black et al., 2017a). Our findings are relevant for regulators to consider whether the regulations regarding non-GAAP disclosures may need to be revised.

The remainder of the paper is organized as follows. Section 2 discusses the motivation and related literature. Section 3 describes the data and the empirical methodology. Section 4 presents and discusses the empirical findings. Section 5 concludes.

2. Related literature and research questions

2.1 The informational role of pro forma earnings in accounting disclosures

Generally, non-mandatory voluntary disclosure is not subject to official regulations and therefore offers firms incentives and scope to use them in a self-serving way (e.g. Healy and Palepu, 2001; Graham et al., 2005; Gu and Li, 2007). Pro forma earnings, in particular, are voluntary information not required by GAAP regulations. Despite new regulations having come into force in recent years (see Black et al., 2017a, 2017d), firms have some leeway to adjust earnings to present a preferred picture of performance.

Early studies have examined the question of the valuation relevance of pro forma earnings disclosures by mostly looking at their association with future stock returns and firm profitability (e.g. Bradshaw and Sloan, 2002; Bhattacharya et al., 2003; Brown and Sivakumar, 2003; Doyle et al., 2003; Lougee and Marquardt, 2004; Fredrickson and Miller, 2004). They provide evidence that pro forma earnings disclosures contain incremental information content above GAAP earnings. Brown and Sivakumar (2003) compare the value

relevance of manager- and analyst-provided earnings numbers and GAAP earnings for a sample of quarterly earnings during the 1989-1997 period. They find that pro forma earnings numbers are more value relevant than GAAP earnings. Doyle et al. (2003) show that investors underreact to other (non-recurring, non-cash) exclusions at the earnings announcement and correct this mispricing over the subsequent three years. Their study suggests that higher levels of exclusions lead to lower future cash flows, which are not fully understood by investors at that time. Consequently, they show that a trading strategy based on the excluded expenses generates large positive abnormal returns in the years following the announcement.

Bhattacharya et al. (2003) examine abnormal returns around earnings announcements for a sample of pro forma disclosures over the period 1990-2000. They find that pro forma earnings are significantly more informative to investors than GAAP operating earnings, but less informative when they meet analysts' expectations while the corresponding GAAP operating earnings fall below analysts' expectations. Investors, however, do not discount pro forma announcements that report a profit while the corresponding GAAP operating earnings report a loss. Johnson and Schwartz (2005) analyze a sample of 253 pro forma press releases during one quarter (June-August) of the year 2000 to explore whether stock prices differ between firms disclosing pro forma earnings and those that do not, as well as possible stock return premiums linked to pro forma announcements. Using a market-multiples approach and stock return tests, they do not find evidence for a price difference. Separating stocks into valuation-based portfolios they do find, however, an effect on the most overvalued (undervalued) stocks: Pro forma firms with both the lowest and highest valuation multiples also overpriced, yet this seems unrelated to pro forma disclosure. Overall, they find no evidence that investors assign a higher price to pro forma firms than to others. It shows,

however, that pro forma disclosures do not affect mispricing uniformly but can be found at the valuation extremes on both ends.

Some studies (e.g. Fredrickson and Miller, 2004; Elliott, 2006; Bhattacharya et al., 2007) show that it is mostly less sophisticated investors who would be misled by pro forma earnings disclosures. Evidence has come from experiments (e.g. Fredrickson and Miller, 2004; Elliott, 2006) and empirical studies such as Bhattacharya et al. (2007), who confirm that market reactions to pro forma earnings stem chiefly from less sophisticated investors, who buy on the pro forma information. Recent studies (e.g. Zhang and Zheng, 2011; Doyle et al., 2013; Whipple, 2016) provide further evidence for the relationship between pro forma disclosures and mispricing. Compared to earlier studies, they do not find strong evidence of mispricing. For instance, Zhang and Zheng (2011) show that the introduction of Regulation G in 2003 with stricter requirements for reconciliations has led to less mispricing for firms whose reconciliation quality has improved. For firms that previously already had higher quality reconciliations, however, there is no effect on mispricing. Doyle et al. (2013) show that firms define non-GAAP measures in a way to help them meet or beat analyst earnings forecasts. Their results suggest that investors might see through management's attempts to paint a positive picture by discounting positive earnings surprises when they are accompanied by exclusions from GAAP earnings. Whipple (2016) uses data from 2004 to 2012 to study non-GAAP non-cash exclusions and finds that investors' response to the non-GAAP earnings surprise is 5.5 times the response to the other exclusions surprise, suggesting investors heavily discount other exclusions when valuing firm performance. Moreover, the results also show that the market response happens at the earnings announcement and there is no evidence for mispricing that is corrected in subsequent periods.

Many of the existing empirical studies used data from the latter half of the 1990s, or early 2000s so those findings appear dated. Since then, there has been a significant increase

in the use of pro forma disclosures, a number of new regulations to better regulate and curb their use following the increase (see Black et al., 2017a, 2017d), and the aforementioned changes in the market that have potentially meaningfully changed the landscape. While new regulations seem to have reduced mispricing related to pro forma disclosures, the changes in the market environment may have introduced the opposite effect, thus elevated the potential for mispricing. Moreover, those studies tended to look at the mispricing effect in the cross-section of firms, i.e. the average effect. This, however, may mask differences in the effect depending on the level of mispricing, since Johnson and Schwartz (2005) demonstrate that the effect may appear only in the extremes of the valuation distribution. Hence a more detailed analysis is required.

This study improves our understanding of the effect of pro forma earnings disclosures on misvaluation in the presence of newly emerged factors that increasingly call into question the relevance of accounting information for valuation and investment purposes. Existing evidence on the usefulness of pro forma earnings for valuation has mostly been gathered before those changes took place, thus limiting their relevance in today's market environment.

2.2 Stock misvaluation, changes in the market environment, and pro forma earnings disclosure

Prior studies show that investors in financial markets do not always drive market prices toward the intrinsic value of a firm. In most cases, firm value is assessed incorrectly. The existing literature on stock misvaluation has attempted to explain this phenomenon (e.g. Chaplinsky and Hansen, 1993; Healy and Palepu, 1993; Lamont and Thaler, 2003; Shiller, 2003; Bloomfield and Michaely, 2004). From a traditional economics point of view, misvaluation is caused by the adverse selection problem stemming from information asymmetry between corporate insiders and outside investors and limited disclosure (e.g. Healy and Palepu, 2001). Without sufficient information about a firm's future plans,

investors cannot with certainty distinguish between better or worse investment possibilities and therefore value stocks at an average level, so that some firms are overvalued and some firms undervalued (Healy and Palepu, 2001). In addition, Ackert and Athanassakos (1997) find positive abnormal returns from buying (selling) low (high) dispersion stocks at the beginning of the year. Similarly, Sadka and Scherbina (2007) show that illiquid stocks with high forecast disagreement are more prone to mispricing, hence achieve lower subsequent returns.

Other explanations range from noise traders, differences in investor sophistication, limitations to arbitrage, or to trading costs (e.g., Daniel et al., 2001; De Long et al., 1990; Schleifer and Vishny, 1997; Lee et al., 1999; Elliott et al., 2010). From a behavioral finance perspective, misvaluation can be induced by investor irrationality (see e.g., Barberis and Thaler, 2003; Baker and Wurgler, 2007). Psychological explanations for biases leading to irrational investor behavior and mispricing include overconfidence, optimism, representativeness, conservatism, or belief perseverance (Barberis and Thaler, 2003); Baker and Wurgler, 2007). No matter the underlying reason, the result is mispriced shares.

While some prior studies have examined the effect of pro forma disclosures on mispricing, a number of developments during the last decade in the area of monetary policy and changes in investment strategies and corporate finance have significantly changed the market environment. These developments are not only challenging the dominant role of accounting information as a basis for valuation purposes, but have also introduced new sources of misvaluation. Hence this calls for another look at the usefulness of pro forma earnings disclosures to examine whether they are still relevant for valuation purposes, also in light of newly introduced regulations meant to curb and regulate their use (see e.g. Black et al., 2017a; Whipple, 2016).

To combat the effects of the financial crisis, central banks around the world have provided financial markets with unprecedented amounts of liquidity and lowered interest rates to all-time lows (see e.g. Dodwell, 2013). These loose financial conditions have now persisted for nearly a decade, thus financial markets are flooded with funds looking for investments. This has led to many assets, stock markets being one of them, having reached high, sometimes very high, valuations (Verma, 2016). Together with that, risk premia required from investments have reduced substantially. Enabled by investors' very low funding costs courtesy of very loose financial conditions, stocks that would previously not have met return criteria are now receiving funds, making investments in many stocks profitable that would not have been previously, further increasing demand and valuations.[6] In addition, there has been a significant increase in funds invested via Exchange Traded Funds (ETFs) which are more indiscriminate buyers of stocks and are linked to increased misvaluation (e.g. Wurgler, 2010; Yang and Morck, 2001). Relatedly, US corporate debt levels have increased substantially in the last few years leading to record debt issuance and debt levels, likewise enabled by loose financial conditions. This matters since debt and changes in debt and capital structure can affect misvaluation (e.g. Myers and Majluf, 1984; Klein et al., 2002), so that the question of how pro forma disclosures can help with this increased potential misvaluation component has to be reconsidered. Finally, the tightening of regulations regarding the use of pro forma disclosures in the last few years in the US had the aim of regulating and curbing their use to make it easier for investors to rely on the information. With this in mind, the usefulness of pro forma disclosures has to be re-examined. All the more in light of the other major changes in the market environment.

Disclosure of accounting information is meant to reduce information asymmetry and help investors price shares accurately (e.g. Lev, 1992; Healy and Palepu, 2001). Pro forma

[6] Donal O'Mahoney, "Central bank policies distort market signals", ft.com, March 9, 2016.

earnings, not required by GAAP, can be an additional source of information for valuation purposes. For instance, it provides a more precise picture of firm performance and 'core earnings' (Weil, 2001; Bhattacharya, 2003; Bhattacharya et al., 2007). Thus, it should make it easier for investors to judge performance and hence value (Bhattacharya, 2003). With such additional information, the stock misvaluation level should be reduced by removing transitory effects that have no long-term influence on performance. If firms can successfully emphasize that the adjustments result in a more realistic portray of underlying performance, this can enable investors to price shares more accurately, thus reduce misvaluation. In particular, since pro forma earnings are voluntary, so they should provide additional information beyond the mandatory disclosures, to help investors.

Disclosure decisions are often taken opportunistically to achieve a certain purpose (Graham et al., 2005). In fact, targeting misvaluation is a major driver of management's disclosure decisions. Since information disclosure is not costless, particularly for voluntary disclosures, firms therefore weigh up the benefits and drawbacks from providing information that they are not required to provide. They will only disclose such information if the benefits outweigh the costs. Given these considerations and potential costs, if the disclosure of pro forma earnings is done with the intention of influencing or correcting misvaluation, there is reason to suggest that firms expect such adjusted earnings to potentially influence misvaluation. Both Healy and Palepu (2001) and Graham et al. (2005) highlight that stock misvaluation is an important motivation in management's disclosure decisions. Bradshaw and Sloan (2002) point out that investors are misled by pro forma earnings if they are higher than GAAP numbers, which may exacerbate misvaluation, most likely overvaluation. Bradshaw et al. (2016) also shows that pro forma earnings decrease investor consensus about future performance and thus increases mispricing. Moreover, Hirshleifer and Teoh (2003) demonstrate that non-GAAP disclosures can help price shares more accurately, but can also

lead to upward bias in stock prices if some investors do not pay full attention to evaluating the pro forma numbers. Taken together, these major recent developments raise the question of the role and relevance of disclosure for stock valuation. Potentially visible in increased overvaluation due to more indiscriminate shares buying. If these changes have introduced more potential for misvaluation, what is the role of disclosures, especially voluntary, for firm valuation in this new situation? Are voluntary pro forma earnings disclosures useful for valuation in this context?

In our study, we also go a step further to investigate the usefulness of pro forma earnings disclosure for firms with high analyst earnings forecast disagreement. The existing studies have demonstrated that the dispersion in analyst earnings per share forecasts leads to mispricing of shares, especially to overvaluation (see e.g. Ackert and Athanassakos, 1997; Athanassakos and Kalimipalli, 2003; Zhang, 2006; Sadka and Scherbina, 2007). Forecast dispersion is a proxy for information uncertainty about the earnings that captures both information deficits and volatility of the firm's underlying fundamentals (Ackert and Athanassakos, 1997; Zhang, 2006). The higher (lower) such uncertainty, the less (more) consensus there will be among analysts regarding the upcoming earnings number, leading to higher (lower) dispersion in the forecasts.[7] Thus, greater (lower) uncertainty surrounding the firm, analysts are less concerned with their reputation when issuing optimistic forecasts, resulting in overvaluation (undervaluation) (Ackert and Athanassakos, 1997). For high uncertainty stocks, the additional information provided by pro forma disclosures will be of particular importance. This study examines whether the function of disclosing pro forma earnings in order to reduce information asymmetry is limited due to the uncertainty derived from forecast dispersion.

[7] Studies find that when there is higher uncertainty, analysts become more optimistic in their forecasts and the forecasts tend to be higher overall (e.g. Ackert and Athanassakos, 1997; Athanassakos and Kalimipalli, 2003).

3. Sample, data, and empirical methods

3.1. Sample of pro forma earnings press releases

We hand-collect quarterly earnings press releases of the constituents of the Dow Jones 30 for the period Q1 2011 to Q1 2017. There is a surge in the use of adjusted earnings numbers during this period. The most recent data available is for 2017. We retrieved the press releases by searching PR Newswire and Business Wire on LexisNexis and hand-collected all available adjusted earnings figures from the releases. Press releases were searched for the keywords "pro forma", "pro-forma", "proforma", and other frequently used terms.[8] We identify 380 earnings press releases where regular GAAP earnings are supplemented by adjusted earnings numbers. Stock prices data is obtained from the CRSP database and then merged with the Compustat database for firm-specific data. We exclude firms with negative book value of assets and book value of equity in a given year. We also require observations to have valid data for computing stock misvaluation proxies. This process results in a final sample of 747 observations (firm-quarters).

3.2. Measurement of variables

3.2.1 Stock misvaluation measurement

We measure misvaluation as the firm's market value of equity to book value of equity (*MTB*), that is frequently used in the literature (e.g. Baker and Wurgler, 2002; Johnson and Schwartz, 2005; Dong et al., 2006; Hassan et al., 2009). Almost all firm quarter observations in our sample are overvalued (*MTB*>1, see descriptive statistics in 3.4). This is consistent with prior studies showing that the effect of pro forma disclosures on misvaluation happens in the top or bottom tails of the distribution, the most overvalued (undervalued) stocks (e.g.

[8] Consistent with prior research (e.g. Brown et al., 2012; Black et al, 2017c) we use the terms 'pro forma', 'pro-forma', 'proforma', 'earnings excluding', 'net income excluding', 'adjusted net income', 'adjusted loss', 'cash earnings', 'earnings before', 'free cash flow', 'normalized EPS', 'normalized earnings', 'recurring earnings', 'distributable cash flow', 'GAAP one-time adjusted', 'GAAP adjusted', or 'cash loss'.

Johnson and Schwartz, 2005). In this study, we examine the top and bottom distribution groups to separate firms that are most overvalued from those merely overvalued (the lowest third of overvaluation). To measure overvaluation we rank firms on *MTB* from highest to lowest in each quarter. We then classify firms into the top third of the distribution (most overvalued) and bottom third (least overvalued) to study the effect of pro forma earnings on misvaluation.[9]

3.2.2 Pro forma earnings disclosures and control variables

To investigate the effect of firms' pro forma earnings disclosure on overvaluation, we use two proxies frequently used in the literature (e.g. Brown et al., 2011; Black and Christensen, 2009; Black et al., 2017a, 2017c; Isidro and Marques, 2015).[10] First, to gauge the general effect, we create an indicator variable whether a firm discloses adjusted earnings during a given quarter or not. EPS_{PF} takes the value of 1 if a firm discloses adjusted earnings in a quarter and 0 otherwise. Second, we measure whether the pro forma earnings number allows the firm to meet or beat analyst earnings forecasts. We create an indicator variable, EPS_{MB}, that takes the value of 1 if the firm's pro forma earnings allow it to meet or beat the mean analyst earnings forecast despite a miss on GAAP numbers, and 0 otherwise.

We also include a number of controls for firm-specific characteristics (see e.g. Zhang (2006); Badertscher (2011); Chi and Gupta (2009); Hassan et al. (2009)). We include analyst following (*AF*), analyst earnings forecast dispersion (*DISP*), firm size (SIZE), leverage (*LEV*), and volatility in return on assets (*VOLA*). The detailed definition of variables is provided in reported tables.

[9] Other studies use a similar approach to identify overvalued (undervalued) firms (e.g. Sawicki and Shreshta, 2014; Badertscher, 2011).

[10] Initially we also examined a third proxy pro forma earnings disclosure often used in the literature, EPS_{Profit}. This measures whether the pro forma earnings number provided turns an operating GAAP loss into a pro forma profit. After the data collection process, however, it turned out that only in 5 quarters out of 747 firms disclosed pro forma earnings that turned an operating GAAP loss into a pro forma profit. We therefore dropped this variable from the analysis.

3.3 Regression model

To examine the effect of pro forma disclosures on overvaluation, we use a logit model. The baseline specification is as follows:

$$OV = \alpha + \beta_1 PROFORMA + \beta_2 DISP + \beta_3 SIZE + \beta_4 LEV + \beta_5 VOLA + \beta_6 AF + \varepsilon_{i,t} \quad (1)$$

where *OV* is our overvaluation measure, and *PROFORMA* is the pro forma earnings measure (either *EPS_PF*, *EPS_MB*, or *EPS_Profit*). The remaining variables are our controls.

Table 1 presents the descriptive statistics. The results show that in 50.9% of our sample quarters firms disclose adjusted (pro forma) earnings (*EPS_PF*). For adjusted earnings that meet or beat analysts' forecasts (*EPS_MB*), we find that firms disclose such pro forma numbers in 44.4% of the quarters. Thus, in nearly half of our sample quarters, firms would issue such adjusted earnings, which indicates a widespread practice across firms.

[Insert Table 1 here]

Regarding the misvaluation measure, sample firms have a mean market-to-book value (*MTB*) of 4.516, which suggests a substantial market premium attached to the book value of equity; the maximum *MTB* of 28.56 displays substantial overvaluation. At the lower end of the distribution, while the minimum is 0.807 (slightly undervalued), the value for the first quartile (2.279) already shows *MTB* considerably higher than 1, suggesting a strong tendency towards overvaluation of our sample firms. Consistent with this, only 23 firms in our sample have a quarterly observation with *MTB*<1, so that 97% of quarterly observations are overvalued based on *MTB*. This supports our approach to focus on overvaluation and the different levels within instead of overall misvaluation.

The mean for Analyst forecast dispersion (*DISP*) is 0.5 with a lower (upper) quartile of 0.241(0.759). The values for firm size (Market value of equity (*SIZE*)) show that our sample firms are large, as would be expected from the Dow Jones 30. The mean (median) Market value of equity (*SIZE*) is $11.777 billion ($11.845 billion), with a minimum (maximum) of $10.207 billion ($13.3 billion). In

terms of leverage (*LEV*), we see a wide variety. While the mean (median) is 0.623 (0.406), the minimum (maximum) is 1.132 (3.04). Stock return volatility (*VOLA*) varies widely across firms. While the mean is 0.664, the minimum (maximum) is 0.052 and 2.349, respectively. Thus we do find both low volatility and high volatility stocks on our sample. Finally, our sample firms are followed by 24 analysts on average (*AF*). This high number of analysts covering our sample firms is not surprising. We study 30 of the most well-known and biggest firms in the US, thus one can expect those firms to be of high interest to investors, and therefore analysts. We take the log of *SIZE* and *LEV* and winsorise *MTB*, *DISP*, *SIZE*, *LEV*, *VOLA* to reduce the influence of outliers and deal with skewness in the regression models.

4. Empirical results

4.1. The effect of pro forma earnings on misvaluation: base case

Our first model examines the effect of pro forma earnings disclosure on misvaluation. Table 2 presents the estimated results for the most overvalued (Panel A) and the most undervalued stocks (Panel B) for the two pro forma measures (*EPS_PF*, *EPS_MB*). We run the model with three specifications: with no fixed effects, quarter fixed effects, and firm and quarter fixed effects.

[Insert Table 2 here]

In columns 1 to 3 of Panel A, for the most overvalued stocks, we find that disclosure of adjusted earnings (*EPS_PF*) has a significant negative association with overvaluation (1% level). This suggests that disclosing pro forma earnings reduces overvaluation for those stocks that are most overvalued, i.e. where valuation has gone up too far above 'fair value' of the stock. This finding supports the claim made by advocates of pro forma earnings that their provision helps shares to be priced more accurately, thus it is useful for valuation (see e.g. Bhattacharya et al., 2007). This is consistent with prior evidence (e.g. Doyle et al., 2003; Lougee and Marquardt, 2004; Zhang and Zheng, 2011) showing that pro forma disclosures

are linked to misvaluation. As to control variables, analyst earnings forecast dispersion (*DISP*) shows a negative association with overvaluation (1% level). By contrast, both leverage (*LEV*) and stock return volatility (*VOLA*) have a significant positive association with overvaluation at the 1% level. Firm size (*SIZE*) and analyst following (*AF*) are not significant. The results are consistent irrespective of presence or type of fixed effects.

In columns 4 to 6 of Panel A (based on *EPS_MB*), the results show that providing adjusted earnings has a negative association with overvaluation (1% level). These results imply that providing pro forma earnings, that meet or beat analyst earnings forecasts (if only on a non-GAAP basis), leads to reduced overvaluation for the most overvalued stocks. These results are consistent and robust to those reported in Panel A. In addition, the fact that they are associated with lower overvaluation may also signal that investors still see through the firms' attempt to provide positive adjusted numbers to deflect from a miss in GAAP earnings. Investors value firms using the GAAP numbers and do not fully buy into the firms' adjusted earnings. Adjusted earnings that meet or beat analyst forecasts when the underlying GAAP earnings are a miss might be perceived negative by the market, hence a reduction in overvaluation. This finding is similar to Bhattacharya et al. (2003) who report that investors perceive this type of pro forma earnings to be less informative. The results for our control variables are the same as for the model using *EPS_PF*. Analyst earnings forecast dispersion (*DISP*) is negatively associated with overvaluation (1% level), whereas both leverage (*LEV*) and stock return volatility (*VOLA*) show a significant positive association (1% level). Firm size (*SIZE*) and analyst following (*AF*) are insignificant.

Turning our attention to the least overvalued stocks in Panel B, we do not find much of an effect of adjusted earnings measures on overvaluation. First, for the disclosure of adjusted earnings per se (*EPS_PF*, columns 7 to 9), we find a marginal effect (10% level) only for the model with firm and quarter fixed effects (column 9). The positive association indicates that

providing pro forma earnings increases overvaluation for those stocks that are least overvalued, yet the effect is only marginal. In terms of control variables, the significant associations retain their significance levels (1%) but have the opposite sign to those reported in Panel A for the most overvalued stocks. Analyst earnings forecast dispersion (*DISP*) is positively associated with overvaluation. Both leverage (*LEV*) and stock return volatility (*VOLA*) have a significant negative association with overvaluation. Analyst following (*AF*) is significant positive at the 5% level. Firm size (*SIZE*) is significant positive (5% level) in the model with firm and quarter fixed effects (column 9).

In columns 10 to 12 of Panel B (*EPS_MB*), an effect is found only for the model with firm and quarter fixed effects (column 12). Thus, there is a positive effect (5% level) of disclosing adjusted earnings that meet or beat analyst earnings forecasts on overvaluation for the least overvalued stocks. As to control variables, analyst earnings forecast dispersion (*DISP*), and analyst following (*AF*) are positively associated with overvaluation (at the 1% and 5% level, respectively). Stock return volatility (*VOLA*) and leverage (*LEV*) have a significant negative association with overvaluation for the least overvalued stocks.

Overall, that pro forma earnings reduce (increase) overvaluation for the most (least) overvalued stocks points to the role of adjusted earnings – it helps to narrow down firm value towards a value in between these two extremes, while still being in overvaluation territory. Hence, there is evidence that pro forma disclosures are value relevant.

4.2. The effect of pro forma earnings for high uncertainty stocks

Next, we explore the role of analyst earnings forecast dispersion on the association between adjusted earnings and overvaluation, and potential differences between undervalued and overvalued firms. To test that, we include an interaction term between analyst earnings forecast dispersion and the pro forma earnings measure in our base model. The results are

presented in Table 3. Panel A displays results for the most overvalued stocks and Panel B for the most undervalued stocks.

[Insert Table 3 here]

In columns 1 to 3 of Panel A of Table 3 (based on the pro forma measure *EPS_PF*), we observe that the coefficient on the interaction term is significantly positive (at the 1% level), while the coefficient for *EPS_PF* remains significantly negative (also 1% level). This means that for firms with higher analyst earnings forecast dispersion, disclosing pro forma earnings is linked to increased overvaluation. Thus, while in general disclosing pro forma earnings can help reduce overvaluation for the most overvalued stocks, for firms with higher forecast dispersion we find the opposite relationship. This suggests that the overvaluation effect of high uncertainty (optimism) is stronger than the pro forma effect of reducing overvaluation, and outweighs the benefits of pro forma disclosure. This is consistent with the literature showing that high uncertainty (dispersion stocks) tend to be overvalued (e.g. Ackert and Athanassakos, 1997; Athanassakos and Kalimipalli, 2003). In terms of control variables, analyst earnings forecast dispersion (*DISP*) has a significant negative association with overvaluation (1% level). Leverage (*LEV*) and stock return volatility (*VOLA*) have a significant positive association with overvaluation at the 1% level. Firm size (*SIZE*) and analyst following (*AF*) are not significant.

The results for *EPS_MB* (columns 4 to 6 of Panel A) are consistent with those above. While the most overvalued firms show a reduction in overvaluation, *EPS_MB* increases overvaluation for those firms with higher analyst earnings forecast dispersion (1% level). This further strengthens the conclusion that for firms with higher uncertainty about their earnings, providing adjusted earnings add to the uncertainty. Analyst earnings forecast dispersion (*DISP*) remains significant negative, leverage (*LEV*) and stock return volatility

(*VOLA*) significant positive, while firm size (*SIZE*) and analyst following (*AF*) remain insignificant.

In columns 7 to 9 of Panel B of Table 3 (based on *EPS_PF* and for least overvalued stocks), the interaction term is significant negative (at the 1% level), while *EPS_PF* itself becomes significant positive (1% level). This suggests that for the least overvalued firms with high analyst earnings forecast dispersion, disclosing pro forma earnings is associated with a reduction in overvaluation. Thus, for those firms, disclosing pro forma earnings provides useful information to the market that helps bring valuation closer to fundamental value. The control variables are consistent with our baseline model results in Table 2 (columns 7 to 9). Analyst earnings forecast dispersion (*DISP*) and analyst following (*AF*) are positively associated with overvaluation, while leverage (*LEV*) and stock return volatility (*VOLA*) have a significant negative association with overvaluation. Firm size (*SIZE*) is insignificant. In columns 10 to 12 of Panel B (based on *EPS_MB* and for least overvalued stocks), we find that providing adjusted earnings reduces overvaluation (1% level) for this group of stocks, suggesting that the function of providing pro forma earnings enables to meet or beat analyst earnings forecasts when GAAP earnings fall short of forecasts. Taken together, the results show that for the least overvalued firms, disclosing pro forma earnings numbers can reduce overvaluation in the presence of higher uncertainty regarding what the quarterly earnings are going to be, as expressed by the dispersion in analyst earnings forecasts.

4.3. Additional tests

We recognize that it is possible the market may take time to fully incorporate the information into prices. In this section, we test the effect of pro forma disclosure on misvaluation one quarter after the earnings release to take into account. Table 4 presents the results of our tests of the effect of pro forma disclosure on overvaluation one quarter ahead,

thus whether adjusted earnings affect overvaluation in t_{+1}. We focus on overall overvaluation instead of separating into most (least) overvalued firms as previously and use a Tobit model for the analysis; the sample is reduced to 715 observations due to data limitations for Q_{t+1}.[11]

[Insert Table 4 here]

In columns 1 to 3 of Table 4, we observe that the disclosure of pro forma earnings per se (*EPS_PF*) is associated with less overvaluation in Q_{t+1} (at the 1% level), indicating that an effect of reducing overvaluation persists throughout the quarter following disclosure. In terms of controls variables, the coefficient for analyst forecast dispersion (*DISP*) is significant negative (1% level), whereas all other controls are significant positive (*LEV*, *VOLA*, *AF* at the 1% level; *SIZE* at the 5% level but insignificant when firm and quarter fixed effects are included). Next, the results for *EPS_MB* (columns 4 to 6) show that providing adjusted earnings is also associated with lower overvaluation in Q_{t+1}. Thus, providing this type of pro forma earnings has an effect that persists into the following quarter. Control variables show associations consistent with those in the *EPS_PF* model in columns 1 to 3. As in our baseline model (Table 2), the coefficient on *EPS_Profit* in columns 7 to 9 is insignificant, that means providing pro forma earnings that turn a GAAP loss into a non-GAAP profit does not affect overvaluation in Q_{t+1}. Thus, providing this type of adjusted earnings does not affect overvaluation, neither following the earnings announcement nor the quarter following the announcement.

Our second additional analysis is to test the robustness of our results to the choice of misvaluation measure. Tobin's Q is another measure for misvaluation frequently used in the literature (e.g. Dong et al., 2002; Moeller et al., 2004). We re-exam our baseline model (Table 2) and the analyst forecast model (Table 3) by using Tobin's Q instead of *MTB* as a

[11] Our sample ends in Q1 2017, thus we do not have observations for Q2 2017 to calculate $Q1_{t+1}$ for 2017.

proxy for misvaluation. In Table 5 (corresponding to our baseline model), we find that the results are consistent with the main results in Table 2. For the most overvalued stocks in Panel A, most importantly, both *EPS_PF* and *EPS_MB* remain significant negative at the 1% level. The control variables are also mostly in line with the main analysis. For the least overvalued stocks in Panel B, while the results for *EPS_PF* are consistent with the main results, EPS_MB loses significance from a previous 5% level. The sign, however, is consistent (positive).

[Insert Table 5 here]

Turning to the interaction model in Table 6, the results are also consistent with the main results in Table 3. For the most overvalued stocks (Panel A), both *EPS_PF* and *EPS_BM* and the interaction terms remain significant negative (positive) at the 1% level. The control variables are largely consistent as well. For the least overvalued firms (Panel B), however, while the signs for both pro forma measures and interaction terms remain consistent, they are not significant when using Tobin's Q. As to the control variables, most of them are in line with the main results, only analyst following (AF) loses significance. Taken together, the results from our robustness tests qualitatively support our main results that pro forma earnings disclosure reduces misvaluation for overvalued stocks.

[Insert Table 6 here]

5. Conclusion

This study examines the question of the usefulness of pro forma earnings disclosures for stock valuation against the background of a decade of substantial changes in the market and investment environment that are challenging the traditional primacy of accounting disclosures for valuation, and facilitating mispricing.

We provide evidence that pro forma earnings disclosures provides additional information that helps reduce mispricing in the new financial market environment. Disclosure of pro forma earnings reduces overvaluation for the most overvalued stocks, whereas there is no such effect for the least overvalued stocks. For firms with higher analyst earnings forecast dispersion, disclosing pro forma earnings is linked to increased overvaluation for this group of stocks, consistent with the literature. The least overvalued firms, however, would see decreased overvaluation in the presence of higher analyst earnings forecast dispersion. We also find that disclosure of pro forma earnings is associated with less overvaluation in the quarter following pro forma disclosure, thus the effect of reducing overvaluation persists throughout the next quarter. Overall, our evidence suggests that pro forma earnings disclosures provide value relevant information that can help reduce mispricing of shares.

Our findings are particularly timely as standard setters and regulators have intensified their discussions of whether accounting disclosures still provide the information required by investors, and whether the regulations regarding non-GAAP disclosures need to be revised. Our evidence is particularly important in light of developments in the last decade that led to record high stock market valuations and increased mispricing, and can contribute to discussions about the role of information disclosure in an age of abundant central bank provided liquidity and passive investing.

References

Ackert, L.F., Athanassakos, G., 1997. Prior uncertainty, analyst bias, and subsequent abnormal returns. *Journal of Financial Research* 20(2), 263-273.

Athanassakos, G., Kalimipalli, M., 2003. Analyst forecast dispersion and future stock return volatility. *Quarterly Journal of Business and Economics* 42(1-2), 57-78.

Badertscher, B.A., 2011. Overvaluation and the choice of alternative earnings management mechanisms. *The Accounting Review* 86(5), 1491-1518.

Baker, M., Wurgler, J., 2002. Market timing and capital structure. *Journal of Finance* 57(1), 1-32.

Barberis, N., Thaler, R., 2003. A survey of behavioral finance. Handbook of the Economics of Finance 1, 1053-1128.

Bhattacharya, N., Black, E.L., Christensen, T.E. and Larson, C.R., 2003. Assessing the relative informativeness and permanence of pro forma earnings and GAAP operating earnings. *Journal of Accounting and Economics* 36(1), 285-319.

Bhattacharya, N., Black, E., Christensen, T., Mergenthaler, R., 2007. Who trades on pro forma earnings information? *The Accounting Review* 82, 581-619.

Black, D., Christensen, T.E., 2009. US managers' use of pro forma adjustments to meet strategic earnings benchmarks. *Journal of Business, Finance and Accounting* 36, 297-326.

Black, D., Christensen, T.E., Kiosse, P.V., Steffen, T.D., 2017a. Has the Regulation of Non-GAAP Disclosures Influenced Managers' Use of Aggressive Earnings Exclusions? *Journal of Accounting, Auditing & Finance* 32(2), 209-240.

Black, D., Christensen, T.E., Taylor Joo, T., Schmardebeck, R., 2017b. The Relation between earnings management and non-GAAP reporting. *Contemporary Accounting Research* 34(2), 750-782.

Black, Dirk E. and Black, Ervin L. and Christensen, Theodore E. and Gee, Kurt H., The Use of Non-GAAP Performance Measures in Executive Compensation Contracting and Financial Reporting (May 31, 2017c). Available at SSRN: https://ssrn.com/abstract=2343140 or http://dx.doi.org/10.2139/ssrn.2343140

Black, Dirk E. and Christensen, Theodore E. and Ciesielski, Jack T. and Whipple, Benjamin C., Non-GAAP Reporting: Evidence from Academia and Current Practice (May 11, 2017d). Tuck School of Business Working Paper No. 2966778. Available at SSRN: https://ssrn.com/abstract=2966778

Bloomfield, R. and Michaely, R., 2004. Risk or Mispricing? From the Mouths of Professionals. *Financial Management*, pp.61-81.

Bradshaw, M.T., and Sloan, R.G. 2002. GAAP versus the street: An empirical assessment of

two alternative definitions of earnings. *Journal of Accounting Research* 40(1), 41-66.

Bradshaw, M.T., Plumlee, M., Whipple, B.C., Yohn, T.L., The impact of earnings announcements on a firm's information environment (November 25, 2016). Available at SSRN: https://ssrn.com/abstract=2875839

Brown, L.D., and Sivakumar, K. 2003. Comparing the value relevance of two operating income measures. *Review of Accounting Studies* 8(4), 561-572.

Brown, N.C., Christensen, T.E., Elliott, W.B., Mergenthaler, R.D., 2012. Investor sentiment and pro forma earnings disclosures. *Journal of Accounting Research* 50(1), 1-40.

Chan, K., Chan, L.K.C., Jegadeesh, N., and Lakonishok, J., 2006. Earnings Quality and Stock Returns. *Journal of Business* 79(3), 1041-1082.

Chaplinsky, S., Hansen, R.S., 1993. Partial anticipation, the flow of information and the economic impact of corporate debt sales. *Review of Financial Studies* 6(3), 709-732.

Choi, Y., Lin, S., Walker, M., and Young, S., 2007. Disagreement over the Persistence of Earnings Components: Evidence on the Properties of Management-Specific Adjustments to GAAP Earnings, *Review of Accounting Studies* 12, 595-622.

Christensen, T.E., 2007. Discussion of "Letting the 'Tail Wag the Dog': The debate over GAAP versus street earnings revisited". *Contemporary Accounting Research* 24(3), 741-762.

Daniel, K., Hirshleifer, D., Teoh, S.H., 2002. Investor psychology in capital markets: Evidence and policy implications. *Journal of Monetary Economics* 49(1), 139-209.

De Long, J.B., Shleifer, A., Summers, L.H., Waldmann, R. J., 1990. Noise trader risk in financial markets. *Journal of Political Economy* 98(4), 703-738.

Dong, M., Hirshleifer, D., Richardson, S., Teoh, S.H., 2002. Does investor misvaluation drive the takeover market? *Journal of Finance* 61(2), 725-762.

Doyle, J., Jennings, J., Soliman, M., 2013. Do Managers Define Non-GAAP Earnings to Meet or Beat Analyst Forecasts? *Journal of Accounting and Economics* 56(1), 40-56.

Elliott, W., 2006. Are Investors Influenced by Pro Forma Emphasis and Reconciliations in Earnings Announcements? *The Accounting Review* 81(1), 113-133.

Elliott, W.B., Krische, S.D., Peecher, M.E., 2010. Expected mispricing: The joint influence of accounting transparency and investor base. *Journal of Accounting Research* 48(2), 343-381.

Frederickson, J. and Miller, J., 2004. The Effects of Pro Forma Earnings Disclosures on Analysts' and Nonprofessional Investors' Equity Valuation Judgments. *The Accounting Review* 79(3), 667-686.

Graham, J.R., Harvey, C.R. and Rajgopal, S., 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics* 40(1), 3-73.

Gu, F. and Li, J.Q., 2007. The credibility of voluntary disclosure and insider stock transactions. *Journal of Accounting Research* 45(4), 771-810.

Hassan, O.A.G., Romilly, P., Giorgioni, G., Power, D., 2009. The value relevance of disclosure: Evidence from the emerging capital market of Egypt. *The International Journal of Accounting* 44(1), 3-73.

Healy, P.M., Palepu, K.G., 1993. The effect of firms' financial disclosure strategies on stock prices. *Accounting Horizons* 7(1), 79-102.

Healy, P.M. and Palepu, K.G., 2001. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics* 31(1), 405-440.

Hirshleifer, D. and Teoh, S.H., 2003. Limited attention, information disclosure, and financial reporting. *Journal of Accounting and Economics* 36(1), 337-386.

Isidro, H. and Marques, A.C., 2013. The effects of compensation and board quality on non-GAAP disclosures in Europe. *The International Journal of Accounting* 48(3), 289-317.

Jennings, R., and Marques, A., 2011. The Joint Effects of Corporate Governance and Regulation on the Disclosure of Manager-Adjusted Non-GAAP Earnings in the US. *Journal of Business Finance & Accounting* 38(3-4), 364-394.

Johnson, W., and Schwartz, W., 2005. Are Investors Mislead by "Pro Forma" Earnings? *Contemporary Accounting Research* 22(4), 915-963.

Jensen, M.C., 2004. The agency costs of overvalued equity and the current state of corporate finance. *European Financial Management* 10(4), 549-565.

Lamont, O.A., Thaler, R.H., 2003. Can the market add and subtract? Mispricing in tech stock carve-outs. *Journal of Political Economy* 111(2), 227-268.

Lee, C., Myers, J., Swaminathan, B., 1999. What is the intrinsic value of the Dow? *Journal of Finance* 54(5), 1693-1741.

Lev, B., 1992. Information disclosure strategy. *California Management Review* 34(4), 9-32.

Lougee, B.A. and Marquardt, C.A., 2004. Earnings informativeness and strategic disclosure: An empirical examination of "pro forma" earnings. *The Accounting Review* 79(3), 769-795.

Sadka, R., Scherbina, A., 2007. Analyst disagreement, mispricing, and liquidity. *Journal of Finance* 62(5), 2367-2403.

Sawicki, J., and Shrestha, K., 2014. Misvaluation and Insider Trading Incentives for Accrual-based and Real Earnings Management. *Journal of Business Finance & Accounting* 41(7-8), 926-949.

Shiller, R.J., 2003. From efficient markets theory to behavioral finance. *Journal of Economic Perspectives* 17(1), 83-104.

Shleifer, A., Vishny, R.W., 1997. The limits of arbitrage. *Journal of Finance* 52(1), 35-55.

Weil, J., 2001. Companies pollute earnings reports leaving P/E ratios hard to calculate. *The Wall Street Journal*, August 21, 2001.

Whipple, B.C., The Great Unknown: Why Exclude "Other" Items from Non-GAAP Earnings Calculations in the Post-Reg G World? (September 10, 2015). Available at SSRN: https://ssrn.com/abstract=2480663

Yang, F., Morck, R., The Mysterious Growing Value of S&P 500 Membership (December 2001). NBER Working Paper No. w8654. Available at SSRN: https://ssrn.com/abstract=294092.

Zhang, X.F., 2006. Information uncertainty and analyst forecast behavior. *Contemporary Accounting Research* 23(2), 565-590.

Zhang, H., and Zheng, L., 2011. The valuation impact of reconciling pro forma earnings to GAAP earnings. *Journal of Accounting and Economics* 51(1), 186-202.

Table 1. Descriptive statistics

This table shows descriptive statistics for the market-to-book (*MTB*) ratio, the three pro forma measures, and the control variables used in our regression models. The sample period of firm-quarter observations is from Q1/2011 to Q1/2017. *MTB* is the market-to-book ratio, *EPS_PF* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter, and 0 otherwise, *EPS_MB* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter that meet or beat analyst earnings forecasts while GAAP operating profit falls short of forecasts, and 0 otherwise, *DISP* is the standard deviation of analyst earnings forecasts scaled by the consensus mean earnings forecast, *SIZE* is firm size measured as market value of equity, *LEV* is leverage measured as total debt to total equity, *VOLA* is the firm's average return on assets volatility over a the past 5 years, *AF* is the number of analysts following the firm. All of the firm-specific variables are winsorized at the 1% and 99% levels. *t*-statistics are reported in parentheses under the estimation coefficient. ***, **, and * denote significance levels 1%, 5%, and 10%, respectively.

	Mean	Min	p25	Median	p75	Max	Skewness	Kurtosis	St. dev.	Obs.
MTB	4.516	0.807	2.279	3.320	5.090	28.560	3.275	16.526	4.245	747
EPS_PF	0.509	0.000	0.000	1.000	1.000	1.000	-0.035	1.001	0.500	747
EPS_MB	0.444	0.000	0.000	0.000	1.000	1.000	0.224	1.050	0.497	747
DISP	0.500	0.000	0.241	0.500	0.759	1.000	0.000	1.797	0.299	747
SIZE	11.777	10.207	11.303	11.845	12.250	13.300	-0.109	2.573	0.657	747
LEV	0.623	-1.132	-0.144	0.406	1.339	3.040	0.578	2.411	0.972	747
VOLA	0.664	0.052	0.298	0.501	0.902	2.349	1.320	4.416	0.516	747
AF	24.033	8.000	19.000	23.000	28.000	51.000	0.979	3.961	7.585	747

Table 2. Logistic regression for the effect of pro forma disclosures on overvaluation: baseline results

This table shows table shows the logistic regression results for the effect of pro forma disclosures on overvaluation for the baseline model. The sample period of firm-quarter observations is from Q1/2011 to Q1/2017. *MTB* is the market-to-book ratio, *EPS_PF* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter, and 0 otherwise, *EPS_MB* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter that meet or beat analyst earnings forecasts while GAAP operating profit falls short of forecasts, and 0 otherwise, *DISP* is the standard deviation of analyst earnings forecasts scaled by the consensus mean earnings forecast, *SIZE* is firm size measured as market value of equity, *LEV* is leverage measured as total debt to total equity, *VOLA* is the firm's average return on assets volatility over a the past 5 years, *AF* is the number of analysts following the firm. All of the firm-specific variables are winsorized at the 1% and 99% levels. *z*-statistics are reported in parentheses under the estimation coefficient. ***, **, and * denote significance levels 1%, 5%, and 10%, respectively.

Panel A: Most overvalued stocks						
	(1)	(2)	(3)	(4)	(5)	(6)
	Highest MTB	Highest MTB	Highest MTB	Highest MTB	Highest MTB	Highest MTB
EPS_PF	-0.673***	-0.669***	-0.918***			
	(-3.352)	(-3.346)	(-4.061)			
EPS_MB				-0.586***	-0.588***	-0.748***
				(-3.200)	(-3.346)	(-3.621)
DISPM	-2.221***	-2.239***	-2.385***	-2.209***	-2.228***	-2.352***
	(-6.920)	(-7.130)	(-7.333)	(-6.876)	(-7.098)	(-7.202)
SIZE	-0.078	-0.060	-0.196	-0.077	-0.058	-0.203
	(-0.591)	(-0.429)	(-1.508)	(-0.578)	(-0.416)	(-1.528)
LEV	0.902***	0.925***	0.901***	0.887***	0.911***	0.881***
	(10.898)	(11.707)	(8.641)	(10.574)	(11.413)	(8.430)
VOLA	1.893***	1.940***	2.176***	1.848***	1.899***	2.095***
	(8.591)	(9.181)	(8.690)	(8.874)	(9.538)	(8.998)
AF	0.003	0.002	-0.001	0.007	0.006	0.006
	(0.250)	(0.186)	(-0.051)	(0.729)	(0.626)	(0.511)
Observations	747	747	747	747	747	747
Fixed Effect	No	quarter	firm and quarter	No	quarter	firm and quarter
StdErr_Cluster	firm	firm	firm	firm	firm	firm

Panel B: Least overvalued stocks

	(7) Lowest MTB	(8) Lowest MTB	(9) Lowest MTB	(10) Lowest MTB	(11) Lowest MTB	(12) Lowest MTB
EPS_PF	0.100	0.093	0.293*			
	(0.679)	(0.601)	(1.907)			
EPS_MB				0.231	0.235	0.408**
				(1.306)	(1.277)	(2.109)
DISPM	2.889***	2.897***	3.062***	2.948***	2.961***	3.126***
	(11.402)	(11.311)	(10.214)	(11.399)	(11.301)	(10.214)
SIZE	0.077	0.072	0.218**	0.071	0.066	0.207*
	(0.707)	(0.632)	(1.990)	(0.654)	(0.578)	(1.887)
LEV	-0.440***	-0.449***	-0.421***	-0.437***	-0.445***	-0.419***
	(-6.980)	(-7.298)	(-5.819)	(-6.943)	(-7.297)	(-5.813)
VOLA	-1.948***	-1.986***	-2.229***	-1.954***	-1.993***	-2.224***
	(-4.410)	(-4.392)	(-4.831)	(-4.511)	(-4.493)	(-4.968)
AF	0.031**	0.033**	0.040***	0.031**	0.033**	0.040***
	(2.370)	(2.496)	(2.770)	(2.431)	(2.556)	(2.760)
Observations	747	747	747	747	747	747
Fixed Effect	No	quarter	firm and quarter	No	quarter	firm and quarter
StdErr_Cluster	firm	firm	firm	firm	firm	firm

Table 3. Results for the effect of the interaction between analyst earnings forecast dispersion and pro forma disclosures on overvaluation

This table shows table shows the logistic regression results for the effect of the interaction between analyst earnings forecast dispersion and pro forma disclosures on overvaluation. The sample period of firm-quarter observations is from Q1/2011 to Q1/2017. *MTB* is the market-to-book ratio, *EPS_PF* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter, and 0 otherwise, *EPS_MB* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter that meet or beat analyst earnings forecasts while GAAP operating profit falls short of forecasts, and 0 otherwise, *DISP* is the standard deviation of analyst earnings forecasts scaled by the consensus mean earnings forecast, *SIZE* is firm size measured as market value of equity, *LEV* is leverage measured as total debt to total equity, *VOLA* is the firm's average return on assets volatility over a the past 5 years, *AF* is the number of analysts following the firm. All of the firm-specific variables are winsorized at the 1% and 99% levels. *z*-statistics are reported in parentheses under the estimation coefficient. ***, **, and * denote significance levels 1%, 5%, and 10%, respectively.

Panel A: Most overvalued stocks						
	(1) Highest MTB	(2) Highest MTB	(3) Highest MTB	(4) Highest MTB	(5) Highest MTB	(6) Highest MTB
EPS_PF	-2.325***	-2.387***	-2.739***			
	(-8.057)	(-7.764)	(-7.073)			
EPS_MB				-2.006***	-2.041***	-2.308***
				(-8.607)	(-8.323)	(-7.552)
DISP	-3.919***	-3.998***	-4.227***	-3.390***	-3.439***	-3.696***
	(-9.007)	(-8.623)	(-8.288)	(-8.993)	(-8.848)	(-8.879)
SIZE	-0.026	-0.007	-0.102	-0.031	-0.008	-0.120
	(-0.174)	(-0.043)	(-0.656)	(-0.208)	(-0.051)	(-0.780)
LEV	0.959***	0.982***	0.974***	0.913***	0.936***	0.924***
	(11.692)	(11.997)	(9.123)	(10.934)	(11.350)	(8.595)
VOLA	1.870***	1.910***	2.147***	1.842***	1.886***	2.083***
	(9.002)	(9.520)	(8.683)	(9.208)	(9.832)	(9.053)
AF	0.006	0.005	0.002	0.007	0.006	0.006
	(0.520)	(0.476)	(0.148)	(0.747)	(0.653)	(0.540)
EPS_PF*DISP	3.610***	3.736***	3.859***			
	(6.575)	(6.430)	(5.508)			
EPS_MB*DISP				3.190***	3.254***	3.434***
				(6.436)	(6.143)	(5.501)
Observations	747	747	747	747	747	747
Fixed Effect	No	quarter	firm and quarter	No	quarter	firm and quarter
StdErr_Cluster	firm	firm	firm	firm	firm	firm
Panel B: Least overvalued stocks						
	(7) Lowest MTB	(8) Lowest MTB	(9) Lowest MTB	(10) Lowest MTB	(11) Lowest MTB	(12) Lowest MTB
EPS_PF	2.581***	2.691***	2.931***			
	(5.571)	(5.567)	(5.734)			
EPS_MB				2.691***	2.798***	3.078***
				(5.906)	(5.822)	(5.939)
DISP	5.267***	5.388***	5.561***	4.987***	5.082***	5.322***

	(8.748)	(8.586)	(8.188)	(9.894)	(9.624)	(9.251)
SIZE	0.018	0.014	0.135	0.011	-0.001	0.124
	(0.155)	(0.113)	(1.096)	(0.087)	(-0.012)	(0.976)
LEV	-0.475***	-0.488***	-0.477***	-0.456***	-0.464***	-0.445***
	(-7.763)	(-7.792)	(-6.402)	(-7.384)	(-7.352)	(-5.981)
VOLA	-1.812***	-1.851***	-2.104***	-1.887***	-1.925***	-2.161***
	(-4.507)	(-4.416)	(-4.795)	(-4.500)	(-4.426)	(-4.887)
AF	0.026**	0.029**	0.036***	0.029**	0.032**	0.038***
	(2.095)	(2.325)	(2.588)	(2.353)	(2.563)	(2.701)
EPS_PF*DISP	-4.404***	-4.602***	-4.678***			
	(-5.865)	(-5.943)	(-5.602)			
EPS_MB*DISP				-4.536***	-4.716***	-4.926***
				(-5.709)	(-5.613)	(-5.330)
Observations	747	747	747	747	747	747
Fixed Effect	No	quarter	firm and quarter	No	quarter	firm and quarter
StdErr_Cluster	firm	firm	firm	firm	firm	firm

Table 4. The forward effect of pro forma earnings disclosure on overvaluation in the following quarter

This table shows the regression results for the forward effect of pro forma earnings disclosure on overvaluation in the following quarter. The sample period of firm-quarter observations is from Q1/2011 to Q1/2017. *MTB* is the market-to-book ratio, *EPS_PF* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter, and 0 otherwise, *EPS_MB* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter that meet or beat analyst earnings forecasts while GAAP operating profit falls short of forecasts, and 0 otherwise, *DISP* is the standard deviation of analyst earnings forecasts scaled by the consensus mean earnings forecast, *SIZE* is firm size measured as market value of equity, *LEV* is leverage measured as total debt to total equity, *VOLA* is the firm's average return on assets volatility over a the past 5 years, *AF* is the number of analysts following the firm. All of the firm-specific variables are winsorized at the 1% and 99% levels. *z*-statistics are reported in parentheses under the estimation coefficient. ***, **, and * denote significance levels 1%, 5%, and 10%, respectively.

	(1) MTB_Q_{t+1}	(2) MTB_Q_{t+1}	(3) MTB_Q_{t+1}	(4) MTB_Q_{t+1}	(5) MTB_Q_{t+1}	(6) MTB_Q_{t+1}
EPS_PF	-0.648***	-0.748***	-1.127***			
	(-2.863)	(-3.104)	(-4.276)			
EPS_MB				-0.864***	-0.953***	-1.214***
				(-4.407)	(-4.172)	(-4.673)
DISP	-1.921***	-1.984***	-2.008***	-2.018***	-2.081***	-2.082***
	(-5.083)	(-5.255)	(-5.533)	(-5.427)	(-5.573)	(-5.962)
SIZE	0.408**	0.345**	0.119	0.416**	0.352**	0.139
	(2.501)	(2.268)	(0.685)	(2.558)	(2.338)	(0.818)
LEV	2.389***	2.414***	2.226***	2.375***	2.398***	2.213***
	(8.160)	(8.363)	(8.354)	(8.337)	(8.542)	(8.528)
VOLA	1.549***	1.532***	1.625***	1.559***	1.541***	1.604***
	(8.531)	(8.597)	(9.250)	(8.269)	(8.452)	(8.657)
AF	0.033***	0.038***	0.030***	0.033***	0.039***	0.034***
	(3.354)	(4.410)	(3.317)	(2.970)	(3.934)	(3.164)
Observations	715	715	715	715	715	715
Fixed Effect	No	quarter	firm and quarter	No	quarter	firm and quarter
StdErr_Cluster	firm	firm	firm	firm	firm	firm

Table 5. Logistic regression for the effect of pro forma disclosures on overvaluation: baseline results using Tobin's Q

This table shows the logistic regression results for the effect of pro forma disclosures on overvaluation for the baseline model using Tobin's Q instead of *MTB*. The sample period of firm-quarter observations is from Q1/2011 to Q1/2017. *EPS_PF* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter, and 0 otherwise, *EPS_MB* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter that meet or beat analyst earnings forecasts while GAAP operating profit falls short of forecasts, and 0 otherwise, *DISP* is the standard deviation of analyst earnings forecasts scaled by the consensus mean earnings forecast, *SIZE* is firm size measured as market value of equity, *LEV* is leverage measured as total debt to total equity, *VOLA* is the firm's average return on assets volatility over a the past 5 years, *AF* is the number of analysts following the firm. All of the firm-specific variables are winsorized at the 1% and 99% levels. *z*-statistics are reported in parentheses under the estimation

Panel A: Most overvalued stocks						
	(1) Highest TQ	(2) Highest TQ	(3) Highest TQ	(4) Highest TQ	(5) Highest TQ	(6) Highest TQ
EPS_PF	-1.099***	-1.145***	-1.585***			
	(-6.633)	(-6.900)	(-10.308)			
EPS_MB				-0.889***	-0.935***	-1.221***
				(-4.787)	(-4.983)	(-6.201)
DISPM	-2.586***	-2.620***	-3.006***	-2.548***	-2.578***	-2.895***
	(-7.782)	(-7.768)	(-8.590)	(-7.168)	(-7.095)	(-7.558)
SIZE	0.346***	0.359***	0.241*	0.341***	0.353***	0.245*
	(2.886)	(3.141)	(1.860)	(2.925)	(3.199)	(1.916)
LEV	-0.759***	-0.785***	-0.953***	-0.779***	-0.801***	-0.959***
	(-8.779)	(-9.057)	(-9.103)	(-9.365)	(-9.613)	(-9.468)
VOLA	1.348***	1.372***	1.692***	1.282***	1.312***	1.552***
	(6.287)	(6.337)	(7.051)	(6.305)	(6.350)	(6.811)
AF	0.001	0.002	-0.006	0.005	0.006	0.002
	(0.072)	(0.178)	(-0.525)	(0.490)	(0.597)	(0.175)
Observations	747	747	747	747	747	747
Fixed Effect	No	quarter	firm and quarter	No	quarter	firm and quarter
StdErr_Cluster	firm	firm	firm	firm	firm	firm
Panel B: Least overvalued stocks						
	(7) Lowest TQ	(8) Lowest TQ	(9) Lowest TQ	(10) Lowest TQ	(11) Lowest TQ	(12) Lowest TQ
EPS_PF	0.306	0.271	0.478**			
	(1.629)	(1.400)	(2.388)			
EPS_MB				0.099	0.065	0.129
				(0.433)	(0.274)	(0.478)
DISP	3.885***	4.012***	4.361***	3.845***	3.969***	4.257***
	(11.048)	(11.025)	(9.693)	(10.802)	(10.785)	(9.559)
SIZE	-0.489***	-0.544***	-0.366***	-0.475***	-0.532***	-0.359**
	(-4.192)	(-4.330)	(-2.632)	(-3.979)	(-4.101)	(-2.498)
LEV	1.316***	1.424***	1.606***	1.322***	1.432***	1.612***
	(9.965)	(9.036)	(8.868)	(9.911)	(9.031)	(8.748)
VOLA	-2.607***	-2.725***	-3.055***	-2.562***	-2.682***	-2.959***

	(-6.607)	(-6.152)	(-6.598)	(-6.626)	(-6.190)	(-6.702)
AF	-0.003	-0.001	0.007	-0.006	-0.003	0.002
	(-0.243)	(-0.039)	(0.382)	(-0.435)	(-0.210)	(0.121)
Observations	747	747	747	747	747	747
Fixed Effect	No	quarter	firm and quarter	No	quarter	firm and quarter
StdErr_Cluster	firm	firm	firm	firm	firm	firm

Table 6. Results for the effect of the interaction between analyst earnings forecast dispersion and pro forma disclosures on overvaluation using Tobin's Q

This table shows table shows the logistic regression results for the effect of the interaction between analyst earnings forecast dispersion and pro forma disclosures on overvaluation using Tobin's Q instead of *MTB.* The sample period of firm-quarter observations is from Q1/2011 to Q1/2017. *EPS_PF* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter, and 0 otherwise, *EPS_MB* is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter that meet or beat analyst earnings forecasts while GAAP operating profit falls short of forecasts, and 0 otherwise, *DISP* is the standard deviation of analyst earnings forecasts scaled by the consensus mean earnings forecast, *SIZE* is firm size measured as market value of equity, *LEV* is leverage measured as total debt to total equity, *VOLA* is the firm's average return on assets volatility over a the past 5 years, *AF* is the number of analysts following the firm. All of the firm-specific variables are winsorized at the 1% and 99% levels. *z*-statistics are reported in parentheses under the estimation coefficient. ***, **, and * denote significance levels 1%, 5%, and 10%, respectively.

Panel A: Most overvalued stocks						
	(1) Highest TQ	(2) Highest TQ	(3) Highest TQ	(4) Highest TQ	(5) Highest TQ	(6) Highest TQ
EPS_PF	-2.188***	-2.345***	-2.882***			
	(-5.459)	(-5.758)	(-6.747)			
EPS_MB				-2.059***	-2.220***	-2.596***
				(-5.884)	(-6.033)	(-7.121)
DISP	-3.769***	-3.917***	-4.414***	-3.657***	-3.797***	-4.199***
	(-7.972)	(-8.177)	(-8.720)	(-8.266)	(-8.165)	(-8.693)
SIZE	0.410***	0.424***	0.327**	0.418***	0.435***	0.344**
	(3.107)	(3.365)	(2.226)	(3.280)	(3.604)	(2.406)
LEV	-0.784***	-0.820***	-0.966***	-0.822***	-0.861***	-1.007***
	(-9.197)	(-9.875)	(-9.326)	(-10.235)	(-10.965)	(-9.862)
VOLA	1.339***	1.375***	1.684***	1.306***	1.348***	1.580***
	(6.594)	(6.632)	(7.393)	(6.549)	(6.657)	(7.140)
AF	0.001	0.001	-0.006	0.004	0.004	0.001
	(0.076)	(0.152)	(-0.537)	(0.420)	(0.493)	(0.074)
EPS_PF*DISP	2.551***	2.766***	2.919***			
	(3.606)	(3.720)	(3.451)			
EPS_BM*DISP				2.820***	3.057***	3.228***
				(3.962)	(3.921)	(3.985)
Observations	747	747	747	747	747	747
Fixed Effect	No	quarter	firm and quarter	No	quarter	firm and quarter
StdErr_Cluster	firm	firm	firm	firm	firm	firm
Panel B: Least overvalued stocks						
	(7) Lowest TQ	(8) Lowest TQ	(9) Lowest TQ	(10) Lowest TQ	(11) Lowest TQ	(12) Lowest TQ
EPS_PF	0.483	0.424	0.502			
	(0.997)	(0.828)	(0.815)			
EPS_MB				0.289	0.240	0.269
				(0.604)	(0.484)	(0.450)
DISP	4.057***	4.159***	4.383***	3.989***	4.101***	4.362***

	(11.016)	(10.062)	(10.138)	(12.227)	(12.252)	(11.658)
SIZE	-0.498***	-0.551***	-0.368**	-0.486***	-0.541***	-0.368**
	(-4.267)	(-4.451)	(-2.524)	(-4.054)	(-4.198)	(-2.421)
LEV	1.317***	1.424***	1.605***	1.326***	1.435***	1.614***
	(9.996)	(9.062)	(8.794)	(10.181)	(9.221)	(8.967)
VOLA	-2.599***	-2.718***	-3.054***	-2.561***	-2.679***	-2.958***
	(-6.660)	(-6.234)	(-6.650)	(-6.644)	(-6.226)	(-6.732)
AF	-0.003	-0.000	0.007	-0.005	-0.003	0.003
	(-0.202)	(-0.011)	(0.387)	(-0.387)	(-0.168)	(0.152)
EPS_PF*DISP	-0.327	-0.281	-0.043			
	(-0.388)	(-0.312)	(-0.041)			
EPS_BM*DISP				-0.360	-0.331	-0.263
				(-0.424)	(-0.372)	(-0.248)
Observations	747	747	747	747	747	747
Fixed Effect	No	quarter	firm and quarter	No	quarter	firm and quarter
StdErr_Cluster	firm	firm	firm	firm	firm	firm