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The Age of Cheap Money and Passive Investing: Are Pro Forma Earnings Value Relevant?

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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 since 2008 that are challenging the traditional primacy of accounting disclosures for valuation, I link mispriced shares to voluntary firm disclosures. 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, I find that providing pro forma earnings reduces overvaluation for the most overvalued stocks. Further analysis indicates, however, that for firms with higher analyst earnings forecast dispersion, disclosing pro forma earnings increases these firms' overvaluation. In addition, different types of expenses excluded to meet or beat analyst earnings forecasts affect misvaluation differently. These findings suggest that pro forma earnings still play an important role and are value relevant in the new market conditions.

JEL classification numbers: G38, M40, M41

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

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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 [11]; Brown, Christensen, Elliott, and Mergenthaler, 2012 [21]; Isidro and Marques, 2015 [44]; Christensen, Pei, Pierce, and Tan, 2019 [25]; Kyung, Lee, and Marquardt, 2019 [48]), less attention has been paid to the effect of such pro forma disclosures on the market's perception of firm value. This study examines the effect of such voluntary disclosures on 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 (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, Black, Christensen, and Mergenthaler, 2007) [10]. The firms' 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) [10]. Critics, however, 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 [24]; Black and Christensen, 2009 [11]). When the market is able to see through opportunistic motives and considers disclosures to be not credible, firms get penalized with a negative reaction, i.e. lower share price (Landsman, Miller, and Yeh, 2007 [50]; Doyle, Jennings, and Soliman, 2013 [33]; Whipple, 2015 [64]; Black, Christensen, Ciesielski, and Whipple, 2018b [15]). If, however, the market can be misled, then there is potentially an element of mispricing related to pro forma earnings. Having said that, investors and analysts still widely use these adjustments for analyzing firm performance and for making investment decisions. This practice can therefore result in misallocation of capital, particularly by less sophisticated investors who are more susceptible to being misled than professionals (Bhattacharya et al., 2007) [10].

Early studies on the value relevance of pro forma earnings disclosures have provided some evidence that such adjusted earnings have incremental information content (e.g. Bradshaw and Sloan, 2002 [17]; Bhattacharya, Black, Christensen, & Larson, 2003 [9]; Lougee and Marquardt, 2004 [55]; Fredrickson and Miller, 2004 [36]) and may be linked to mispricing (e.g. Hirshleifer and Teoh, 2003 [41]; Doyle, Lundholm, and Soliman, 2003 [32]).

Since that early evidence, pro forma disclosures have become subject to much more stringent regulations. A recent substantial increase in the use of pro forma earnings disclosures has led US regulators to apply greater scrutiny and modified guidelines²,

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 [12], 2018b [15]) also find that while stricter regulations have curbed the use

along with a number of new regulations to better regulate and curb their use in the wake of this increase (Zhang and Zheng, 2011 [68]; Black et al., 2018b [15]). This has led to increased quality and informativeness of disclosures, reduced information asymmetry, and investors consider them to be more credible (Black et al., 2018b [15]; Huang and Skantz, 2016 [42]). Recent research confirms the value relevance of pro forma numbers (e.g. Venter, Emanuel, and Cahan, 2014 [62]; Bradshaw, Christensen, Gee, and Whipple, 2018a [18]; Leung and Veenman, 2018 [54]) and suggests that those changes have significantly reduced the potential for misleading investors. Numerous studies do not find evidence for mispricing of pro forma disclosures for the period after the changes (Zhang and Zheng, 2011 [68]; Jennings and Marques, 2011 [45]; Whipple, 2015 [64]). Nevertheless, aggressive disclosures and opportunistic motives behind providing pro forma earnings can still be found (Black et al., 2018b [15]; Bradshaw et al., 2018a [18]; Curtis et al., 2014 [27]).

The existing evidence, however, has one major limitation. As highlighted by Black et al. (2018b) [15], related studies were mostly based on data from the late 1990s or early 2000s. Only few papers have partially covered some post-financial crisis data periods (e.g., Black et al., 2018b [15]; Leung and Veenman, 2018 [54]; Bentley, Christensen, Gee, and Whipple, 2018 [8]). This matters because, since the bulk of existing research was done, the environment for stock market investing has undergone radical changes. Those developments have major impact on mispricing, and cast a doubt on the value relevance of disclosures, including pro forma earnings. Prior studies did not capture those changes in financial markets in the last few years. Since the financial crisis in the late 2000s 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 two important consequences for mispricing of shares. First, it 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.³ Second, firms can also borrow money from banks easily and cheaply. Consequently, 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) [57] and Klein et al.

of pro forma earnings disclosures, their use is still widespread. Bentley et al. (2018) [8] also report a substantial increase in recent years.

³ 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.

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

(2002) [47] show that debt and changes in debt and capital structure affect misvaluation. More specifically, in the current context, the main avenue for utilising those record funds has been share buybacks. Firms have launched significant share buyback programmes that are approaching record highs⁵ which boosts demand for shares and provides upward support to price. This one-way demand (purchase only) thus introduces another source of potential mispricing enabled by current financing conditions.

In addition, another major factor that raises the mispricing potential is that the way to invest in the stock market has changed considerably in the last few years. There has been a stellar increase in stock market investments via Exchange Traded Funds (ETFs)⁶, 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, 2011 [65]; Belasco, Finke, and Nanigian, 2012 [7]; Da and Shive, 2018 [28]).

Thus, taken together, the very recent emergence of powerful additional forces that can cause stock mispricing (index investing, buybacks, large sums of money in search of investment) has clear implications for the usefulness of voluntary pro forma earnings: They all point to reduced relevance for such information. In light of these strong new forces, this study assesses whether pro forma earnings, considered to help more accurately price shares, affect stock misvaluation. Specifically, I ask: Are pro forma earnings still value relevant in this new market environment?

Additionally, I also examine the usefulness of pro forma earnings disclosure for firms with high analyst earnings forecast disagreement. Dispersion in analyst earnings per share forecasts, as a proxy for information uncertainty about the earnings leads to mispricing of shares, especially to overvaluation (see e.g. Ackert and Athanassakos, 1997 [1]; Athanassakos and Kalimipalli, 2003 [3]; Zhang, 2006 [67]; Sadka and Scherbina, 2007 [58]). For high uncertainty stocks, the additional information provided by pro forma disclosures will be of particular importance for pricing shares. I therefore analyse the effect of disclosing pro forma earnings on mispricing of those stocks.

I 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

rising debt", *The Wall Street Journal*, May 3, 2015.

⁵ Ben Eisen and Akane Otani, "Record Buybacks Help Steady Wobbly Market", *The Wall Street Journal*, May 10, 2018.

⁶ 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.

firm's market-to-book ratio (MTB). The analysis is based on Dow Jones 30 firms as these firms are large and among the most recognizable and well-known companies (e.g. Apple Inc., Microsoft Inc.). A non-negligible percentage of the cheap funds made available by central 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 ETFs⁷ whose use as a way to get equity exposure has grown significantly in recent years. Consequently, 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, 2011) [65], for instance by affecting Tobin's Q (e.g. Yang and Morck, 2001) [66], this sample is particularly suitable.

The analysis provides strong evidence to show that pro forma earnings are still value relevant. They reduce overvaluation for the most overvalued stocks but not for the least overvalued stocks. Also, pro forma earnings are 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. The finding of a negative effect suggests, in line with previous studies, that pro forma disclosures may backfire as investors seem to be able to see through opportunistic disclosures and assign a lower share valuation. At least, for some firms. Thus firms might want to be careful with pro forma disclosures, as the market seems to be able to filter out misleading disclosures and react accordingly.

In addition, further analysis shows that, for firms with higher analyst earnings forecast dispersion, disclosing pro forma earnings increases overvaluation. This is likely to happen due to investors' over-expectation and uncertainty. The least overvalued firms, however, would see decreased overvaluation in the presence of higher analyst earnings forecast dispersion. Those findings are consistent with the evidence in Bradshaw, Plumlee, Whipple, and Yohn (2018b) [19] that non-GAAP earnings decrease analyst consensus about future performance. It suggests that, in the presence of higher ex-ante uncertainty among analysts about a firm's performance, pro forma earnings (which may also be an attempt to mislead) may be particularly difficult to interpret in their effect on performance. Hence they could potentially add to the existing uncertainty, and this amplified uncertainty could increase mispricing for some stocks.

This study contributes to the literature in three ways. First, the findings fill a gap in the literature that has arisen due to the significant changes in the market environment in the last few years after the financial crisis. I offer a contemporary

⁷ 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.

look at the relationship between pro forma earnings disclosures and pricing of shares, focusing on misvaluation. I extend previous literature by examining a very recent sample period that has hardly been covered in prior studies, but which is characterised by a market environment that is radically different from existing studies' samples. New and powerful sources of mispricing have emerged during this period that call into question the usefulness of pro forma earnings disclosures for pricing shares. I demonstrate that, despite the significant changes in the monetary environment and investing approach that seem to reduce the need for fundamental information, pro forma earnings disclosures still provide value relevant information that can help reduce mispricing of shares. More generally, it also sheds light on the effects of unconventional monetary policy in the wake of the financial crisis on the usefulness of accounting information.

Second, my investigation is particularly timely in light of increasing attention being paid by standard setters and regulators to whether accounting disclosures provide information to meet investors' needs. This is against the background of now widespread provision and use of pro forma numbers by investors, and corresponding initiatives of how to modify existing reporting, whether it still meets the needs of users, and the quality of pro forma information (see Black, Christensen, Kiosse, and Steffen, 2017a) [12]. The findings are relevant for regulators to consider whether the changes in regulations regarding non-GAAP disclosures have been effective, or may need to be further revised. The results show that the market seems to be, to some extent, able to detect opportunistic disclosures and penalizes firms accordingly. Third, I provide evidence for the effect of pro forma earnings on misvaluation for stocks with high prior analyst earnings forecast disagreement, which has not been considered before in the literature. I show that, for stocks with high prior disagreement amongst analysts regarding the upcoming earnings numbers, providing pro forma earnings information may add to the uncertainty, and thereby exacerbate misvaluation. This provides further detail and insight into how, and under which circumstances, such disclosures affect share price, and can help inform decisions by both firms and regulatory bodies.

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 usefulness of pro forma earnings for share valuation

Early studies have examined the question of the valuation relevance of pro forma earnings disclosures by mostly looking at their association with earnings announcements and future stock returns (e.g. Bradshaw and Sloan, 2002 [17]; Bhattacharya et al., 2003 [9]; Brown and Sivakumar, 2003 [20]; Doyle et al., 2003 [32]; Lougee and Marquardt, 2004 [55]). They provide evidence that pro forma earnings disclosures contain incremental information content above GAAP earnings.

For instance, Brown and Sivakumar (2003) [20] 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. Bhattacharya et al. (2003) [9] 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. More recent research has confirmed the value relevance of those disclosures (e.g. Venter et al., 2014 [62]; Bradshaw et al., 2018a [18]; Leung and Veenman, 2018 [54]).

Examining the question of who uses pro forma disclosures, some studies (e.g. Fredrickson and Miller, 2004 [36]; Elliott, 2006 [34]) show that it is mostly less sophisticated investors whose stock valuations and investment decisions are influenced by pro forma earnings disclosures. Evidence has come from experiments (e.g. Fredrickson and Miller, 2004 [36]; Elliott, 2006 [34]) and empirical studies such as Bhattacharya et al. (2007) [10] and Allee, Bhattacharya, Black, and Christensen (2007) [2], who confirm that market reactions to pro forma earnings stem chiefly from less sophisticated investors, who buy on the pro forma information. Furthermore, analysts are another major user group (see Black et al., 2018b [15]).

Closer related to my paper, a number of studies have looked at the relationship of pro forma earnings and mispricing. The results are mixed. While some studies find that components of pro forma earnings disclosure can be mispriced, others find no mispricing effect, especially for the period after the introduction of stricter US regulations in 2003. Finally, there is also evidence that pro forma earnings help the market in price discovery. Thus the latter findings support the view that pro forma earnings are disclosed to be informative, not misleading.

For instance, Bradshaw and Sloan (2002) [17] 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. (2018b) [19] also show that pro forma earnings can decrease investor consensus about future performance and thus increase mispricing. Moreover, Hirshleifer and Teoh (2003) [41] 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. Focusing on expenses exclusions made to arrive at pro forma earnings, Doyle et al. (2003) [32] show that investors underreact to other (non-recurring, non-cash) exclusions at the earnings announcement and correct this mispricing over the subsequent three years. Similarly, Landsman et al. (2007) [50] separate *Total Exclusions* to earnings into *Special Items* and *Other Exclusions*. Using a sample from 1990-2000, they show that the market misprices them in different ways. *Special Items* seem to be

underpriced while *Total Exclusions* seem to be perceived negatively. Moreover, stocks with positive *Other Exclusions* are overvalued.

By contrast, Johnson and Schwartz (2005) [46], in their sample of 253 pro forma press releases during one quarter (June-August) of the year 2000, find no differences in stock valuations and stock return premiums linked to pro forma announcements between firms disclosing pro forma earnings and those that do not. While they find that both the most overvalued and undervalued sample stocks are overpriced, this was unrelated to pro forma disclosure.

Compared to earlier research, however, more recent studies (e.g. Zhang and Zheng, 2011 [68]; Jennings and Marques, 2011 [45]; Doyle et al., 2013 [33]; Whipple, 2015 [64]) do not find strong evidence of mispricing. For instance, Zhang and Zheng (2011) [68] 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. Similarly, Jennings and Marques (2011) [45] do not find evidence that investors were misled in the post Regulation G period. Doyle et al. (2013) [33] 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, as positive earnings surprises are discounted when they are accompanied by exclusions from GAAP earnings. Whipple (2015) [64] uses data from 2004 to 2012 and shows that investors' response to non-GAAP non-cash exclusions is much stronger than the response to the other exclusions surprise, suggesting investors heavily discount other exclusions when valuing firm performance. Moreover, the market responds at the earnings announcement, with no evidence for mispricing that is corrected in subsequent periods. On the other hand, evidence that pro forma earnings help the market price shares more accurately has come from Huang and Skantz (2016) [42]. Their findings based on a sample from 1999-2006 suggest that pro forma earnings improve price discovery and reduce information asymmetry after the earnings announcement.

The shortcoming of existing evidence is that most of the studies used data from the latter half of the 1990s, or early 2000s, so those findings appear dated. This is because, 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 [12], 2018b [15]), and the aforementioned changes in the market that have potentially meaningfully changed the landscape. While the new regulations have arguably improved the usefulness of pro forma disclosures by significantly reducing the potential for misleading investors (and thereby mispricing), the changes in the market environment have introduced additional sources of mispricing that call into question the need and usefulness of pro forma earnings to price shares. Existing evidence has mostly been gathered before those changes took place, thus limiting their relevance in today's market environment. Moreover, existing studies tended to look at the mispricing effect in the cross-section of firms, that is the average effect. This, however, may

mask differences in the effect depending on the level of mispricing. A more detailed analysis is therefore required.

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 [22]; Healy and Palepu, 1993 [39]; Lamont and Thaler, 2003 [49]; Shiller, 2003 [60]; Bloomfield and Michaely, 2004 [16]). 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) [40]. 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) [40]. Further, Ackert and Athanassakos (1997) [1] find positive abnormal returns from buying (selling) low (high) dispersion stocks at the beginning of the year. Similarly, Sadka and Scherbina (2007) [58] 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, Hirshleifer, and Teoh, 2001 [29]; De Long, Shleifer, Summers, and Waldmann, 1990 [30]; Schleifer and Vishny, 1997 [61]; Lee, Myers, and Swaminathan, 1999 [51]; Elliott, Krische, and Peecher, 2010 [35]). From a behavioral finance perspective, misvaluation can be induced by investor irrationality (see e.g., Barberis and Thaler, 2003 [6]; Baker and Wurgler, 2002 [5]). Psychological explanations for biases leading to irrational investor behavior and mispricing include overconfidence, optimism, representativeness, conservatism, or belief perseverance (Barberis and Thaler, 2003 [6]; Baker and Wurgler, 2002 [5]). No matter the underlying reason, the result is mispriced shares. While some prior studies have examined the effect of pro forma disclosures on share valuation, changes during the last decade in the area of monetary policy and investment strategies and corporate finance have introduced new sources of misvaluation. These are challenging the dominant role of accounting information as a basis for valuation purposes.

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.⁸ 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, 2011 [65]; Yang and Morck, 2001 [66]). 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 [57]; Klein et al., 2002 [47]), so that the question of how pro forma disclosures can help address this increased potential misvaluation component has to be reconsidered.

Disclosure of accounting information is meant to reduce information asymmetry and help investors price shares accurately (e.g. Lev, 1992 [53]; Healy and Palepu, 2001 [40]). Pro forma earnings, not required by GAAP, can be an additional source of information for valuation purposes. For instance, they can provide a more precise picture of firm performance and 'core earnings' (Weil, 2001 [63]; Bhattacharya et al., 2003 [9]; Bhattacharya et al., 2007 [10]), which should make it easier for investors to judge performance and therefore value (Bhattacharya et al., 2003) [9]. Such additional information beyond the mandatory level should help reduce the magnitude of stock misvaluation, 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 portrayal of underlying performance, this can enable investors to price shares more accurately, thus reduce misvaluation.

Disclosure decisions are often taken opportunistically to achieve a certain purpose (Graham, Harvey, and Rajgopal, 2005) [37]. In fact, both Healy and Palepu (2001) [40] and Graham et al. (2005) [37] highlight that stock misvaluation is an important motivation in management's disclosure decisions. Targeting misvaluation is therefore a major driver of disclosure, including perceived undervaluation (Healy and Palepu, 2001 [40]; Graham et al., 2005 [37]). Despite a tightening of regulations to reduce the scope for misleading disclosures, the debate about whether pro forma earnings are informative or opportunistic is still ongoing, thus whether they can help price shares more accurately.

The issue of usefulness has recently taken on another dimension due to major developments in the market environment that have introduced significant additional potential for misvaluation. Those changes raise again the question: What is the role of disclosures, especially voluntary, in this new situation? Are voluntary pro forma earnings disclosures useful for valuation in this context, and can they help price shares more accurately?

In addition to that, my study also addresses a second question. I investigate the usefulness of pro forma earnings disclosure for firms with high analyst earnings

⁸ Donal O'Mahoney, "Central bank policies distort market signals", *ft.com*, March 9, 2016.

forecast disagreement. 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 [1]; Athanassakos and Kalimipalli, 2003 [3]; Zhang, 2006 [67]; Sadka and Scherbina, 2007 [58]). 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 [1]; Zhang, 2006 [67]). 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.⁹ Thus, with greater (lower) uncertainty surrounding the firm, analysts are less concerned with their reputation when issuing optimistic forecasts, which results in overvaluation (undervaluation) (Ackert and Athanassakos, 1997) [1]. For stocks with high uncertainty prior to the earnings announcement, the additional information provided by pro forma disclosures will be of particular importance to reduce uncertainty ex post and price shares more accurately, that is mispricing. 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.

3. Sample, data, and empirical methods

3.1 Sample of pro forma earnings press releases

Quarterly earnings press releases of the constituents of the Dow Jones 30 are hand-collected for the period Q1 2011 to Q1 2017. There is a surge in the use of adjusted earnings numbers during this period. Press releases were retrieved by searching PR Newswire and Business Wire on LexisNexis and all available adjusted earnings figures hand-collected from the releases. Press releases were searched for the keywords “pro forma”, “pro-forma”, “proforma”, and other frequently used terms.¹⁰ I 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. Firms with negative book value of assets and book value of equity in a given year are excluded. I also require observations to have valid data for computing stock misvaluation proxies. This process results in a final sample of 747 observations (firm-quarters).

⁹ 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 [1]; Athanassakos and Kalimipalli, 2003 [3]).

¹⁰ Consistent with prior research (e.g. Brown et al., 2012 [21]; Black et al, 2018a [14]) I 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’.

3.2 Measurement of variables

3.2.1 Stock misvaluation measurement

I 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 [5]; Johnson and Schwartz, 2005 [46]; Dong, Hirshleifer, Richardson, and Teoh, 2006 [31]; Hassan, Romilly, Giorgioni, and Power, 2009 [38]). For 97% of all firm quarter observations in my sample, $MTB > 1$, with an average *MTB* of 4.5 (see descriptive statistics in 3.4). A high *MTB* is an indicator for overvaluation (Cole, Helwege, and Laster, 1996 [26]; Bloomfield and Michaely, 2004 [16]; Chi and Gupta, 2009 [23]). Lee and Swaminathan (1999) [52] and Lee et al. (1999) [51] report values for historical averages for Dow Jones *MTB* as 1.71, along with a range between 1 - 3.5. A value of 4.3 was considered overvalued. Similarly, Cole et al. (1996) [26] suggest that, for the S&P500, an average *MTB* of 4 or more can be considered overvalued, given a historical average of less than 2. This suggests that, on the whole, my sample observations are overvalued. This is also consistent with prior studies showing that a link between pro forma disclosures and misvaluation is found in the top or bottom tails of the distribution, the most overvalued (undervalued) stocks (e.g. Johnson and Schwartz, 2005) [46]. In this study, I examine the top and bottom distribution groups to separate firms that are most overvalued from those merely overvalued (the highest vs the lowest third of overvaluation). To measure overvaluation, I rank firms on *MTB* from highest to lowest in each quarter. Firms are then classified into the top third of the distribution (most overvalued) and bottom third (least overvalued) to study the effect of pro forma earnings on misvaluation.¹¹

3.2.2 Pro forma earnings disclosures and control variables

To investigate the effect of firms' pro forma earnings disclosure on overvaluation, I use two proxies frequently used in the literature (e.g. Brown et al., 2012 [21]; Black and Christensen, 2009 [11]; Black et al., 2017a [12]; Black, Black, Christensen, and Gee, 2018a [14]; Isidro and Marques, 2015 [44]).¹² First, to gauge the general effect, I 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, I measure whether the pro forma earnings number allows the firm to meet or beat analyst earnings forecasts. I create an indicator variable, *EPS_MB*, that takes the value of 1 if the

¹¹ Other studies use a similar approach to identify overvalued (undervalued) firms (e.g. Sawicki and Shreshta, 2014 [59]; Badertscher, 2011 [4]).

¹² Initially I 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. This variable was therefore dropped from the analysis.

firm's pro forma earnings allow it to meet or beat the mean analyst earnings forecast despite a miss on forecasted GAAP numbers, and 0 otherwise.

I also include a number of controls for firm-specific characteristics (see e.g. Zhang, 2006 [67]; Badertscher, 2011 [4]; Chi and Gupta, 2009 [23]; Hassan et al., 2009 [38]): 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.

3.3 Regression model

To examine the effect of pro forma disclosures on overvaluation, a logit model is used. 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 the overvaluation measure, and *PROFORMA* is the pro forma earnings measure (either *EPS_PF* or *EPS_MB*). The remaining variables are the controls.

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

Table 1: Descriptive statistics

	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

This table shows descriptive statistics for the market-to-book (*MTB*) ratio, the two 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 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.

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, there are only 23 quarterly observations in the sample with *MTB*<1, so that 97% of quarterly observations are overvalued based on *MTB*. This supports my 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 the 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 there are both low volatility and high volatility stocks on the sample. Finally, the sample firms are followed by 24 analysts on average (*AF*). This

Panel B: Least overvalued stocks						
	(7)	(8)	(9)	(10)	(11)	(12)
	Lowest MTB	Lowest MTB	Lowest MTB	Lowest MTB	Lowest MTB	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

This 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 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.

In columns 1 to 3 of Panel A, for the most overvalued stocks, we can see 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) [10]. This is consistent with prior evidence (e.g. Huang and Skantz, 2016) [42] showing that pro forma disclosures can reduce information asymmetry to help price shares more accurately. It is also possible that the market may perceive some firms' disclosures as opportunistic, and therefore react negatively. 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) [9] who report that investors perceive this type of pro forma earnings to be less informative, and Doyle et al. (2013) [33] showing that investors discount positive earnings surprises when accompanied by exclusions from GAAP earnings. The results for the 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, there is not 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), there is 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, I 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, I include an interaction term between analyst earnings forecast dispersion and the pro forma earnings measure in the 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.

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

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	-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)	(8)	(9)	(10)	(11)	(12)
	Lowest MTB	Lowest MTB	Lowest MTB	Lowest MTB	Lowest MTB	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

This 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 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.

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 [1]; Athanassakos and Kalimipalli, 2003 [3]). High uncertainty makes it easier for analysts to issue optimistic forecasts (Ackert and Athanassakos, 1997 [1]), and analysts being less certain implies that potentially the information might be more difficult to interpret to value shares precisely. It is possible that pro forma numbers issued by such firms could also be interpreted in different ways (or more difficult to interpret) by the market and thereby add to uncertainty. This, in turn, would amplify overvaluation. In addition, Bradshaw et al. (2018b) [19] show that pro forma earnings decrease analyst consensus about future performance, which may also amplify existing uncertainty.

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 adds 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 the 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 see that providing adjusted earnings reduces overvaluation (1% level) for this group of stocks, suggesting that providing pro forma earnings that enable firms to meet or beat analyst earnings forecasts when GAAP earnings fall short of forecasts can help price shares more accurately for high uncertainty stocks.

4.3 Additional tests

I carry out a number of further tests to provide additional evidence and test the robustness of our results. First, it is possible the market may take time to fully incorporate the information into prices. I therefore test the effect of pro forma disclosure on misvaluation one quarter after the earnings release. Table 4 presents the results of the tests of the effect of pro forma disclosure on overvaluation one quarter ahead, thus whether adjusted earnings affect overvaluation in t_{+1} . I 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} .¹³

In columns 1 to 3 of Table 4, we can 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

¹³ The sample ends in Q1 2017, thus I do not have observations for Q2 2017 to calculate Q_{1t+1} for 2017.

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.

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

	(1)	(2)	(3)	(4)	(5)	(6)
	MTB_ Q_{t+1}	MTB_ Q_{t+1}	MTB_ Q_{t+1}	MTB_ Q_{t+1}	MTB_ Q_{t+1}	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

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 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.

The second additional analysis is to test the robustness of the results to the choice of misvaluation measure. Tobin's Q is another measure for misvaluation frequently

Panel B: Least overvalued stocks						
	(7)	(8)	(9)	(10)	(11)	(12)
	Lowest TQ	Lowest TQ	Lowest TQ	Lowest TQ	Lowest TQ	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	-	-	-	-	-	-0.359**
	0.489***	0.544***	0.366***	0.475***	0.532***	
	(-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

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 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

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 the robustness tests qualitatively support the main results that pro forma earnings

disclosure reduces misvaluation for overvalued stocks.

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

Panel A: Most overvalued stocks						
	(1)	(2)	(3)	(4)	(5)	(6)
	Highest TQ	Highest TQ	Highest TQ	Highest TQ	Highest TQ	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)	(8)	(9)	(10)	(11)	(12)
	Lowest TQ	Lowest TQ	Lowest TQ	Lowest TQ	Lowest TQ	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
This 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 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.						

Third, to provide more detail on the valuation effect of pro forma earnings, I restrict pro forma earnings to those that are higher than their reported GAAP quarterly operating profit (*EPS_GAAPBeat*). These make up 40% of pro forma earnings disclosed in the sample.¹⁴ The results are presented in Table 7. For the most overvalued firms (column 1-3) we can see that the results are not only consistent with the findings for the other pro forma measures, but the coefficients become even stronger. That means the strongest negative effect on overvaluation occurs when firms provide pro forma earnings that exceed GAAP earnings. It seems the market perceives such earnings as a negative signal for firm valuation for the most overvalued firms and therefore applies a larger discount. This may be driven by concerns about their credibility.

When focusing on the least overvalued firms (column 4-6) we see a significant positive effect on overpricing. This suggests that, while in general providing pro forma earnings does not affect valuation of the least overvalued firms, pro forma numbers that are higher than the reported GAAP numbers leads to increased overvaluation for the least overvalued firms. These results are similar to Johnson and Schwartz (2005) [46] who find that their pro forma disclosing firms with the lowest market values are overpriced.

¹⁴ Prior studies suggest that when pro forma earnings are higher than GAAP earnings investors may be misled and overestimate actual performance (see e.g. Bhattacharya et al., 2007 [10]; Doyle et al. (2003 [32], 2013 [33])).

Table 7: Logistic regression for the effect on overvaluation of pro forma earnings disclosures that beat reported quarterly GAAP operating earnings

	(1)	(2)	(3)	(4)	(5)	(6)
	Highest MTB	Highest MTB	Highest MTB	Lowest MTB	Lowest MTB	Lowest MTB
EPS_GAAPBeat	-0.845***	-0.850***	-1.104***	0.392**	0.390**	0.558***
	(-4.916)	(-4.950)	(-5.154)	(2.436)	(2.365)	(3.377)
DISP	-2.304***	-2.326***	-2.505***	3.028***	3.038***	3.213***
	(-7.348)	(-7.512)	(-7.807)	(11.404)	(11.269)	(10.334)
SIZE	-0.068	-0.056	-0.204	0.063	0.059	0.204*
	(-0.514)	(-0.400)	(-1.541)	(0.573)	(0.513)	(1.836)
LEV	0.919***	0.942***	0.926***	-0.452***	-0.460***	-0.442***
	(11.216)	(11.940)	(8.959)	(-7.443)	(-7.628)	(-6.091)
VOLA	1.894***	1.944***	2.171***	-1.989***	-2.025***	-2.267***
	(9.208)	(9.778)	(9.080)	(-4.636)	(-4.603)	(-5.056)
AF	0.001	0.001	-0.000	0.034***	0.036***	0.043***
	(0.132)	(0.072)	(-0.041)	(2.624)	(2.721)	(2.880)
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

This 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_GAAPBeat is a dummy variable taking the value of 1 if a firm discloses pro forma earnings in a given quarter that are higher than their reported quarterly GAAP operating profit, 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 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.

Fourth, prior studies show that different types of expenses exclusions are priced differently by the market, with some exclusions seemingly underpriced and others overpriced (e.g. Landsman et al., 2007 [50]; Doyle et al., 2013 [33]), so I explore potential effects on mispricing. As in Doyle et al. (2013) [33] I focus on the effect for firms that meet or beat analyst earnings forecasts (*EPS_MB*) using income-increasing exclusions. Doyle et al. (2013) [32] find that investors discount them, potentially since such exclusions are considered less credible. I follow previous studies (see Doyle et al., 2013 [33]; Landsman et al., 2007 [50], for details) and first calculate total exclusions to then decompose them. First, to generate *Total Exclusions*, the firm's GAAP operating earnings per share (*EPS_GAAP*) are subtracted from its Pro forma earnings (*EPS_PF*) and subsequently *Special Items*

are subtracted from *Total Exclusions* to arrive at *Other Exclusions*.¹⁵ Interaction terms are created to identify firms with income-increasing exclusions (*Total Exclusions*, *Special Items*, *Other Exclusions*, respectively) that meet or beat analyst earnings forecasts, which replace the EPS_{MB} measure in separate regressions for each exclusion type.

The descriptive statistics (not reported) show that the mean value of *Total Exclusions* in my sample is negative (-0.829), thus firms on average seem to exclude gains so that pro forma earnings are lower than operating earnings. This is consistent with my earlier finding that for less than half of observations (40%) pro forma numbers are higher than GAAP earnings, thus the majority of firms reporting income-decreasing adjustments. Further, *Total Exclusions* are virtually completely composed of *Other Exclusions* (-0.899), with only a small contribution of *Special Items* (0.070).

Table 8 shows the results. Panel A displays the results for *Total Exclusions*, while Panel B and Panel C present the results for *Other Exclusions* and *Special Items*, respectively. Looking at Panel A, we can see in columns 1-3 (most overvalued stocks) that, per se, excluding expenses to meet or beat forecasts does not affect overvaluation. There is a slight positive effect for the least overvalued firms (columns 4-6), which disappears once firm and quarter fixed effects are introduced. Thus overall, total expense exclusions considered in aggregate (all exclusions combined) have no effect on misvaluation.

The picture, however, is quite different when we disaggregate total exclusions and examine its two components separately. When we look at Panel B, we can see that for the most overvalued firms (columns 7-9), using income-increasing *Other Exclusions* to meet or beat forecasts exacerbates overvaluation. This suggests that increasing GAAP earnings by excluding *Other* expenses (e.g. goodwill amortization, stock compensation expense) makes a precise valuation of shares more complicated for the most overvalued firms, thus moving them even further from fundamental value. This may be due to differences in interpretation of their impact on future performance and thereby increase mispricing (see Bradshaw et al., 2018b [19]). We see the exact opposite effect for the least overvalued stocks (columns 10-12): For those firms excluding *Other* expenses that increase pro forma versus GAAP earnings and enable the firm to exceed forecasts reduces misvaluation. This indicates that for those firms, such exclusions may help the market to price shares closer to their fundamental value.

¹⁵ *Special Items* are items such as restructuring charges or asset write-downs, while *Other Exclusions* include items such as goodwill amortization, stock compensation expense, or legal settlement costs (see Doyle et al., 2003 [31]; Landsman et al., 2007 [50]).

Table 8. Logistic regression for the effect of *Positive Exclusions* on overvaluation

Panel A: Total Exclusions						
	(1)	(2)	(3)	(4)	(5)	(6)
	Highest MTB	Highest MTB	Highest MTB	Lowest MTB	Lowest MTB	Lowest MTB
EPS_MB*TEPos	-0.394	-0.356	-0.211	0.633**	0.550*	0.561
	(-0.912)	(-0.882)	(-0.420)	(2.015)	(1.666)	(1.333)
Panel B: Other Exclusions						
	(7)	(8)	(9)	(10)	(11)	(12)
	Highest MTB	Highest MTB	Highest MTB	Lowest MTB	Lowest MTB	Lowest MTB
EPS_MB*OEPoS	0.834***	1.121***	1.233***	- 1.030***	- 1.080***	-1.338***
	(2.695)	(2.697)	(3.131)	(-3.194)	(-3.196)	(-2.991)
Panel C: Special Items						
	(13)	(14)	(15)	(16)	(17)	(18)
	Highest MTB	Highest MTB	Highest MTB	Lowest MTB	Lowest MTB	Lowest MTB
EPS_MB*SIPoS	-0.702**	-0.924**	-1.235**	0.925***	1.014***	1.130***
	(-2.200)	(-2.245)	(-2.367)	(3.414)	(3.492)	(3.257)
Observations	747	747	747	747	747	747
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effect	No	quarter	firm and quarter	No	quarter	firm and quarter
StdErr_Cluster	firm	firm	firm	firm	firm	firm
This table shows the logistic regression results for the effect of Positive (income-increasing) Exclusions on overvaluation. Panel A, Panel B, and Panel C show the results for Total Exclusions, Other Exclusions, and Special Items, respectively. The sample period of firm-quarter observations is from Q1/2011 to Q1/2017. MTB is the market-to-book ratio, EPS_MB*TEPos (EPS_MB*OEPoS, EPS_MB*SIPoS) 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 using income-increasing Total Exclusions (Other Exclusions, Special Items), and 0 otherwise. Control variables are included but not reported for brevity. Definitions see Table 1. 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.						

Turning our attention to Panel C (*Special Items*) and the most overvalued firms (columns 13-15) we can see that when *Special Items* are excluded to meet or beat forecasts, there is a significant negative association with overvaluation. This is not surprising since *Special Items* are rather considered ‘expected’ by the market (Doyle et al., 2013) [33]. They constitute non-recurring items that need to be removed to arrive at a more permanent earnings measure. If pro forma earnings beat forecasts with the help of removing non-recurring items, this may be perceived as negative by the market, and bring market valuation closer to fundamental value. As

previously, the opposite effect is found for the least overvalued firms (columns 16-18): Firms excluding *Special Items* to increase earnings and that meet or beat forecasts would find an increase in their overvaluation. It appears that removing positive transitory effects to beat forecasts is perceived as positive for the stocks that are least overvalued. To sum up, I find evidence that different types of income-increasing expenses exclusions have a different effect on mispricing.

Fifth, to address endogeneity concerns regarding misvaluation and pro forma disclosure (i.e. past misvaluation prompting pro forma earnings disclosure to alleviate current misvaluation), I employ a two-stage least squares approach (2SLS) and follow previous studies (e.g. Black and Christensen, 2009 [11]; Brown et al., 2012 [21]; Isidro and Marques, 2013 [43], 2015 [43]; Black et al., 2017a [12]; Black, Christensen, Taylor Joo, and Schmardebeck, 2017b [13]) to identify exogenous instruments for pro forma disclosure that are uncorrelated with misvaluation. The results (not reported) provide no indication of endogeneity, thus the results are unaffected.

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 post-global financial crisis market and investment environment, which facilitate mispricing and are challenging the traditional primacy of accounting disclosures for valuation.

I provide evidence that pro forma earnings disclosures still provide additional information that helps reduce mispricing in this 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. I 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. Moreover, different types of expense exclusions that increase pro forma earnings versus GAAP profit to meet or beat analyst earnings forecasts affect mispricing differently. Overall, the evidence suggests that pro forma earnings disclosures provide value relevant information that can help reduce mispricing of shares.

The findings are 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. Furthermore, the evidence is particularly important in light of developments in the last decade that have led to record high stock market valuations and increased mispricing. My findings provide feedback on the effects of

unconventional monetary policy in the wake of the financial crisis, and can contribute to discussions about the role of information disclosure in an age of abundant central bank provided liquidity and passive investing.

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