Valuation Implications of Unconditional Accounting Conservatism: Evidence from Analysts' Target Prices

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Abstract

We examine whether financial analysts understand the valuation implications of unconditional accounting conservatism when forecasting target prices. While accounting conservatism affects reported earnings, conservatism per se does not have an effect on the present value of future cash flows. We examine whether analysts adjust for the effect of conservatism included in their earnings forecasts when using these forecasts to estimate target prices. We find that signed target price errors (actual minus forecast) have a significant positive association with the degree of conservatism in forward earnings, suggesting that target prices are biased due to accounting conservatism. Cross-sectional analysis suggests that more sophisticated analysts and superior long-term forecasters adjust for conservatism to a greater extent than other analysts. In additional analyses, we explore the mechanism through which conservatism leads to bias in target prices. We first show that analysts' earnings forecasts are negatively associated with the degree of conservatism, i.e., analysts include the effect of unconditional conservatism in their earnings forecasts. Based on alternative earnings-based valuation models that analysts may use, our evidence suggests that analysts fail to appropriately adjust their valuation multiple for the effect of conservatism included in their earnings forecasts when using these forecasts to derive target prices. As a consequence, we find that, for extreme changes in conservatism, the bias in analysts' target prices due to conservatism leads to a distortion of market prices. The evidence highlights the concern that analysts may not appreciate the valuation implications of conservative accounting which could inhibit price discovery.

Keywords: Conservatism, valuation, analyst target price, mispricing

JEL classification: G12, G14, G41, M41

Data availability: All data used are publicly available from sources cited in the text.

1. Introduction

Conservatism is viewed by many as a desirable attribute of accounting. Conservatism enhances the efficiency of contracting with debt-holders and managers, and reduces expected shareholder litigation costs and the present value of tax payments (see Watts and Zimmerman 1986; Watts 2003). While conservative accounting can be useful in some settings, it can introduce complexity when it comes to firm valuation and lead to pricing errors (Penman and Zhang 2002). In this paper, we test whether accounting conservatism leads to a distortion of a relevant information input to the price formation process, namely target prices issued by financial analysts. We then examine whether the conservatism-induced distortion of target prices (if any) leads to a distortion of market prices.

We test whether analysts, who are relatively sophisticated market participants, understand the valuation implications of unconditional accounting conservatism incorporated into their earnings forecasts, when they derive target prices using their earnings forecasts.[1] We focus our analysis on unconditional conservatism because it is more likely to affect analysts' earnings forecasts than conditional (or news-dependent) conservatism. Events that lead to conditional conservatism are often non-recurring in nature and hard to predict and thus less likely to be forecasted by analysts, e.g., asset impairments (Basu 1997; Louis et al. 2014; Heflin et al. 2015). As such, in assessing analyst forecast accuracy, disclosed losses that reflect conditional conservatism are often excluded from the realized earnings number (I/B/E/S actuals) to which the analyst forecast is compared. On the other hand, since unconditional conservatism affects I/B/E/S earnings and can be reasonably predicted, analysts will likely include its effect in their earnings forecasts to earn rewards associated with forecast accuracy.[2]

[1] Unconditional (or news independent) conservatism commonly refers to conservative accounting determined at the inception of assets and liabilities (e.g., LIFO inventory valuation, immediate expensing of research and development costs, accelerated depreciation, etc.). See Beaver and Ryan (2005) for a detailed discussion.

[2] Prior research shows that earnings forecast accuracy is related to analysts' career outcomes, specifically job tenure and turnover (Stickel 1992; Mikhail et al. 1999; Hong et al. 2000; Hong and Kubik 2003). On the other hand, earnings forecast accuracy is shown to have an insignificant effect on analyst compensation. For example, survey responses in Brown et al. (2015) indicate that earnings forecast accuracy ranks low among performance metrics used to compensate sell-side analysts. Groysberg et al. (2011) use proprietary data from a major investment bank and find that earnings forecast accuracy is insignificantly related to analyst compensation, but has a significant relation with analyst turnover.

While accounting conservatism has a downward (upward) effect on earnings when investment is growing (declining), it does not have the same effect on the present value of future cash flows. Do analysts understand this valuation implication of conservatism when they use their earnings forecasts to derive target prices? When expected earnings are lower (higher) due to an expected increase (decrease) in conservatism, analysts must adjust target prices to compensate for their lower (higher) expected earnings (Penman 2013). However, Bradshaw et al. (2013) show that evidence of persistent differential ability of analysts to forecast target prices is economically weak. Thus, if analysts have limited ability and/or incentives to forecast high quality target prices, we hypothesize that they will fail to adjust for the effect of conservatism included in their earnings forecasts, when using these forecasts to derive target prices.

Bradshaw (2002) finds that target prices on average are based on simple valuation heuristics, such as the price-to-earnings (P/E) or the price-earnings-to-growth (PEG) ratios. Thus, it is likely that, when analysts use earnings-based valuation heuristics to derive target prices, they may not make the appropriate adjustment to compensate for the fact that their earnings forecasts are affected by conservatism. Suppose that an analyst values a firm using the P/E multiple. If the analyst's earnings forecast is lower (higher) due to an expected increase (decrease) in conservatism and the analyst does not use a higher (lower) P/E multiple to adjust for the effect of conservatism, it will result in a distortion of the target price. Similarly, if analysts use the PEG ratio to value firms, then to the extent they fail to adjust the PEG multiple to account for the fact that short-term earnings are affected by conservatism, their target prices will be distorted.

Prior research finds a significant market reaction to analysts' target price revisions that is incremental to the reaction to their contemporaneously-issued earnings forecast revisions and stock recommendations (e.g., Brav and Lehavy 2003).[3] In fact, for a sample of *Institutional Investor's* "All-America" research team analysts, Asquith et al. (2005) find that the market reaction to target price revisions is greater than the reaction to earnings forecast revisions of the same magnitude. These results suggest that

[3] On the other hand, prior research finds the investment performance of analysts' target prices to be unimpressive on average, consistent with analysts lacking sufficient incentives or ability to forecast high quality target prices (Asquith et al. 2005; Bradshaw et al. 2013).

investors view target prices as being informative and hence any bias in the derivation of target prices could potentially lead to a distortion of market prices.

We measure the effect of unconditional accounting conservatism on reported earnings by the change in "hidden" reserves generated by conservative accounting. Similar to Penman and Zhang (2002), we estimate hidden reserves as the sum of inventory reserve, research and development (R&D) reserve, and advertising reserve, each of which reflects the estimated unamortized asset that would have appeared on the balance sheet if the expenditure had been capitalized. The change in hidden reserves equals the expenditure incurred during the year minus the hypothetical amortization of the asset. An increase in hidden reserves reflects the creation of reserves which has a downward impact on earnings, while a decrease in hidden reserves reflects the withdrawal from reserves which has an upward impact on earnings. Thus, the change in hidden reserves (termed Δ*Conservatism*, henceforth) captures the effect of unconditional conservatism on the income statement. When earnings forecasts are lower (higher) due to an increase (decrease) in forecasted conservatism and analysts fail to adjust their target prices to compensate for their lower (higher) earnings forecasts, target prices will be biased downward (upward). Thus, we expect signed target-price *errors* (i.e., actual price minus target price) to be positively related to Δ*Conservatism*.

Consistent with this prediction, we find a significant positive association between target-price errors and forecasted Δ*Conservatism* after controlling for the same analyst's contemporaneous earnings forecast error and other determinants of target price error. In examining differences among analysts, we find that target prices of relatively sophisticated analysts (based on brokerage size and experience) are less biased due to earnings conservatism, although significant bias is still present. In addition, we find that the conservatism-induced bias in target prices is lower for analysts whose long-term growth forecasts reflect that an increase (decrease) in conservatism will lead to higher (lower) earnings in subsequent periods. However, even for these high-quality long-term forecasters, significant bias in target prices is still present. Overall, these results suggest that analysts do not appropriately adjust for the effect of conservatism included in their earnings forecasts when using these forecasts to derive target prices.

We next explore the mechanism through which unconditional conservatism leads to bias in target

prices. First, we verify whether the *market price*, which we use for calculating the target price error, adjusts for the effect of Δ*Conservatism* on future earnings. Consistent with Easton and Pae (2004), we find that on average market prices do adjust for the effect of conservatism. Second, we examine how Δ*Conservatism* affects two components of the analyst's target price (i) earnings forecasts—the input to analysts' target price estimation, and (ii) the valuation multiple used by analysts to convert their earnings forecasts into target prices (assuming analysts use earnings-based heuristics, such as the forward P/E or PEG multiple).

We find that, on average, analysts include the effect of unconditional conservatism in their earnings forecasts, i.e., earnings forecasts are negatively associated with the contemporaneous Δ*Conservatism*. We next test whether the valuation multiple used by analysts to derive target prices appropriately adjusts for the effect of Δ*Conservatism* included in their earnings forecasts; we compare the analysts' adjustment of their valuation multiple with the market's adjustment, using the market's P/E multiple as a benchmark. We find that, while the market's forward P/E multiple is significantly higher (lower) when conservatism increases (decreases), analysts' target-price-to-forward-earnings multiple is not significantly associated with Δ*Conservatism*. Consistent with our prediction, analysts' adjustment of the valuation multiple for Δ*Conservatism* is significantly lower than the market's adjustment. Similarly, our evidence suggests that analysts do not adjust the PEG multiple for the effect of conservatism included in their earnings growth forecasts when deriving target prices. Overall, we find that analysts understand that conservatism affects earnings and accordingly include its effect in their earnings forecasts, but do not appear to understand the valuation implications of conservatism when forecasting target prices.[4]

As discussed earlier, in contrast to analysts' target prices, we find that on average market prices adjust for the effect of conservatism (consistent with Easton and Pae 2004). This on-average finding, however, does not rule out the possibility of price distortion for some cases, given our finding that

[4] To elaborate, it is not that analysts use flawed inputs (earnings forecasts) to derive flawed outputs (target prices), i.e., it is not a "garbage in, garbage out" situation. On the contrary, they use earnings forecasts which appropriately include the effect of conservatism, but their failure to fully adjust for this effect leads to flawed outputs (target prices), i.e., "good-stuff in, garbage out." Appendix 1 illustrates this phenomenon with a numerical example and shows that in fact higher accuracy of earnings forecasts with respect to an increase in conservatism can lead to *greater* downward bias in target prices, if the P/E multiple is not adjusted.

accounting conservatism leads to bias in analysts' target prices. This is especially a concern because prior research finds that target prices have a significant price impact. Our analysis shows that firms with a relatively low target price and high Δ*Conservatism* earn significantly positive future excess returns and firms with a relatively high target price and negative Δ*Conservatism* earn significantly negative future excess returns. The effect on future returns is especially strong for firms with high Δ*Conservatism*; for these firms, we find that the differential excess return in the subsequent year for the low minus the high target price groups is 15.7 percent after controlling for variables that are known to explain the cross-section of stock returns, including accounting variables such as accruals and net operating assets. This systematic return performance suggests that the market undervalues (overvalues) firms, when analysts' target prices are significantly underestimated (overestimated) due to extreme changes in conservatism.

Our paper contributes to the literature on analysts' forecasts and security valuation by examining how forecasts of earnings (valuation inputs) and target prices (valuation outputs) are affected by unconditional conservatism. We find strong evidence that analysts incorporate conservatism into their earnings forecasts and fail to find evidence that analysts appropriately adjust for the effect of conservatism when using their earnings forecasts to derive target prices. Incorporating conservatism into earnings forecasts and failing to adjust for its effect in target prices leads to biased target prices.

Our paper also contributes to the literature on market efficiency with respect to unconditional conservatism. Penman and Zhang (2002) show that investors face difficulty in understanding that reported earnings may not be sustainable when they are conservatively determined. We study one of the mechanisms through which pricing errors due to accounting conservatism may occur. We focus on the actions of important intermediaries in the price discovery process—financial analysts—and find that bias due to accounting conservatism arises during the valuation task, i.e., target price estimation. For firms with extreme changes in conservatism, the bias in target prices is transmitted to investors and leads to pricing errors.

Our findings have practical implications for analysts in relation to their target prices. As discussed above, both prior and our results indicate that, while analysts are relatively accurate in forecasting earnings,

their target prices are of low quality. Ironically, it appears that a source of their low-quality target prices is their high-quality forecasting of conservative earnings. Our evidence therefore suggests that emphasizing the quality of one valuation input (i.e., earnings forecasts) in analysts' reward functions rather than the quality of their end-products (target prices) may be counter-productive. Our evidence highlights that failing to consider the sustainability of earnings used as inputs to analysts' valuation models can lead to biased target prices when accounting is conservative.

The rest of the paper is organized as follows. Section 2 discusses prior research and hypotheses development. Section 3 describes the data, sample selection, and research design. Empirical results are reported in section 4, followed by concluding remarks in section 5.

2. Prior Research and Hypotheses Development

Most sell-side analysts produce three important outputs—earnings forecasts, target prices, and stock recommendations. These outputs have been shown by research to have a significant impact on stock prices. We focus on target prices to examine how analysts deal with the effect of conservative accounting on reported earnings when valuing stocks.[5]

Prior research demonstrates that analysts' target prices are informative to market participants. Brav and Lehavy (2003) find a significant market reaction to target price revisions, incremental to that of stock recommendations and earnings forecast revisions that are issued contemporaneously.[6] Although target prices convey information to the market, the evidence in Bradshaw et al. (2013) shows that only 38 percent of analysts' 12-month price targets are attained at the end of the 12-month forecast horizon. Asquith et al. (2005) find that 54 percent of target prices issued by All-America team analysts are attained over the one-

[5] While it would be interesting to examine if analysts' stock recommendations reflect the effect of conservatism in their earnings forecasts, the discrete nature of stock recommendations (i.e., Buy, Hold, Sell, etc.) may inhibit our ability to detect the effect. We believe that the granularity of target prices, which analysts issue in support of their stock recommendations, is likely to provide a more powerful test setting.

[6] Conceptually, target prices should be more useful to investors relative to stock recommendations, because recommendations reflect the analyst's assessment of investors' risk tolerance and investment objectives which are not uniform across all investors.

year forecast horizon, with prices overshooting the target by 37 percent on average; the remaining 46 percent of stocks fall short of the price target by about 16 percent. Overall, the empirical evidence suggests that analysts' target prices convey value-relevant information to the market, although their average investment performance is modest.

Since earnings forecasts are a critical input for estimating price targets in commonly used valuation approaches, accurate earnings forecasts should lead to high quality target prices. Contrary to this expectation, Bradshaw and Brown (2006) show that superior earnings forecasting ability does not translate to superior forecasts of target prices. We posit that one reason target prices could be of low quality even in the presence of accurate earnings forecasts is analysts' treatment of conservatism.

Conservative accounting (e.g., expensing R&D) creates "hidden" reserves on the balance sheet. Hidden reserves can increase or decrease depending on whether investment (e.g., R&D spending) is growing or declining and thus can have a downward or upward impact on reported earnings (Penman and Zhang 2002). We use the term, change in conservatism (Δ*Conservatism*), to denote the change in hidden reserves that captures the impact of unconditional conservatism on the income statement. If analysts' earnings forecasts are affected by Δ*Conservatism*, then analysts must adjust for this effect when using these forecasts to derive target prices, because accounting conservatism per se does not have an effect on the present value of future cash flows. If analysts fail to adjust for the effect of Δ*Conservatism* when deriving target prices, target prices will be biased.

We hypothesize that, since analysts are known to convert their earnings forecasts into target prices based on simplified valuation models/heuristics (Bradshaw 2002, 2004; Gleason et al. 2013), they will fail to adjust their target prices for the effect of Δ*Conservatism* included in their earnings forecasts. We argue that this is likely to happen for at least two reasons. First, due to limited sophistication, analysts may not appreciate that a change in unconditional conservatism affects the sustainability of future earnings (Penman and Zhang 2002). Second, even sophisticated analysts may not have strong incentives to devote time and effort in issuing high quality target prices. Bradshaw et al. (2013) find economically weak evidence of persistent differences among analysts in their ability to forecast target prices, likely because target price

quality does not appear to be explicitly tied to their career concerns.[7] Thus, either due to limited sophistication or lack of incentives (or both), analysts may fail to adjust for the effect of ΔConservatism when converting their earnings forecasts into target prices, leading to a bias in target prices.

When earnings forecasts are lower (higher) due to an increase (decrease) in forecasted conservatism, but analysts do not adjust for conservatism when using their lower (higher) earnings forecasts as inputs to their valuation model, target prices will be lower (higher) compared to the actual future price. Hence, we expect a positive association between signed target price *errors* (i.e., actual future price minus target price) and the forecasted Δ*Conservatism*. Thus, our first hypothesis is as follows:

HYPOTHESIS 1. *On average, analysts' target price errors are positively associated with the forecasted change in unconditional conservatism.*

We follow up our tests of Hypothesis 1 by exploring the mechanism through which target prices get biased due to the effect of a change in unconditional conservatism. Specifically, we focus on the components of the target price: (i) earnings forecasts—the input to analysts' target price estimation, and (ii) the valuation multiple used by analysts to convert their earnings forecasts into target prices.[8] We first examine whether earnings forecasts, which are typically used by analysts as inputs to derive target prices (Asquith et al. 2005), incorporate changes in unconditional conservatism. Prior research shows that analysts have incentives to minimize their earnings forecast errors because their job tenure is linked to the quality of their earnings forecasts (see Stickel 1992; Mikhail et al. 1999; Hong et al. 2000; Hong and Kubik 2003; Groysberg et al. 2011). Since earnings forecasts are compared to reported (or I/B/E/S) earnings which are affected by changes in unconditional conservatism, we expect that analysts will incorporate changes in

[7] Analysts may have incentives to produce high quality target prices if these result in profitable stock recommendations. However, Mikhail et al. (1999) find no evidence of a relation between profitability of recommendations and analyst turnover. As regards analyst compensation, the proprietary data in Groysberg et al. (2011) shows that *WSJ* star stock pickers earn higher compensation. On the other hand, survey evidence in Brown et al. (2015) shows that profitability of recommendations ranks low among performance metrics used to compensate analysts.

[8] Assuming that analysts value stocks using the P/E multiple, we examine the effect of conservatism on two components of target price—earnings forecast and the P/E multiple. This is analogous in spirit to the Dupont decomposition of return on equity and is intended to further our understanding of how target price components are affected by conservatism.

unconditional conservatism into their earnings forecasts to achieve high accuracy. To our knowledge, there are no prior studies that examine the extent to which analysts incorporate changes in *unconditional* conservatism into their earnings forecasts.[9] Since an increase (decrease) in conservatism results in lower (higher) earnings, we expect a negative relation between analysts' earnings forecasts and the contemporaneous Δ*Conservatism*. Thus, our second hypothesis is as follows:

HYPOTHESIS 2. *On average, analysts' earnings forecasts incorporate the change in unconditional conservatism, i.e., there is a negative association between earnings forecasts and the contemporaneous change in conservatism.*

We next focus on the second component of the target price—the *multiple* that maps analysts' earnings forecasts into their target prices.[10] Relying on prior results (Asquith et al. 2005), we assume that analysts use the forward P/E (or PEG) multiple to estimate target prices. We examine whether analysts adjust the valuation multiple for the effect of Δ*Conservatism* included in their earnings forecasts, when converting these forecasts into target prices. Our test approach follows the suggestion in financial statement analysis textbooks to adjust earnings or earnings multiples for the effect of conservatism when valuing stocks, e.g., Penman (2013), Palepu and Healy (2013), Wahlen et al. (2017).[11] We examine whether the adjustment for Δ*Conservatism* made by analysts to the multiple implied by their target price is significantly lower than the market's adjustment to the forward P/E multiple. We assess the extent of the adjustment made by analysts by using the market's multiple as a benchmark, because prior research shows that on average the market incorporates the effect of conservative accounting into stock prices (Easton and Pae 2004). Specifically, when an increase (decrease) in forecasted conservatism results in lower (higher)

[9] Louis et al. (2014) find a significant negative relation between *conditional* conservatism and analysts' (signed) earnings forecast errors, suggesting that analysts do not fully incorporate the effect of conditional conservatism into their earnings forecasts. Their result is consistent with Heflin et al. (2015) who argue that events that lead to conditional conservatism are often non-recurring in nature and hard to predict and hence less likely to be forecasted by analysts.

[10] Prior studies also examine the mapping of analysts' earnings forecasts into their stock recommendations and find that analysts' mapping is influenced by their investment banking relationship (Ertimur et al. 2007; Chen and Chen 2009) as well as insider trading, institutional ownership, and investor sentiment (Ke and Yu 2009).

[11] For example, Penman (2013, 118) writes that, when forward earnings are depressed by an increase in conservatism, one must use a higher forward P/E multiple.

forward earnings, if the market compensates for the lower (higher) forward earnings by using a higher (lower) earnings multiple but analysts do not do the same, we expect Δ*Conservatism* to have a lower association with the multiple implied by the target price than with the market's forward P/E multiple. Thus, our third hypothesis is as follows:

HYPOTHESIS 3. *On average, the change in unconditional conservatism has a significantly lower association with the target-price-to-earnings multiple relative to the market-price-to-earnings multiple.*

3. Data, Sample Selection and Variable Definitions

3.1 Data and sample selection

We obtain analysts' earnings forecasts and target prices from the I/B/E/S database and other financial data from CRSP and Compustat for all non-financial U.S. firms over the years 1999 through 2015.[12] We use target price data up to 2013 because our tests require realized earnings and change in conservatism of the subsequent two years following the target price issuance date. Similar to prior studies, for each target price, we identify one-year- and two-year-ahead EPS forecasts that are issued by the same analyst within a period of 30 days ending with the target price release date.[13] This ensures that we use the specific EPS forecasts that are likely to be used by analysts as inputs to their valuation model. This initial sample includes 626,501 12-month target prices issued by 10,545 analysts affiliated with 718 distinct brokerage and stock research companies. We limit our sample to 12-month-ahead target prices issued by analysts within a period of three months following the previous year's earnings announcement. Retaining only target prices issued within a three-month period of a given year reduces our sample to 156,699 12-month target prices (roughly one-fourth of the original sample size) issued by 7,660 individual analysts.

We impose several additional requirements to obtain the final sample. Following Bradshaw et al. (2013), we require the closing share price three days prior to the target price issuance date to exceed $1 to

[12] I/B/E/S provides analysts' target prices in addition to earnings forecasts from the year 1999 onward.
[13] We retain the most recent forecast when multiple EPS forecasts are issued during the 30-day period.

mitigate the influence of thinly traded stocks. Consistent with prior research (e.g., Liu et al. 2002), we delete observations with negative EPS and negative EPS forecasts because of the difficulty in basing valuations on negative earnings. Further, we require the actual stock price at the end of the twelfth month following the target price issuance date and the actual EPS of the following year for the purpose of calculating forecast errors.[14] We obtain stock price and returns data from CRSP, actual EPS and dividends per share from I/B/E/S, and variables used to measure conservatism and control variables from Compustat. In case of multiple target prices issued by the same analyst for a particular firm-year, we only retain the first target price issued within the three-month window after the previous year's earnings announcement. After imposing these data restrictions, we obtain a final sample of 95,058 analyst-firm-year target prices and associated earnings forecasts. These forecasts are issued by 7,121 individual analysts affiliated with 558 distinct brokerage companies and cover 3,881 distinct firms. Our sample has an average of 4.28 target prices from different analysts for a firm-year.

3.2 Measure of change in conservatism

We estimate the effect of a change in unconditional conservatism on the income statement by taking the difference between the beginning and ending balances of hidden reserves. Our measure of hidden reserves captures unrecorded assets (e.g., R&D) or assets that are undervalued due to conservative accounting (e.g., LIFO inventory). Similar to Penman and Zhang (2002), we calculate hidden reserves as the sum of R&D reserve, advertising reserve, and inventory reserve. We acknowledge that our measure disregards hidden reserves related to other assets and liabilities. However, we find that the change in the sum-total of these three reserves has an economically significant impact (9 percent) on reported earnings.

Inventory reserve (*Inventory Reserve*) equals the LIFO reserve reported in the inventory footnote in the company's annual report. R&D reserve is calculated using standard procedures and equals the unamortized balance of the R&D asset that would have appeared on the balance sheet if R&D expenditure

[14] Our requirement of the actual price for periods after the target price date may lead to survivorship bias; however, the sample size reduction due to this requirement is nominal at 0.14 percent.

had been capitalized and not expensed as incurred. We follow Amir et al. (2003) for the specific calculation of the R&D reserve. We (hypothetically) capitalize R&D expense during the year and amortize the asset at a uniform straight-line amortization rate of 20 percent, assuming that R&D expense is incurred evenly during the year. Thus, R&D reserve equals:

$$R\&D\ Reserve_t = 0.9\times R\&D_t + 0.7\times R\&D_{t-1} + 0.5\times R\&D_{t-2} + 0.3\times R\&D_{t-3} + 0.1\times R\&D_{t-4}, \quad (1)$$

where $R\&D_t$ is the R&D expense for year t.[15] Advertising reserve is the estimated asset that would be reported on the balance sheet if advertising expenditure (assumed to be incurred at the end of the year) was capitalized and amortized using the sum-of-the-years' digits amortization schedule with a two-year useful life. Thus, advertising reserve equals:

$$Advertising\ Reserve_t = ADV_t + 1/3\times ADV_{t-1}, \quad (2)$$

where ADV_t is the advertising expense for year t. We use this amortization schedule because typically advertising has a useful life of one to two years and provides more benefits when it is initiated (Penman and Zhang 2002).[16] Our measure of the effect of a change in conservatism on earnings equals the sum of changes in the three hidden reserves relative to the previous year:

$$\Delta Conservatism = \Delta(Inventory\ Reserve + R\&D\ Reserve + Advertising\ Reserve). \quad (3)$$

We use the term $\Delta Conservatism$ to describe the change in hidden reserves. Our measure captures the impact of conservatism, as it relates to the accounting for inventory, R&D and advertising, on the income statement for the year. $\Delta Conservatism$ will be zero when investment growth is in steady state and non-zero when investment growth changes from year to year.

4. Empirical Analysis

4.1 Descriptive statistics

Table 1, panel A, presents descriptive statistics for our sample firms over the period 1999-2013.

[15] As explained by Amir et al. (2003), this amortization schedule approximates the industry average amortization schedule estimated in Lev and Sougiannis (1996).

[16] When the data item for *R&D* or *ADV* is missing in Compustat, we equate the variable to zero. The results are substantially similar when we delete observations with missing data.

Variables are defined in Appendix 2. All variables (except the long-term growth rate forecast) are scaled by the closing price three trading days prior to the target price release date. All continuous variables are winsorized at the top and bottom 1 percent of their distributions to mitigate the undue impact of outliers. Consistent with prior research, analyst optimism is evident in their one-year-ahead EPS forecast as indicated by the negative mean EPS forecast error (actual minus forecast) of -0.0043. On average, the 12-month target price exceeds the stock price just prior to the forecast release date by 20 percent (*TP/P* = 1.20).[17] As evident from the negative mean target price forecast error (*TPFE*) of -0.066, target prices are optimistic on average over our sample period (consistent with Bradshaw et al. 2013). Target prices exceed the realized price for 57 percent of sample firms and are lower than the realized price for 43 percent of sample firms (untabulated). The mean long-term growth rate forecast is 18.4 percent for our sample with available forecast data. While the mean reported EPS (calculated at the firm level) is 4.9 percent of price, the mean EPS before the effect of conservatism is higher at 5.3 percent and the mean effect of conservatism on EPS, Δ*Conservatism*, is 0.47 percent. Thus, the reported EPS of our sample is lower by about 9 percent (0.47/5.3) on average due to the effect of accounting conservatism. We find that Δ*Conservatism* >0 ($\leq$0) for 55 percent (45 percent) of our sample firms (untabulated). The income effect of change in conservatism mostly captures the effect of Δ *R&D Reserve* (77 percent), with Δ *Advertising Reserve* and Δ *Inventory Reserve* making up 19 percent and 4 percent of the total effect, respectively.

[Insert Table 1 here]

In panel B, we provide descriptive statistics of key variables by three sub-periods—1999-2003, 2004-2008 and 2009-2013. The mean ratio of 12-month target price to stock price just prior to forecast release (*TP/P*) declines over time, from a high of 1.29 over 1999-2003 to 1.18 over 2009-2013. While panel A shows that target prices are optimistic on average over the full sample period, the *positive* mean target price error (*TPFE*) in the 2009-2013 sub-period indicates that target prices are on average *pessimistic* in the post-crisis period, with the mean target price being *lower* than the mean 12-month-ahead realized price by

[17] The mean *TP/P* of 1.2 over our sample period 1999-2013 is comparable with the mean of 1.24 reported by Bradshaw et al. (2013) over 2000-2009.

5.1 percent. The average income effect of conservatism, Δ*Conservatism*, is lower in the last sub-period (2009-2013) mainly due to the post-crisis decline in R&D and advertising growth, although note that the cross-sectional variation remains at the same level as the previous sub-period (as indicated by the standard deviation). Based on a comparison of the number of firm-year observations and analyst-firm-year observations, the average number of I/B/E/S analysts covering a firm (and issuing target prices) increases from 2.7 during 1999-2003 (14,528/5,353) to 5.7 analysts during 2009-2013 (47,526/ 8,304).[18]

Panel C presents the descriptive statistics of key variables by industry by assigning firms to five broad Fama-French industry portfolios.[19] The sample exhibits a concentration of firms in high-tech (29.1 percent), manufacturing (23.2 percent) and consumer (22.2 percent) industries. While the ratio of target price to pre-forecast issuance price (*TP/P*) shows only slight variation across industry groups, target price error (*TPFE*) indicates that analysts are more optimistic for high-tech firms. There is only slight variation in reported EPS across different industry groups. Δ*Conservatism* is substantially higher for high-tech and health industry groups relative to others, consistent with greater R&D growth in these industries.[20]

4.2 Δ*Conservatism and target price errors*

Table 2, panel A, presents results of the association between target price error (actual price minus forecast) at date *t* and the effect of conservatism on the earnings of year *t+1*. Hypothesis 1 suggests that, when the earnings forecast is lower (higher) due to an increase (decrease) in forecasted conservatism, but analysts do not adjust for conservatism when converting their lower (higher) earnings forecasts into their target price, the target price will be lower (higher) compared to the actual future price. On the other hand, if analysts appropriately adjust for conservatism in their earnings forecasts when deriving their target prices, we should not find any relation between target price errors and Δ*Conservatism*. Using analyst-firm-year

[18] The number of firm-year observations declines from 8,579 to 8,304 from 2004-2008 to 2009-2013 due to the exit of a significant number of sample firms in 2009 with a less than full recovery in later years. We also lose some sample firms in the last year of the sub-period (i.e., 2013) due to non-availability of two-year-ahead data.
[19] The industry portfolio classification, described in the notes to Table 1, is obtained from Kenneth French's website for which we are grateful.
[20] Deleting high-tech and health industry groups from our sample does not substantially change our results.

observations, we estimate a cross-sectional time-series regression of signed target price errors on the change in conservatism and several control variables. Note that the forecast of the 12-month target price of date *t*, TP_t, is made at date *t-1*. We assume that the analyst will estimate TP_t based on forward earnings and thus we use the effect of conservatism on year *t+1* earnings as the explanatory variable.

$$TPFE_{ijt} = \theta_0 + \theta_1 \Delta Conservatism_{it+1} + \Sigma \theta_k Control_k + \varepsilon. \quad (4)$$

Similar to Bradshaw et al. (2013), we measure target price error, $TPFE_{ijt}$ as the actual price of firm *i* on date *t* minus the date-*t* target price of firm *i* issued by analyst *j*, TP_{ijt}, scaled by price three trading days prior to the target price release date *t-1*. $\Delta Conservatism_{it+1}$ equals the effect of conservatism on year *t+1* earnings of firm *i*, scaled by the closing price three trading days prior to the target price release date *t-1*. The timeline in Figure 1 shows the timing of measurement of the variables of interest. If analysts do not adjust for the effect of conservatism included in their earnings forecasts, target prices will be downward (upward) biased when $\Delta Conservatism$ is positive (negative).[21] We use signed (as opposed to absolute) target price errors (*TPFE*) as the dependent variable because we hypothesize that a change in conservatism leads to a directional bias in forecasts, i.e., we expect a positive association between signed target price errors and $\Delta Conservatism$ (i.e., $\theta_1 > 0$). Note that target prices exhibit optimistic bias on average as shown in Table 1, panel A. The overall target price optimism is expected to be captured by the intercept (θ_0). $\Delta Conservatism$ is measured using Penman and Zhang (2002) as explained in section 3.2.[22]

[Insert Figure 1 here]

We use two measures of the effect of conservatism on earnings—realized $\Delta Conservatism$ and forecasted $\Delta Conservatism$. Realized $\Delta Conservatism$ is an ex-post measure of forecasted change in conservatism. Since our hypothesis suggests that target prices are biased due to conservatism because

[21] Negative $\Delta Conservatism$ due to a decline in investment (say by cutting R&D) could be motivated by real earnings management (REM). Since the REM-motivated investment decline will decrease hidden reserves and future benefits, the adjustment for $\Delta Conservatism$ is still necessary to obtain an unbiased target price.

[22] While our conservatism measure captures the change in hidden reserves and is consistent with Penman and Zhang (2002), it is highly correlated (ρ=0.77) with the sum of the change in R&D expense, the change in Advertising expense, and the change in LIFO reserve (since the hypothetical amortization of expenditures has a smaller effect on the measure). As such, when we simply use (Δ *Inventory Reserve* + $\Delta R\&D$ + ΔADV) instead of $\Delta Conservatism$ in our analyses, we obtain substantially similar results.

analysts do not adjust for the conservatism reflected in their earnings forecasts, we ideally should use analysts' forecasted change in conservatism. However, the amount of conservatism included in analysts' earnings forecasts is unobservable. To address the concern that realized Δ*Conservatism* may not be perfectly forecasted by analysts, we estimate forecasted Δ*Conservatism* based on a prediction model estimated from historical time-series data. Specifically, for each firm, we estimate a second-order autoregressive model of Δ*Conservatism* (scaled by end-of-the-year total assets) over a period of 20 years ending in the year prior to the forecast date (with a requirement of minimum 10 observations). Our rationale for using this model is our finding that on average Δ*Conservatism* follows a mean-reverting process and the mean reversion is almost complete by the end of two years (autocorrelation coefficients: ρ_1=0.53, ρ_2=0.26, ρ_3=0.09).

We include several control variables that prior research has found to be correlated with analyst forecast errors, namely analysts' long-term earnings growth rate, firm size (log of market value), and book-to-market ratio (B/M), all measured at the beginning of the target price issuance year, as well as prior year's returns and return volatility.[23] We include three additional explanatory variables which are likely to impact forecast errors. First, we include investment banking reputation ranking, *IB-Rank*, as a proxy for analysts' potential conflict of interest. Following Ertimur et al. (2007) and Gleason et al. (2013), we use the Carter-Manaster investment banking reputation ranking (as updated by Loughran and Ritter 2004) to capture analysts' conflict of interest—analysts employed by brokerage firms with significant investment banking business are regarded as potentially conflicted and hence likely to issue optimistic forecasts.[24] Second, we include analysts' contemporaneous one-year-ahead EPS forecast error as an independent variable. Since the EPS forecast is most likely used as an input in the analyst's target price estimation, errors in the EPS forecast could translate to errors in target prices. Third, we include intangible intensity as a control variable to alleviate the concern that our conservatism measure could reflect the firm's intangible intensity which

[23] When analysts' long-term growth rate is not explicitly provided, we use the growth rate implied by analysts' two-year-ahead EPS forecast relative to their one-year-ahead EPS forecast.
[24] Consistent with prior studies, the *IB-Rank* variable is assigned a value of one if the brokerage firm's Carter-Manaster reputation ranking is nine, 0.5 if the ranking is between zero and eight, and zero if the ranking is missing.

may lead to bias due to a correlated omitted variable. Intangible intensity is measured as the sum of R&D expense and advertising expense of the previous three years divided by total assets at the beginning of the target price issuance year.[25] We estimate the regression after including industry (Fama-French 48 industries) and year fixed effects and cluster standard errors by firm.

Table 2, panel A, column (1), shows that, consistent with Hypothesis 1, target price errors are positively related to realized $\Delta Conservatism_{it+1}$ (coefficient estimate 2.430, p-value<0.001).[26]Among control variables, analysts' long-term growth forecast has a significant negative association and B/M has a significant positive association with target price errors, suggesting that analysts issue more optimistic price targets for growth firms.[27] The significant negative association with past returns suggests that analysts tend to issue more optimistic price targets when past performance has been strong (consistent with Clarkson et al. 2012). The negative association of target-price errors with firm size and return volatility is consistent with the argument in Das et al. (1998) that analysts issue more optimistic forecasts for less predictable firms in order to facilitate the attainment of private information from managers. Inconsistent with our expectation, *IB-Rank* is positively associated with target price errors, reflecting that analysts from highly-reputed investment banks are in fact less optimistic during our sample period relative to other analysts in forecasting their price targets. Contemporaneous EPS forecast error is positively related to target price error as expected. Results in column (2) based on forecasted $\Delta Conservatism$ are similar to those reported in column (1) based on realized $\Delta Conservatism$. Overall, consistent with Hypothesis 1, there is a significant positive relation between target price errors and $\Delta Conservatism$ after controlling for other factors that affect forecast errors, suggesting that analysts' target prices are biased due to the effect of conservatism.

[25] Note that $\Delta Conservatism$ reflects the weighted sum of *changes* in R&D and advertising reserves (where the weights depend on the amortization period). Intangible intensity captures the average *level* of R&D and advertising expenditures. When R&D/advertising expenditure is constant across years, $\Delta Conservatism$ will be zero, but the average level of R&D/advertising expenditure can still be high. To verify that the intangible intensity variable does not take away the explanatory power of $\Delta Conservatism$, we exclude it from the regression and find that our results remain substantially unchanged.

[26] When we estimate regression (4) without year and industry fixed effects, we get a negative intercept (θ_0 = -0.058, p-value=0.039), consistent with an overall optimistic bias in analysts' target prices (untabulated).

[27] Frankel and Lee (1998) also find similar optimism in analysts' earnings forecasts for growth firms.

[Insert Table 2 here]

4.2.1 Sensitivity tests

We conduct several sensitivity tests to confirm the robustness of our results (untabulated). First, we estimate regression (4) for three sub-periods—1999-2003, 2004-2008 and 2009-2013. We find that the relation between target price errors and Δ*Conservatism* is positive and significant (at the 1 percent level) in all three sub-periods (with similar coefficient magnitudes). Thus, our results are not period-specific. Second, from Table 2, panel A, long-term growth is negatively related to target price errors, which may imply that analysts with high (low) long-term growth forecasts are more optimistic (pessimistic) in setting target prices. We use analysts' long-term growth as a proxy for analysts' general optimism/pessimism and test whether this analyst-bias impacts how they adjust for conservatism in deriving target prices. We estimate regression (4) separately for sub-samples with above and below median analysts' long-term growth. We find that the association between target price errors and Δ*Conservatism* is positive and significant (at the 1 percent level) for both above- and below-median subsamples. Thus, the adjustment of conservatism by analysts in deriving target prices is insensitive to their general optimism/pessimism. On the other hand, we find that the intercept (after suppressing fixed effects) is significantly negative for the above-median group (-0.037) and significantly positive for the below-median group (0.025), reflecting their overall optimism and pessimism, respectively, in deriving target prices. Third, we estimate regression (4) after replacing realized Δ*Conservatism* with its three components—Δ *R&D Reserve*, Δ *Advertising Reserve* and Δ *Inventory Reserve*. We find that all three components of Δ*Conservatism* are positively associated with target price errors and the associations are significant at the 1 percent level. Thus, although Δ *R&D Reserve* is the largest component of total Δ*Conservatism*, the other two components also contribute to the positive association between target price errors and Δ*Conservatism*.

*4.3 Cross-sectional variation in the relation between Δ*Conservatism* and target price errors*

In this section, we conduct cross-sectional tests to examine settings where we expect the effect of conservatism on target price errors to be less pronounced.

4.3.1 Analyst sophistication and adjustment for ΔConservatism

While panel A of Table 2 presents results for the average analyst, in this subsection, we examine whether more sophisticated analysts are better at adjusting for Δ*Conservatism* when deriving their target prices. We use two measures of analyst sophistication commonly used in the literature based on: (i) brokerage firm size measured by the number of analysts belonging to a brokerage firm in each year, and (ii) analyst experience measured by the number of years an analyst covers a given firm. Following Shroff et al. (2014), we classify analysts as sophisticated if they are affiliated with large brokerage houses (≥ 25 analysts) or have firm-specific experience of five years or more. We estimate regression (4) of target price errors on Δ*Conservatism* and other control variables (as in Table 2, panel A), including the interaction of Δ*Conservatism* and an indicator variable (*High Group*) that takes a value of one if the analyst is classified as sophisticated, and zero otherwise.

From Table 2, panel B, column 1, based on realized Δ*Conservatism*, we find that the bias in target price estimates of analysts affiliated with large brokerage firms is significantly lower relative to that of other analysts, indicated by the negative coefficient estimate on the interaction term (-0.508, p-value=0.063). However, target prices of these analysts also exhibit significant bias due to conservatism, based on the F-test of the sum of the coefficients on Δ*Conservatism* and the interaction term reported in the last row of the table (p-value<0.001). Similarly, results based on analyst experience as a proxy for analyst sophistication (column 3), show that the bias in target prices is significantly lower for more experienced analysts relative to other analysts as indicated by the significant negative coefficient estimate on the interaction term (-0.935, p-value<0.001). However, target prices of analysts with high experience also exhibit significant bias (F-statistic in the last row is significant at the 1 percent level). Results based on forecasted Δ*Conservatism* (columns 2 and 4) are similar to those reported for realized Δ*Conservatism*.[28] Overall, it appears that more sophisticated analysts make a greater adjustment for the effect of conservatism

[28] Untabulated results based on analysts' general experience are similar to those based on analysts' firm-specific experience that we report in the table. We define general experience as the number of years an analyst appears on the I/B/E/S database from 1985 onward; analysts with general experience of 10 years or more are considered sophisticated.

relative to other analysts when arriving at their target prices; however, their target prices also exhibit significant bias (albeit lower).

4.3.2 Future earnings forecasting ability and adjustment for Δ*Conservatism*

From the previous result, a natural question arises as to why analysts on average do not adjust for conservatism included in their earnings forecasts when deriving their target prices. It is likely that less sophisticated analysts may not consider the implications of a change in conservatism for future earnings reflected in their long-term growth forecasts. On the other hand, sophisticated analysts may offset the downward (upward) effect of an increase (decrease) in conservatism on their short-term earnings forecasts by forecasting higher (lower) long-term earnings growth.[29] We reason that analysts who forecast high long-term growth when the change in conservatism is high and low long-term growth when the change in conservatism is low have high quality forecasts of future long-term earnings and are more likely to adjust their target prices. We measure high (low) Δ*Conservatism* and high (low) long-term growth as the top (bottom) quintile of the respective yearly distributions. We create an indicator variable for high-quality forecasters which takes a value of one (i) if an analyst projects high long-term growth when Δ*Conservatism* is high, or (ii) if an analyst projects low long-term growth when Δ*Conservatism* is low. We augment regression (4) with the interaction between Δ*Conservatism* and the indicator variable for high-quality forecasters (*High group*). We expect the coefficient on the interaction term to be negative, if high-quality long-term forecasters are better able to appreciate the implications of Δ*Conservatism* for future earnings in determining their target prices.

Table 2, panel B, column (5), shows a significant negative coefficient on the interaction between realized Δ*Conservatism* and high-quality forecasters (-0.909, p-value=0.016), indicating that target prices of analysts who understand the implications of changes in conservatism for long-term growth are less biased due to Δ*Conservatism*. Although the bias is lower than that of other analysts, high-quality forecasters still exhibit significant conservatism-induced bias in their target prices (as indicated by the F-test in the last row

[29] Consistent with analysts forecasting higher long-term earnings when Δ*Conservatism* is high, we find that the rank correlation between long-term growth and Δ*Conservatism* is significantly positive at 0.08.

of the table). The results using forecasted $\Delta Conservatism$ (column 6) also show that target prices of high-quality forecasters exhibit significantly lower bias due to conservatism relative to other analysts. Overall, the results in panel B of Table 2 enhance confidence in our main results by showing that the observed conservatism-induced bias in analyst target prices is significantly lower when analysts have the expertise to appreciate the implications of conservatism for future earnings.

4.4 Effect of Δ*Conservatism on stock prices*

Having established that target prices are biased due to the change in unconditional conservatism, we next explore the forces that may drive this result. We first examine if the *market price* adjusts for the effect of conservatism included in future earnings. Table 3 presents results of a cross-sectional time-series regression where the dependent variable is the 12-month-ahead *actual* stock price scaled by the closing price three trading days prior to the target price release date (P_{it}).

$$P_{it} = \gamma_0 + \gamma_1 EPS_{it+1} + \gamma_2 \Delta Conservatism_{it+1} + \Sigma\, \gamma_k Control_k + \varepsilon'. \quad (5)$$

An increase (decrease) in conservatism results in lower (higher) reported earnings, EPS_{it+1}, but does not have a similar downward (upward) effect on the present value of future cash flows. Therefore, if investors adjust for the effect of conservatism on earnings in deriving the stock price, we expect a positive coefficient on EPS_{it+1} ($\gamma_1 > 0$) and on $\Delta Conservatism_{it+1}$ ($\gamma_2 > 0$). To elaborate, when EPS is conservatively determined, including only EPS_{it+1} and controls in regression (5) will fail to differentiate the effect of EPS with high versus low conservatism (since γ_1 is the same for all firms). The inclusion of $\Delta Conservatism_{it+1}$ compensates for the effect of conservatism on EPS. If $\Delta Conservatism$ is positive (so that EPS is low), investors will make a positive adjustment for conservatism, while if $\Delta Conservatism$ is negative (so that EPS is high), investors will make a negative adjustment for conservatism. Both these cases will result in a positive coefficient on $\Delta Conservatism_{it+1}$ since the negative adjustment in the latter case is made for negative $\Delta Conservatism$. Regression (5) is estimated at the firm-year level (which explains the shrinkage in sample size relative to previous tables). We fix the valuation date relative to the target price issuance date of one randomly selected analyst following the firm in a given year. Results based on realized and

forecasted values of $\Delta Conservatism_{it+1}$ are reported in Table 3, columns (1) and (2), respectively. Note that P_{it}, EPS_{it+1}, and $\Delta Conservatism_{it+1}$ are scaled by the closing price three trading days prior to target price release date. We include *Book-to-Market*, *Size*, *Beta*, *Past Returns*, *Long-Term Growth*, *IB-Rank* and *Intangible Intensity* as control variables.

[Insert Table 3 here]

The coefficient estimate on EPS_{it+1} is positive and significant as expected. More importantly, we find that the coefficient estimate on $\Delta Conservatism_{it+1}$ is positive and significant (realized: 2.470, p-value=<0.001; forecasted: 0.689, p-value=0.003). In examining control variables, we find that firm size is negatively correlated, while book-to-market and past returns are positively correlated with 12-month-ahead stock price (scaled by the closing price three trading days prior to target price release date). Overall, our results indicate that the market adjusts for the effect of conservatism included in future earnings.[30]

In the next two sections, we explore the mechanism through which target prices get biased due to the effect of a change in conservatism. We focus our analysis on the components of target prices: (i) earnings forecasts—the input to analysts' target price estimation, and (ii) the valuation multiple used by analysts to convert their earnings forecasts into target prices.

4.5 Effect of ΔConservatism on earnings forecasts

We first test if analysts include the effect of unconditional conservatism in their earnings forecasts, i.e., that analysts' earnings forecasts are negatively associated with the contemporaneous change in conservatism (Hypothesis 2). Specifically, we estimate a regression of analysts' $EPS\ Forecast_{ijt+1}$ on $\Delta Conservatism_{it+1}$ and other predictor variables to examine whether the analyst's year $t+1$ EPS forecast includes the effect of $\Delta Conservatism_{it+1}$.

$$EPS\ Forecast_{ijt+1} = \alpha_0 + \alpha_1 \Delta Conservatism_{it+1} + \Sigma \alpha_k Control_k + \upsilon, \quad (6)$$

We include control variables that are known to predict future earnings. Specifically, we include *Book-to-*

[30] This result is consistent with Easton and Pae (2004) although their test approach differs from ours.

Market, *Size*, *Past Returns*, *Long-Term Growth*, *IB-Rank* and *Intangible Intensity*. We also include the *EPS* (before Δ*Conservatism*) of year *t* as the predictor of *EPS* (before Δ*Conservatism*) of year *t+1* (assuming a naïve random walk model).[31] Δ*Conservatism*, *EPS* (before Δ*Conservatism*), *EPS Forecast* are scaled by the closing price three trading days prior to the forecast date. Since Δ*Conservatism* is measured as the change in hidden reserves, an increase (decrease) in hidden reserves during the year should have a negative (positive) effect on earnings of the year. If analysts' EPS forecasts are lower (higher) when there is an increase (decrease) in conservatism in the forecast year, we expect the coefficient on $\Delta Conservatism_{it+1}$, α_1, to be negative.

Table 4 presents the results of regression (6). Consistent with our hypothesis that analysts consider the effect of conservatism in forecasting EPS, we find the coefficient estimates on $\Delta Conservatism_{it+1}$ to be negative and significant (realized: -0.156, p-value<0.001; forecasted: -0.315, p-value<0.001).[32, 33] The coefficient estimate on *EPS* (before Δ*Conservatism*) of year *t* is positive and significant as expected. Among other control variables, *Size*, *Book-to-Market*, *Past Returns*, and *Return Volatility* significantly impact analysts' EPS forecasts. Overall, our results support Hypothesis 2, that analysts incorporate the effect of unconditional conservatism into their earnings forecasts.[34]

[Insert Table 4 here]

*4.6 Effect of Δ*Conservatism on analysts' valuation multiples*

[31] *EPS* (before Δ*Conservatism*) equals EPS_{it} plus $\Delta Conservatism_{it}$. We use EPS before Δ*Conservatism* because Δ*Conservatism* is separately included as an explanatory variable.

[32] The intercept of the regression (not including fixed effects) is positive and significant (realized: 0.034, p-value <0.001; forecasted: 0.031, p-value<0.001), reflecting that on average analysts are optimistic in forecasting earnings (untabulated).

[33] We similarly obtain a significant negative relation between the EPS forecast of year *t+2* and Δ*Conservatism* of year *t+2* (untabulated).

[34] In place of Δ*Conservatism* as the independent variable, we also examine the extent to which analysts predict changes in R&D and advertising expenses along with other expenses and sales. In a regression of earnings forecast of year *t+1* on changes in components of realized earnings of year *t+1* (namely, sales, COGS, R&D expense, advertising expense, other expenses and extraordinary items and discontinued operations), we find significant negative coefficient estimates on R&D and advertising expense similar to the coefficient estimates on COGS and other expenses, suggesting that analysts do incorporate these items that reflect the downward effect of conservatism into their earnings forecasts. On the other hand, the coefficient on extraordinary items and discontinued operations is insignificant, consistent with analysts disregarding non-recurring items in their forecasts of core earnings.

We next analyze the second component of the target price—the valuation multiple. We examine whether analysts adjust their valuation multiple for the effect of $\Delta Conservatism$ when converting their earnings forecasts into target prices. We assume that analysts use their EPS forecast and the forward P/E multiple as inputs to their valuation model/heuristic, i.e., $TP_{ijt} = \varphi FEPS_{itj+1}$, where $FEPS_{itj+1}$ is the EPS forecast of analyst *j* for firm *i* year *t+1*, and φ is the forward P/E multiple.[35] We use the forward P/E multiple, motivated by the findings of Asquith et al. (2005) that virtually all analysts' reports in their sample claim to use some variation of earnings multiples to derive target prices. We test Hypothesis 3 by estimating the effect of $\Delta Conservatism$ on the analyst's (target) pricing multiple relative to the market's pricing multiple. We use the market's forward P/E as the comparison benchmark to assess the analyst's adjustment of conservatism, based on our result (in Table 3) that the market price does adjust for the effect of conservatism in future earnings. We estimate regressions of (i) the market's forward P/E multiple, i.e., market price at date *t* divided by $FEPS_{ijt+1}$, and (ii) the analyst's multiple, $TP_{ijt}/FEPS_{ijt+1}$, on $\Delta Conservatism_{it+1}$ and control variables.

$$Multiple_{ijt+1} = \lambda_0 + \lambda_1 \Delta Conservatism_{it+1} + \Sigma \lambda_k Control_k + \omega. \quad (7)$$

We expect a positive coefficient, λ_1, if the multiple is adjusted for $\Delta Conservatism$. We test Hypothesis 3 by jointly estimating the two regressions and testing for the difference in λ_1. We expect a significantly lower effect of $\Delta Conservatism_{it+1}$ on the analyst's target-price-to-earnings multiple relative to the market's price-to-earnings multiple. Table 5, columns (1) and (2), report the results of regression (7) using realized $\Delta Conservatism$ as the independent variable and the market's multiple or the analyst's multiple as the respective dependent variables. Column (3) reports the difference in coefficients and the p-values from a joint estimation of the two regressions. In column (1), we find a positive and significant λ_1 (76.47, p-value<0.001), suggesting that the market adjusts the pricing multiple for the effect of $\Delta Conservatism$.[36] On the other hand, λ_1 in column (2) is insignificant, suggesting that analysts fail to

[35] We thank Stephen Penman for suggesting the test of earnings multiples.
[36] The magnitude of λ_1 reflects that a one standard deviation increase in $\Delta Conservatism$ results in an increase in the P/E multiple by 1.4 (an increase of 7 percent over the unconditional mean P/E of 19.98).

appropriately adjust their pricing multiple for the effect of Δ*Conservatism*. Consistent with Hypothesis 3, in column (3), we find that the difference in λ_1 between columns (1) and (2) is significantly positive (79.30; p-value<0.001).[37] This suggests that relative to the market's pricing multiple, analysts' adjustment of their (target) pricing multiple for the effect of conservatism is significantly lower.[38]

[Insert Table 5 here]

4.6.1 Robustness of valuation model assumed—PEG ratio

In this section, we examine whether analysts adjust for the change in conservatism when deriving target prices assuming that they use the PEG valuation model. Bradshaw (2004) finds that, on average, analysts' stock recommendations are more correlated with heuristics such as the price-earnings-to-growth (PEG) ratio rather than valuations based on present-value models such as the residual income model. Consistent with results in Bradshaw (2004), we use a PEG valuation model to examine whether analysts adjust Δ*Conservatism* included in their earnings and earnings growth forecasts when deriving target prices. The PEG valuation model we use is a simplification of the abnormal earnings growth model in Ohlson and Juettner-Nauroth (2005) as modified by Easton and Monahan (2005). Setting dividends and perpetual growth rate to zero, the value of firm equity (*V*) can be expressed as

$$V_{it} = (FEPS_{ijt+2} - FEPS_{ijt+1}) / r^2 = \Delta FEPS_{ijt+2} / r^2, \quad (8)$$

where $\Delta FEPS_{ijt+2}$ is the forecasted earnings growth and *r* is the expected rate of return. To test if analysts adjust for the change in conservatism included in their forecasted earnings and earnings growth when determining their target price, we estimate the following regression:

$$TP_{ijt} = \beta_0 + \beta_1 \Delta FEPS_{ijt+2} + \beta_2 (\Delta Conservatism_{it+2} - \Delta Conservatism_{it+1}) +$$
$$\beta_3 \Delta FEPS_{ijt+2} (\Delta Conservatism_{it+2} - \Delta Conservatism_{it+1}) + \xi. \quad (9)$$

We scale all variables by the closing price three trading days prior to the target price release date. The

[37] Results using forecasted Δ*Conservatism* also show a significant difference between the coefficients (λ_1) of the two regressions (23.77; p-value=0.018), untabulated.

[38] As a robustness test, we re-estimate regression (7) using $FEPS_{ijt}$ and $\Delta Conservatism_{it}$, assuming that analysts at date *t-1* use forecasts of year *t* rather than year *t+1* to estimate the date-t target price and obtain substantially similar results (untabulated).

coefficient on $\Delta FEPS_{ijt+2}$, β_1, reflects the baseline PEG multiple and is expected to be positive and significant. Since forecasted earnings growth, $\Delta FEPS_{ijt+2}$, is lower if the forecasted change in conservatism increases, i.e., if ($\Delta Conservatism_{it+2}$ - $\Delta Conservatism_{it+1}$) > 0, analysts should adjust their target prices by placing a greater weight on their forecasted earnings growth. Thus, if analysts adjust the PEG multiple for conservatism, we expect a positive and significant coefficient on the interaction term, β_3. Our results, however, show that the coefficient estimate on the interaction term is insignificant (untabulated).

Overall, our results suggest that, regardless of the earnings-based valuation model/heuristic we assume, analysts on average do not appropriately adjust their pricing multiples for the effect of conservatism included in their earnings forecasts when converting these forecasts into target prices. We acknowledge that this part of our analysis is based on assumptions about the valuation model used by analysts to derive their target prices. Our objective, however, is to show that *on average* analysts do not appear to adjust for conservatism when converting their earnings forecasts into price targets. In contrast, our results in Table 3 suggest that, on average, the market adjusts for the conservatism in earnings when valuing a firm. Although, market prices on average adjust for the effect of conservatism, it is possible that distortions of stock price occur in some cases, especially for firms where the magnitude of $\Delta Conservatism$ is large. In the next section, we examine whether the market understands that analysts' target prices are biased due to conservatism.

4.7 Market's assessment of target prices in the presence of conservative accounting

If analysts underestimate (overestimate) target prices for firms with a high (low) change in unconditional conservatism, it is possible that investors, when reacting to target prices, do not fully appreciate this bias, leading to stock undervaluation (overvaluation). If such mispricing occurs, we would expect to observe positive (negative) abnormal returns in subsequent periods when the information becomes apparent to investors. To examine this possibility, we estimate a cross-sectional, time-series regression of future returns on target prices and control variables that are known to explain the cross-section of returns:

$$R_{it+1} = \psi_0 + \psi_1 Q(TP/P)_{it} + \psi_2 Beta_{it} + \psi_3 Size_{it} + \psi_4 B/M_{it} + \psi_5 R_{it} + \psi_6 Accruals_{it} + \psi_7 NOA_{it} + \eta \quad (10)$$

We form target price quintiles based on the I/B/E/S mean consensus target price for a firm in the fourth

month after the fiscal-year end of year *t*, divided by price at the end of the fourth month. The independent variable, *Q(TP/P)*, equals target price quintiles scaled such that they vary from zero to one. This enables us to interpret the coefficient ψ_1 as the return differential between quintile 5 and quintile 1. R_{it+1} equals security returns of firm *i* over the year *t+1*, i.e., over a period of 12 months beginning at the end of the fourth month after the fiscal-year end.[39] The control variables include the *Beta*, *Size*, *Book-to-Market* (*B/M*) at the end of the previous fiscal-year, price momentum measured as returns over a period of 12 months ending in the fourth month after the fiscal-year end (*Past Returns*=R_{it}), *Accruals* of the previous year (measured as income before extraordinary items minus cash flow from operations before extraordinary items, scaled by average total assets), and net operating assets (scaled by average total assets). We include accruals and net operating assets (*NOA*) because these variables are shown by prior research to be related to future returns (Sloan 1996; Hirshleifer et al. 2004).[40] Note that regression (10) is not a factor model but simply examines the association between the ratio of target-price to price and future returns, after controlling for variables that are known to be correlated with returns in the cross-section; hence, the intercept does not reflect abnormal returns. We form quintiles of Δ*Conservatism* in the earnings of year *t*, divided by price at the end of the fourth month after the fiscal-year end, and estimate regression (10) for each quintile of Δ*Conservatism*.

Table 6 presents results of regression (10) estimated for each Δ*Conservatism* quintile. From panel A, column (1), the coefficient estimate on *Q(TP/P)* for the highest Δ*Conservatism* quintile is negative and significant, indicating that target price is negatively correlated with future returns.[41] The coefficient estimate of -0.157 reflects the differential future excess return between *Q(TP/P)*=5 and *Q(TP/P)*=1.

[39] We use the CRSP delisting return, if a firm is delisted during the next twelve months. If the delisting return is not available on CRSP, we follow Shumway (1997) and assume a delisting return of -30 percent for firms delisted on account of poor performance and zero for other firms.

[40] Our results are robust to the inclusion of year and industry fixed effects in regression (10).

[41] The coefficients on the control variables are insignificant at least partially due to the fact that the analysis is conducted for subsamples of conservatism quintiles while prior research shows that these variables have significant return predictability in the overall population of Compustat/CRSP firms. When we estimate the return regression for the entire sample, instead of Δ*Conservatism* quintiles, we find significant coefficients on *B/M* (0.004, p-value=0.022) and *NOA* (-0.082, p-value=0.004), untabulated.

Compared to our return differential of 15.7 percent, Penman and Zhang (2002) obtain a differential (size-adjusted) return of 8.95 percent between the highest and lowest deciles of their conservatism measure (their Table 5B). Our two-level partitioning scheme, based on Δ*Conservatism* and *Q(TP/P)*, obtains a substantially higher return differential.[42] From columns (1) to (4), the magnitude of the coefficient on *Q*(*TP/P*) monotonically decreases from the highest Δ*Conservatism* quintile 5 up to quintile 2, and increases again for quintile 1 in column (5). Note from row (1) that the mean Δ*Conservatism* for quintile 1 is negative.

[Insert Table 6 here]

Panel B of Table 6 shows results of regression (10) with separate coefficients estimated for the low target price group, which includes the lowest two *Q(TP/P)* quintiles, and the high target price group, which includes the highest two *Q(TP/P)* quintiles (the intercept captures the effect for quintile 3). From column (1), when Δ*Conservatism* is large, it is clear that the significant negative correlation between target price and future returns (reported in panel A) is mainly contributed by the positive and significant future excess returns earned by the low *Q(TP/P)* group (7.9 percent). Thus, it appears that the underestimation of target prices due to increase in conservatism reflected in a relatively low target price leads to investor undervaluation of stock prices. On the other hand, from column (2), when Δ*Conservatism* is negative (reflecting decreasing investments), the negative correlation between target price and future returns is mainly attributed to the negative future excess returns earned by the high *Q(TP/P)* group (-4.4 percent). In this case, the negative Δ*Conservatism* leads to overestimation of the target price, and thus negative future excess returns for the highest target price group. Overall, our results indicate that the under-/over-estimation of target prices due to extreme changes in conservatism is followed by future returns in the predicted direction suggesting that market prices are distorted. Moreover, our results hold after controlling for firm characteristics that are known to be related to returns, such as size, B/M, momentum, accruals and NOA.

[42] Differential future excess returns are negative and significant at -17.8 percent, -15.4 percent and -9.1 percent for 1999-2003, 2004-2008, and 2009-2013, respectively, although the significance is weak in the last sub-period.

5. Concluding Remarks

This paper examines whether analysts, when using their earnings forecasts as inputs to obtain target prices, adjust for the effect of unconditional conservatism included in their earnings forecasts. Unconditional conservatism affects sustainable earnings when investment in assets is not in steady state. Hence, the effect of conservatism on earnings needs to be taken into account when earnings are used as a valuation input. While some sophisticated analysts may use rigorous valuation models such as the DCF, the majority of analysts use valuation heuristics based on multiples, such as the P/E, or the PEG ratio, to derive their target prices. Analysts' reports typically exclude non-recurring items, but rarely (if ever) mention any adjustments made on account of conservatism, say for the effect of changes in R&D investment, when forecasting target prices.[43] Thus, it is plausible that on average analysts do not adjust their target prices for the change in conservatism that affects their earnings forecasts.

Consistent with our hypothesis, we find that target price errors are systematically related to change in unconditional accounting conservatism. While we find that change in conservatism is incorporated into analysts' earnings forecasts, we find that, on average, analysts fail to appropriately adjust for conservatism reflected in their earnings forecasts when estimating target prices. Further, we find that more sophisticated analysts adjust for the effect of conservatism to a greater extent relative to other analysts, although their target price estimates also exhibit significant bias due to conservatism. While on average the market takes the effect of conservatism into account when pricing firms' forward earnings, we find evidence of stock price distortions for firms where changes in conservatism are extreme. Firms with relatively low target prices and large increase in conservatism earn high future excess returns, whereas firms with high target prices and large decrease in conservatism earn negative future excess returns. Thus, it appears that, when

[43] In relation to market-wide valuations by analysts, anecdotes from the financial press typically discuss *historical* ratios as the valuation basis for the S&P 500 or the Dow. For example, the Wall Street Journal article on August 24, 2009, "Bulls of March look set to trade in their horns" by Mark Gongloff, quotes "*the chairman of Boston asset-management firm GMO and his colleagues say the S&P 500 has zoomed right past what they consider fair value of about 880, based on earnings estimates and historical price-to-earnings ratios.*" Historical price-to-earnings ratios obviously do not take into account the effect of market-wide changes in investment, such as R&D investment, which can be significant as indicated by R&D booms and declines in Brown et al. (2009).

the change in conservatism is extreme, investors do not fully appreciate the conservatism bias in analysts' target prices.

While our paper shows that distortions of analysts' target prices and in turn market prices may arise as a consequence of conservative accounting, we do not intend our results to be viewed as evidence questioning the merits of conservative accounting in general. The role of conservative accounting in efficient contracting and other scenarios has been demonstrated by prior empirical and conceptual work. Rather, our findings advise caution to analysts in their use of short-cut earnings-based valuation heuristics in deriving their target prices when earnings are determined conservatively.

Appendix 1

Steady-state example

Consider the following example of a firm in a steady state. The firm spends \$10 per share on R&D every year ($R\&D_t$ = \$10 for all years t=...., -2, -1, 0, 1, 2, ...) and there are no other expenses. The R&D expenditure is incurred evenly during the year. Every dollar of R&D generates \$1.4 dollars of sales spread evenly over the following five years. Consistent with the assumptions used to calculate the R&D reserve in section 3.2, let us assume the hypothetical capitalization of R&D and straight-line amortization of the resulting R&D asset over the following five years. At the end of each year, *R&D Reserve* = $0.9\times R\&D_t$ + $0.7\times R\&D_{t-1}$ + $0.5\times R\&D_{t-2}$ + $0.3\times R\&D_{t-3}$ + $0.1\times R\&D_{t-4}$ = \$25. Since sales are generated evenly over the following 5 years, they equal $1.4*(R\&D_t/10 + R\&D_{t-1}/5 + R\&D_{t-2}/5 + R\&D_{t-3}/5 + R\&D_{t-4}/5 + R\&D_{t-5}/10)$ = \$14. The facts are summarized in the table below (all amounts are dollars per share).[44]

Year	.., -2, -1, 0	1	2	3	4	5	6	7
Sales	14	14	14	14	14	14	14	14
R&D expense	10	10	10	10	10	10	10	10
Earnings	4	4	4	4	4	4	4	4
R&D Reserve	25	25	25	25	25	25	25	25
Δ*Conservatism*	0	0	0	0	0	0	0	0
Earnings before Δ*Conservatism*	4	4	4	4	4	4	4	4

Assume for simplicity that the cost of equity, r, is 10 percent, and sales and R&D expenses are received and paid in cash, so free cash flow (*FCF*) is Sales minus R&D expense = \$14-\$10 = \$4 in every year. The per share value of the firm's equity, P_0, is FCF_1/r = \$4/0.10 = \$40 and the P/E multiple is P_0/EPS_1 = 40/4 = 10. Suppose that in this simple steady-state case, analysts correctly forecast one-year-ahead (Year 1) earnings forecast, $FEPS_1$ = \$4.00, and use the steady-state P/E multiple of 10 to derive their target price. Then the target price will be $FEPS_1$*P/E = \$4*10 = \$40, which equals the fundamental value.

[44] Calculations: $Sales_t = 1.4*(R\&D_t/10 + R\&D_{t-1}/5 + R\&D_{t-2}/5 + R\&D_{t-3}/5 + R\&D_{t-4}/5 + R\&D_{t-5}/10) = 1.4*(10/10 + 10/5 + 10/5 + 10/5 + 10/5 + 10/10) = \$14$; $Earnings_t = Sales_t$ - R&D $expense_t$ = \$14 - \$10 = \$4; Δ*Conservatism* =Change in *R&D Reserve*=(25–25)=\$0; Earnings before Δ*Conservatism* = (Earnings + Δ*Conservatism*) = \$4+0 = \$4.

Non-steady state example

Now consider a firm with the same data except that there is a one-time increase in R&D expenditure from $10 to $11 in Year 1. Sales and *R&D Reserve* will increase in Years 1-6, while earnings will first decrease in Year 1 due to a mismatch of expenses and revenues and then increase in Years 2-6 (all amounts are dollars per share):[45]

Year	., -2, -1, 0	1	2	3	4	5	6	7
Sales	14	14.14	14.28	14.28	14.28	14.28	14.14	14
R&D expense	10	11	10	10	10	10	10	10
Earnings	**4**	**3.14**	**4.28**	**4.28**	**4.28**	**4.28**	**4.14**	**4**
R&D Reserve	25	25.9	25.7	25.5	25.3	25.1	25	25
Δ*Conservatism*	0	0.9	-0.2	-0.2	-0.2	-0.2	-0.1	0
Earnings before Δ*Conservatism*	4	4.04	4.08	4.08	4.08	4.08	4.04	4

Assume again that the cost of equity, *r*, is 10 percent and sales and R&D expense are all cash transactions. The net present value of the additional one dollar of R&D investment in Year 1 is $0.104[46] and therefore the per share value of the firm's equity, P_0, is $40+$0.104 = $40.104, where $40 is the firm value without the additional one dollar of R&D investment, i.e., P_0 in the steady state example. The correct P/E multiple in Year 0 is P_0/EPS_1 = 40.104/3.14 =12.77 is higher than the steady-state P/E of 10. The higher P/E multiple compensates for the lower earnings due to the increase in conservatism. Consider the following two cases.

Case 1: Suppose the analyst's earnings forecast fully incorporates the increase in conservatism, i.e., $FEPS_1 = EPS_1$ = $3.14. Also, suppose the same steady-state P/E multiple of 10 is used to derive the target price. Then the target price will be $FEPS_1$*P/E =$3.14*10= $31.4, which is biased downward relative to the fundamental value of $40.104.

Case 2: Now, suppose the analyst's earnings forecast incorporates the increase in conservatism partially,

[45] For example, in Year 1, $Sales_t = 1.4*(R\&D_t/10 + R\&D_{t-1}/5 + R\&D_{t-2}/5 + R\&D_{t-3}/5 + R\&D_{t-4}/5 + R\&D_{t-5}/10) = 1.4*(11/10 + 10/5 + 10/5 + 10/5 + 10/5 + 10/10) = \$14.14$; $Earnings_1 = \$14.14 - \$11 = \$3.14$; $R\&D\ Reserve_1 = (0.9*11 + 0.7*10 + 0.5*10 + 0.3*10 + 0.1*10) = \$25.9$; $\Delta Conservatism_1$ = Change in *R&D Reserve* = 25.9 - 25 = $0.9; and Earnings before $\Delta Conservatism_1 = (Earnings_1 + \Delta Conservatism_1) = (\$3.14 + \$0.9) = \$4.04$.

[46] The net present value of the additional dollar of R&D expenditure in Year 1 including the return (i.e., future sales) generated by this R&D expenditure equals $[(-1)/1.1 + (1.4/10)/1.1 + (1.4/5)/1.1^2 + (1.4/5)/1.1^3 + (1.4/5)/1.1^4 + (1.4/5)/1.1^5 + (1.4/10)/1.1^6] = 0.104$, where the first term, (-1)/1.1, is the present value of the $1 paid for R&D and the remaining terms reflect the present value of future sales generated by the $1 R&D expenditure.

say next-year's (Year 1) earnings forecast reflects 50 percent of the EPS decrease due to increase in R&D, resulting in the forecast of $FEPS_1$ = \$3.57 [\$4.00+0.5*(\$3.14-\$4.00)], where \$3.14 is the correct EPS_1 and \$4.00 is the EPS without the additional dollar of R&D investment, i.e., EPS_1 in the steady state example. Again, suppose the same steady-state P/E multiple of 10 is used to derive the target price. Then the target price will be $FEPS_1$*P/E =\$3.57*10= \$35.7, which is still biased downward relative to the fundamental value of \$40.104.

The examples in Cases 1 and 2 show that the target price bias arises regardless of whether analysts incorporate the increase in conservatism in their earnings forecasts partially or fully. The source of the target price bias is that the valuation multiple, i.e., P/E multiple, is not appropriately adjusted to compensate for the lower future earnings forecasts due to an increase in forecasted conservatism.

Appendix 2: Variable definitions

Variable	Definition
Accruals	Income before extraordinary items minus cash flow from operations before extraordinary items, scaled by average total assets.
Advertising Reserve	$Advertising\ Reserve_t = ADV_t + 1/3 \times ADV_{t-1}$, scaled by the closing price three trading days prior to the target price release date; *ADV*=advertising expense.
Analyst experience	Analyst experience measured as the number of years an analyst has covered a given firm.
Analyst's Multiple	Analyst's target price multiple, measured as $TP_{ijt}/FEPS_{ijt+1}$, where TP_{ijt} is the target price of firm *i* issued by analyst *j* for year *t* and $FEPS_{ijt+1}$ is the EPS forecast of firm *i* issued by analyst *j* for year *t+1*.
Beta	CAPM beta estimated from a regression of firm monthly returns minus the risk-free rate (one-month T-bill rate) on the value-weighted market index minus the risk-free rate over a period of 60 months preceding the target price month.
Book-to-Market (*B/M*)	The ratio of book value of equity to market value of equity at the beginning of the target-price issuance year.
Brokerage size	Brokerage firm size measured as the number of analysts belonging to a brokerage firm.
$\Delta Conservatism_{it+1}$	Change in conservatism of firm *i* year *t*+1, measured as the sum of the difference between the ending and beginning balances of *R&D Reserve*, *Advertising Reserve*, and *Inventory Reserve* (details in section 3.2). Change in conservatism is scaled by the closing price three trading days prior to the target price release date.
EPS_{it+1}	Actual reported EPS before extraordinary items and discontinued operations of firm *i* for year *t*+1 (from I/B/E/S), scaled by the closing price three trading days prior to the target price release date.
EPS Forecast	One-year-ahead analyst EPS forecast issued within a period of 30 days prior to the release of the target price, scaled by the closing price three trading days prior to the target price release date.
EPS Forecast Error	EPS forecast error measured as the I/B/E/S actual EPS minus the forecasted EPS, scaled by the closing price three trading days prior to the target price release date.
$FEPS_{ijt+1}$	EPS forecast of firm *i* for year *t+1* issued by analyst *j* within a period of 30 days prior to the release of the target price by the same analyst.

Forecasted $\Delta Conservatism_{it+1}$	Forecasted change in conservatism $\Delta Conservatism_{it+1}$ for firm *i* year *t*+1, estimated using a firm-specific second-order autoregressive model of changes in conservatism over a period of 20 years ending in the year prior to the target price issuance year. Forecasted change in conservatism is scaled by the closing price three trading days prior to the target price release date.
IB-Rank	Investment-banking reputation ranking of brokerage firms. *IB-Rank* equals one if the brokerage firm's Carter-Manaster reputation ranking is nine, 0.5 if the ranking is between zero and eight, and zero if the ranking is missing.
Intangible Intensity	R&D and Advertising expense summed over the prior three years divided by total assets at the beginning of the target price year.
Inventory Reserve	LIFO reserve reported in the annual report, scaled by the closing price three trading days prior to the target price release date.
Long-Term Growth	Long-term growth forecast issued by an analyst within a period of 30 days prior to the release of the target price by the same analyst.
Market's Multiple	The market's forward P/E multiple, measured as the market price at date *t* divided by $FEPS_{ijt+1}$, where $FEPS_{ijt+1}$ is the EPS forecast for firm *i* year *t+1* issued by analyst *j*.
NOA	Net operating assets scaled by lagged total assets.
P_{it}	Actual stock price of firm *i* at the end of 12 months after the month of target price issuance, scaled by the closing price three trading days prior to the target price release date.
Past Returns (R_{it})	Previous year's stock returns of firm *i* measured over a one-year period ending with the current year's earnings announcement date.
R_{it+1}	Future stock return of firm *i* measured over a period of 12 months beginning at the end of the fourth month after the fiscal-year end.
Realized $\Delta Conservatism_{it+1}$	Realized value of the change in conservatism $\Delta Conservatism_{it+1}$ for firm *i* year *t*+1. Realized change in conservatism is scaled by the closing price three trading days prior to the target price release date.
R&D Reserve	$R\&D\ Reserve_t = 0.9\times R\&D_t + 0.7\times R\&D_{t-1} + 0.5\times R\&D_{t-2} + 0.3\times R\&D_{t-3} + 0.1\times R\&D_{t-4}$, scaled by the closing price three trading days prior to the target price release date; *R&D*=R&D expense.
ROA	Return on assets, measured as income before extraordinary items and discontinued operations divided by average total assets.
Return Volatility	The standard deviation of daily returns over one year prior to the earnings announcement date of the current year, multiplied by 100.
Size	Firm size measured as the log of market value of equity at the beginning of the target price issuance year.
TP_{ijt}	12-month target price of firm *i* for year *t* issued by analyst *j* at date *t*-1. Our analyses are based on the first target price issued by an

	analyst within the three-month window after the previous year's earnings announcement.
TP/P	12-month target price (*TP*) divided by the closing price three trading days prior to the target price release date.
TPFE	Target price error, measured as the actual price at the end of twelve months following the month of target price issuance minus the target price, scaled by the closing price three trading days prior to the target price release date.

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Figure 1 Time-line for target price estimation

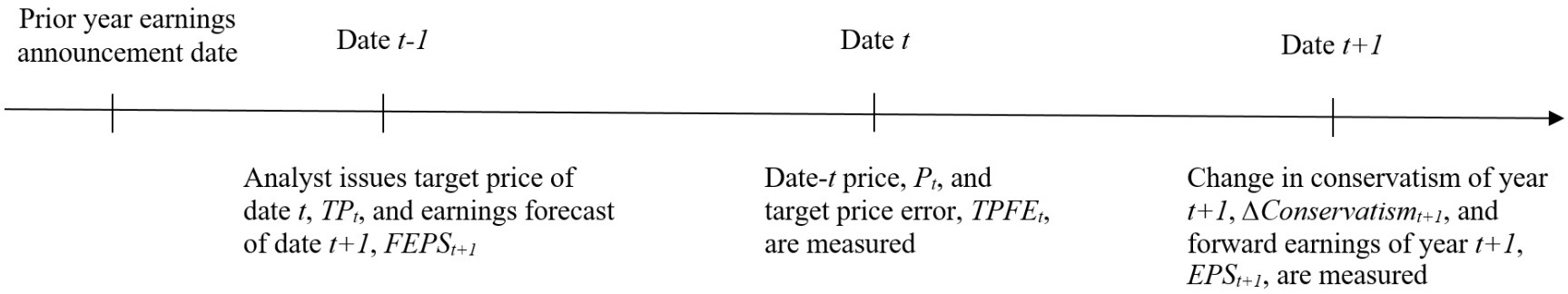

TABLE 1
Descriptive statistics

Panel A: Descriptive statistics of sample firms over the full sample period, 1999-2013

Variables	N	Mean	Median	SD
Analysts' Forecasts:				
EPS Forecast	95,058	0.0599	0.0570	0.0384
TP/P	95,058	1.2010	1.1749	0.2226
Long-Term Growth	38,600	0.1841	0.1500	0.3145
Analysts' Forecast Errors:				
EPS Forecast Error	95,058	-0.0043	0.0004	0.0336
TPFE	95,058	-0.0658	-0.0748	0.5202
Actuals:				
EPS	22,236	0.0487	0.0523	0.0610
EPS (before ∆*Conservatism*)	22,236	0.0534	0.0565	0.0665
∆*Conservatism*	22,236	0.0047	0.0008	0.0178
∆ *R&D Reserve*	22,236	0.0036	0.0000	0.0122
∆ *Advertising Reserve*	22,236	0.0009	0.0000	0.0064
∆ *Inventory Reserve*	22,236	0.0002	0.0000	0.0021

Table 1 continued...
Panel B: Descriptive statistics of sample firms over three sub-periods.

Variables	N	Mean	Median	SD
1999-2003				
TP/P	14,528	1.2881	1.2407	0.2678
TPFE	14,528	-0.1639	-0.1953	0.6210
EPS Forecast Error	14,528	-0.0057	-0.0002	0.0308
EPS	5,353	0.0428	0.0440	0.0603
∆*Conservatism*	5,353	0.0057	0.0010	0.0186
2004-2008				
TP/P	33,004	1.1866	1.1702	0.2005
TPFE	33,004	-0.1912	-0.1885	0.4781
EPS Forecast Error	33,004	-0.0058	0	0.0326
EPS	8,579	0.0449	0.0496	0.0570
∆*Conservatism*	8,579	0.0053	0.0013	0.0175
2009-2013				
TP/P	47,526	1.1844	1.1613	0.2158
TPFE	47,526	0.0512	0.0189	0.4869
EPS Forecast Error	47,526	-0.0028	0.0008	0.0350
EPS	8,304	0.0564	0.0605	0.0647
∆*Conservatism*	8,304	0.0035	0.0002	0.0175

Table 1 continued...
Panel C: Descriptive statistics of sample firms by industry groups

Industry:	Consumer	Manufact	HiTech	Health	Other
N	**19,946**	**22,459**	**29,291**	**9,069**	**14,293**
TP/P					
Mean	1.1705	1.2052	1.2183	1.1876	1.2100
Median	1.1547	1.1753	1.1905	1.1628	1.1819
SD	0.1938	0.2170	0.2435	0.2061	0.2294
TPFE					
Mean	-0.0210	-0.0394	-0.1164	-0.0431	-0.0809
Median	-0.0346	-0.0438	-0.1340	-0.0596	-0.0845
SD	0.4668	0.4995	0.5733	0.4756	0.5259
EPS Forecast Error					
Mean	-0.0038	-0.0043	-0.0039	-0.0007	-0.0080
Median	0.0004	-0.0002	0.0008	-0.0010	-0.0009
SD	0.0290	0.0360	0.0360	0.0211	0.0367
N	**4,939**	**5,162**	**6,459**	**2,132**	**3,544**
EPS					
Mean	0.0580	0.0579	0.0369	0.0432	0.0473
Median	0.0598	0.0599	0.0413	0.0473	0.0500
SD	0.0527	0.0621	0.0628	0.0522	0.0674
∆*Conservatism*					
Mean	0.0028	0.0028	0.0088	0.0073	0.0013
Median	0.0006	0.0000	0.0055	0.0038	0.0000
SD	0.0169	0.0159	0.0215	0.0173	0.0117

Our sample includes 12-month target prices issued by analysts within a period of three months following the previous year's earnings announcement. *EPS* (before ∆*Conservatism*) equals *EPS* plus ∆*Conservatism*. All variables are defined in Appendix 2. All variables (except long-term growth) are scaled by the closing price three trading days prior to the target price release date. In panel C, industry portfolios are based on the Fama-French five-industry classification obtained from Kenneth French's website. Industry portfolio composition is as follows: *Consumer* includes consumer durables, non-durables, wholesale, retail, and some services (laundries, repair shops); *Manufacturing* includes manufacturing, energy and utilities; *HiTech* includes business equipment, telephone and television transmission; *Health* includes healthcare, medical equipment, and drugs; *Other* includes mines, construction, building materials, transport, hotels, business services, entertainment and finance.

TABLE 2
Relation between (signed) target price forecast errors and Δ*Conservatism*

Panel A: Results of the regression of analysts' target price errors on Δ*Conservatism* and other controls

$$TPFE_{ijt} = \theta_0 + \theta_1 \Delta Conservatism_{it+1} + \Sigma \theta_k Control_k + \varepsilon \quad (4)$$

Dependent variable is (signed) target price error ($TPFE_{ijt}$)

Variables	***Realized* Δ*Conservatism*** (1)	***Forecasted* Δ*Conservatism*** (2)
Δ*Conservatism*$_{it+1}$	**2.430**	**1.386**
	(<0.001)	***(0.007)***
Intangible Intensity	-0.003	-0.047
	(0.929)	*(0.164)*
IB-Rank	0.019	0.018
	(<0.001)	*(<0.001)*
Long-Term Growth	-0.018	-0.010
	(0.002)	*(0.059)*
Book-to-Market	0.130	0.112
	(<0.001)	*(<0.001)*
Size	-0.012	-0.017
	(<0.001)	*(<0.001)*
Past Returns	-0.027	-0.046
	(<0.001)	*(<0.001)*
Return Volatility	-0.016	-0.007
	(<0.001)	*(0.218)*
EPS Forecast Error$_{ijt}$	3.648	3.844
	(<0.001)	*(<0.001)*
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	*Yes*	*Yes*
Adj-R^2	*0.41*	*0.43*
N	95,058	57,260

Table 2 continued…

Panel B: Effect of analyst sophistication on the relation between analysts' (signed) target price errors and Δ*Conservatism*

Dependent variable is (signed) target price error ($TPFE_{ijt}$)

Variables	**Brokerage size**		**Analyst Experience**		**Forecast Quality**	
	Realized Δ*Conservatism*	*Forecasted* Δ*Conservatism*	*Realized* Δ*Conservatism*	*Forecasted* Δ*Conservatism*	*Realized* Δ*Conservatism*	*Forecasted* Δ*Conservatism*
	(1)	(2)	(3)	(4)	(5)	(6)
High Group	0.054	0.053	0.007	-0.001	0.035	0.009
	(<0.001)	*(<0.001)*	*(0.044)*	*(0.839)*	*(<0.001)*	*(0.360)*
Δ*Conservatism*$_{it+1}$	**2.811**	**1.829**	**2.741**	**1.751**	**2.675**	**1.746**
	(<0.001)	***(0.003)***	***(<0.001)***	***(0.002)***	***(<0.001)***	***(0.002)***
Δ*Conservatism*$_{it+1}$High Group***	**-0.508**	**-0.588**	**-0.935**	**-0.843**	**-0.909**	**-1.139**
	(0.063)	***(0.255)***	***(<0.001)***	***(0.037)***	***(0.016)***	***(0.078)***
Control Variables	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Adj-R^2	0.42	0.43	0.41	0.43	0.41	0.43
N	95,058	57,260	95,058	57,260	95,058	57,260
F-test (p-value):						
Δ*Conservatism* + Δ*Conservatism*High Group*	*(<0.001)*	*(0.021)*	*(<0.001)*	*(0.091)*	*(<0.001)*	*(0.350)*

p-values relate to *t*-statistics corrected for clustering of standard errors by firm and are reported in parentheses below the related coefficients. Bold text indicates the variables of interest. Target price error ($TPFE_{ijt}$), *EPS Forecast Error*$_{ijt}$ and Δ*Conservatism*$_{it+1}$ are scaled by the closing price three trading days prior to the target price release date. In panel B, "Control Variables" is the set of the following control variables: *Intangible Intensity*, *IB-Rank*, *Long-Term Growth*, *Book-to-Market*, *Size*, *Past Returns*, *Return Volatility*, *and EPS Forecast Error*. "*High Group*" is an indicator variable for analyst sophistication that equals one (i) when the analyst belongs to a large brokerage house (≥25 analysts) in columns (1-2), and (ii) when the analyst has ≥5 years of firm-specific experience in columns (3-4). For columns (5-6), "*High Group*" represents high quality forecasters and is an indicator variable that equals one for observations in (i) the top quintiles of Δ*Conservatism* and long-term growth, or (ii) the bottom quintiles of Δ*Conservatism* and long-term growth. All other variables are defined in Appendix 2.

TABLE 3
Effect of conservatism on actual prices–Results of the regression of actual prices on EPS and Δ*Conservatism*

$$P_{it} = \gamma_0 + \gamma_1 EPS_{it+1} + \gamma_2 \Delta Conservatism_{it+1} + \Sigma\, \gamma_k\, Control_k + \varepsilon' \quad (5)$$

Dependent variable is the actual price (P_{it})

Variables	***Realized* Δ*Conservatism*** (1)	***Forecasted* Δ*Conservatism*** (2)
EPS_{it+1}	3.905	1.240
	(<0.001)	*(<0.001)*
Δ*Conservatism*$_{it+1}$	**2.470**	**0.689**
	(<0.001)	***(0.003)***
Intangible Intensity	0.095	0.030
	(<0.001)	*(0.079)*
IB-Rank	-0.005	0.003
	(0.518)	*(0.513)*
Long-Term Growth	0.010	0.030
	(0.327)	*(<0.001)*
Book-to-Market	0.055	0.116
	(<0.001)	*(<0.001)*
Size	-0.033	-0.004
	(<0.001)	*(0.002)*
Past Returns	0.078	0.217
	(<0.001)	*(<0.001)*
Beta	0.007	0.004
	(0.160)	*(0.223)*
Year Fixed Effects	*Yes*	*Yes*
Industry Fixed Effects	*Yes*	*Yes*
Adj-R^2	*0.44*	*0.34*
N	*19,213*	*11,325*

[a]*p*-values relate to *t*-statistics corrected for clustering of standard errors by firm and are reported in parentheses below the related coefficients. Bold text indicates the variable of interest. P_{it}, EPS_{it+1} and $\Delta Conservatism_{it+1}$ are scaled by the closing price three trading days prior to the target price release date. All variables are defined in Appendix 2.

TABLE 4
Effect of conservatism on analysts' EPS forecasts: Results of the regression of analysts' EPS forecast on Δ*Conservatism* of the forecast year and control variables:

$$EPS\ Forecast_{ijt+1} = \alpha_0 + \alpha_1 \Delta Conservatism_{it+1} + \Sigma \alpha_k\ Control_k + \upsilon \qquad (6)$$

Dependent variable is the EPS forecast for year *t+1* (*EPS Forecast*$_{ijt+1}$)

Variables	***Realized* Δ*Conservatism*** (1)	***Forecasted* Δ*Conservatism*** (2)
Δ*Conservatism*$_{it+1}$	**-0.156**	**-0.315**
	(<0.001)	***(<0.001)***
EPS$_{it}$ (before Δ*Conservatism*)	0.350	0.406
	(<0.001)	*(<0.001)*
Intangible Intensity	-0.021	-0.014
	(<0.001)	*(<0.001)*
IB-Rank	0.000	0.000
	(0.231)	*(0.627)*
Long-Term Growth	0.002	0.000
	(0.018)	*(0.935)*
Book-to-Market	0.008	0.010
	(<0.001)	*(<0.001)*
Size	0.001	0.001
	(<0.001)	*(<0.001)*
Past Returns	0.004	0.006
	(<0.001)	*(<0.001)*
Return Volatility	-0.003	-0.002
	(<0.001)	*(<0.001)*
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Adj-R^2	0.43	0.45
N	95,058	57,260

p-values relate to *t*-statistics corrected for clustering of standard errors by firm and are reported in parentheses below the related coefficient. Bold text indicates the variable of interest. *EPS Forecast*$_{ijt+1}$, *EPS*$_{it}$ (before Δ*Conservatism*), and Δ*Conservatism*$_{it+1}$ are scaled by the closing price three trading days prior to the target price release date. *EPS*$_{it}$ (before Δ*Conservatism*) equals *EPS*$_{it}$ plus Δ*Conservatism*$_{it}$. All other variables are defined in Appendix 2.

TABLE 5
Comparison of the effect of conservatism on analysts' target price multiple and market's forward P/E multiple: Results of the regression of the respective multiple on realized $\Delta Conservatism$:

$$Multiple_{ijt+1} = \lambda_0 + \lambda_1 \Delta Conservatism_{it+1} + \Sigma \lambda_k Control_k + \omega' \quad (7)$$

Dependent variable is the market's multiple (column 1) and the analyst's multiple (column 2)

Variables	**Market's Multiple**	**Analyst's Multiple**	**Coefficient Difference**
	(1)	(2)	(3)
Δ***Conservatism***$_{it+1}$	**76.467**	**-2.836**	**79.303**
	(<0.001)	***(0.810)***	***(<0.001)***
Intangible Intensity	9.174	10.041	-0.867
	(<0.001)	*(<0.001)*	*(0.019)*
IB-Rank	0.208	-0.235	0.443
	(0.246)	*(0.206)*	*(0.002)*
Long-Term Growth	-6.191	-7.038	0.846
	(<0.001)	*(<0.001)*	*(<0.001)*
Book-to-Market	-6.516	-9.565	3.048
	(<0.001)	*(<0.001)*	*(0.008)*
Size	-0.340	0.008	-0.349
	(0.044)	*(0.962)*	*(0.205)*
Past Returns	1.363	1.947	-0.585
	(<0.001)	*(<0.001)*	*(0.212)*
Return Volatility	1.844	3.638	-1.794
	(<0.001)	*(<0.001)*	*(<0.001)*
ROA	-0.356	-0.490	0.134
	(<0.001)	*(<0.001)*	*(<0.001)*
Year Fixed Effects	Yes	Yes	
Industry Fixed Effects	Yes	Yes	
Adj-R^2	0.17	0.24	
N	95,058	95,058	

p-values in columns (1) and (2) relate to *t*-statistics that are corrected for clustering of standard errors by firm and are reported in parentheses below the related coefficient. Bold text indicates the variable of interest. Column (3) reports the difference in coefficients and the p-values of F-statistics of the difference obtained by jointly estimating the regressions in columns (1) and (2). The dependent variables are as follows: *Market's Multiple* in column (1) equals market price at date *t* divided by $FEPS_{ijt+1}$, and *Analyst's Multiple* in column (2) equals $TP_{ijt}/FEPS_{ijt+1}$. Other variables are defined in Appendix 2.

TABLE 6
Relation between target prices and year-ahead returns in the presence of conservative accounting

Panel A: Results of regression (10) of future returns on target prices and control variables:

$$R_{it+1} = \psi_0 + \psi_1 Q(TP/P)_{it} + \psi_2 Beta_{it} + \psi_3 Size_{it} + \psi_4 B/M_{it} + \psi_5 R_{it} + \psi_6 Accruals_{it} + \psi_7 NOA_{it} + \eta \qquad (10)$$

Dependent variable is future returns (R_{it+1})

	Quintiles of Δ*Conservatism*$_{it}$				
Variables	**Q5**	**Q4**	**Q3**	**Q2**	**Q1**
	(1)	(2)	(3)	(4)	(5)
Mean Δ*Conservatism*	0.0692	0.0084	0.0016	-0.0001	-0.0284
Intercept	0.241	0.288	0.322	0.338	0.162
	(0.114)	*(0.025)*	*(0.036)*	*(0.008)*	*(0.116)*
Q(TP/P)	**-0.157**	**-0.086**	**-0.040**	**-0.005**	**-0.070**
	(0.005)	***(0.125)***	***(0.552)***	***(0.911)***	***(0.125)***
Beta	-0.023	-0.057	-0.075	-0.051	0.002
	(0.414)	*(0.057)*	*(0.057)*	*(0.110)*	*(0.934)*
Size	0.005	-0.006	-0.015	-0.017	-0.004
	(0.700)	*(0.511)*	*(0.181)*	*(0.114)*	*(0.716)*
B/M	0.002	0.014	0.005	0.003	0.003
	(0.454)	*(0.024)*	*(0.285)*	*(0.222)*	*(0.095)*
Past Returns	-0.058	-0.031	-0.015	-0.012	-0.076
	(0.420)	*(0.650)*	*(0.844)*	*(0.869)*	*(0.232)*
Accruals	0.055	-0.107	-0.202	-0.120	-0.202
	(0.559)	*(0.390)*	*(0.204)*	*(0.585)*	*(0.306)*
NOA	-0.078	-0.096	-0.076	-0.117	-0.028
	(0.064)	*(0.009)*	*(0.035)*	*(0.003)*	*(0.366)*
Adj-R^2	0.014	0.018	0.024	0.017	0.012

Table 6 continued…

Panel B: Results of regression of future returns on high and low target price groups and control variables

Dependent variable is future returns (R_{it+1})

Variables	**Q5** (1)	**Q1** (2)
Intercept	0.162	0.137
	(0.191)	*(0.124)*
Low Q(TP/P)	**0.079**	**0.010**
	(0.004)	***(0.653)***
High Q(TP/P)	**-0.042**	**-0.044**
	(0.194)	***(0.102)***
Beta	-0.023	0.002
	(0.411)	*(0.936)*
Size	0.006	-0.004
	(0.622)	*(0.737)*
B/M	0.002	0.003
	(0.385)	*(0.084)*
Past Returns	-0.054	-0.075
	(0.446)	*(0.238)*
Accruals	0.061	-0.203
	(0.515)	*(0.304)*
NOA	-0.077	-0.027
	(0.067)	*(0.383)*
Adj-R^2	0.013	0.011

p-values relate to *t*-statistics that are corrected for clustering of standard errors by firm and year and are reported in parentheses. Bold text indicates the variables of interest. Target price quintiles are formed yearly based on the *I/B/E/S* mean consensus target price for a firm in the fourth month after the fiscal-year end, divided by price at the end of the fourth month. *Q*(*TP/P*) equals target price quintiles scaled such that they vary uniformly from zero to one. In panel B, *Low Q(TP/P)* includes firms in the lowest two target price quintiles, and *High Q(TP/P)* includes firms in the highest two target price quintiles. Columns (1) and (2) report regression results for Q5 and Q1, the top and bottom quintiles of $\Delta Conservatism_{it}$, respectively. All other variables are defined in Appendix 2.