Analysts' Valuation of Conservative Earnings in Estimating Target Prices

Jae B. Kim
University of Minnesota

Alexander Nekrasov
University of California, Irvine

Pervin Shroff*
University of Minnesota

Andreas Simon
California Polytechnic State University

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*University of Minnesota, Carlson School of Management, 321 19th Ave South, Minneapolis, MN 55455. shrof003@umn.edu, Tel. (612) 626-1570.

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Abstract

The paper examines whether financial analysts correctly undo the effect of accounting conservatism in their earnings forecasts in arriving at their target price forecasts. Based on prior findings, we consider alternative valuation models/heuristics that may be used by analysts to estimate target prices, e.g., the forward P/E and the PEG ratio. Our evidence suggests that analysts fail to fully undo the effect of accounting conservatism embedded in their forecasts of earnings and earnings growth when estimating their target price forecasts. More sophisticated analysts adjust for the effect of conservatism to a greater extent than other analysts, although their target price forecasts also exhibit conservatism bias. In contrast, the market on average appears to correctly unravel the conservatism in future earnings when pricing securities. However, for extreme levels of conservatism, our evidence suggests that the under/over-statement of target prices leads to distortions of market prices.

1. Introduction

Conservatism is viewed by many as a desirable attribute of accounting. It is often argued that conservatism enhances the efficiency of contracting with debt-holders and managers, and reduces expected shareholder litigation costs and the present value of tax payments (Watts and Zimmerman, 1986; Watts, 2003). Conservatively reported earnings are considered to be of high "quality" due to the higher verification standard for recognizing gains relative to losses. However, this emphasis on reliability may introduce some complexity when it comes to firm valuation. Accounting conservatism typically creates a downward bias in reported earnings and, when investment in assets is not in steady state, conservatively reported earnings may adversely affect the predictability of future sustainable earnings. If this consequence of conservatism is not appreciated by investors, it may well lead to distortions of the market price (Penman and Zhang, 2002). In this paper, we test whether accounting conservatism leads to the distortion of a relevant information input to the price formation process, namely target price forecasts issued by financial analysts. We then examine whether the conservatism-induced distortion of target prices leads to a distortion of market prices.

Specifically, we test whether analysts, who are relatively sophisticated market participants, understand the valuation implications of earnings forecasts that are determined using conservative accounting. We first hypothesize that analysts' earnings forecasts will reflect the effect of accounting conservatism, if their objective is to forecast *reported* core earnings. Given that accounting conservatism should not have a direct impact on the present value of expected payoffs, we next examine whether analysts undo the conservatism-induced portion of their earnings forecasts in arriving at their forecasts of target prices.

It is well-known that analysts forecast firms' core earnings which exclude non-recurring items. If core earnings are derived using conservative accounting, then we expect analysts' earnings forecasts to also reflect such conservatism since forecast accuracy is rewarded.[1] To assess the effect of conservatism

[1]Mikhail, Walther and Willis (1999) find that analysts are less likely to turn over when their forecast accuracy is higher relative to their peers.

on annual earnings, we estimate the difference in the beginning and ending balances of "hidden" reserves generated by conservative accounting. Similar to Penman and Zhang (2002), we estimate hidden reserves by summing 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. Thus, this measure captures the effect of "unconditional" (or news-independent) conservatism on the income statement, which equals the expenditure incurred during the year minus the hypothetical amortization of the asset. We estimate unbiased earnings as earnings that would have been reported if the firm had not used conservative accounting, i.e., we add back the earnings effect of conservatism (termed conservatism-bias, henceforth) to reported earnings.[2] We examine the relation between analysts' earnings forecasts and (realized) unbiased earnings and conservatism-bias for the forecast year. If analysts do not fully incorporate conservatism in their earnings forecasts, we expect them to place a lower weight on conservatism-bias relative to that on unbiased earnings when deriving their earnings forecasts. Equivalently, in such a case, we also expect conservatism-bias to be negatively correlated with analysts' signed earnings forecast errors. Note that our main purpose in this paper is to link the portion of conservatism-bias reflected in analysts' earnings forecasts with that reflected in their contemporaneous target price forecasts; hence, our analysis makes use of the components of *realized* earnings of the forecast year to assess the effect of conservatism on analysts' earnings and target price forecasts.[3]

On the one hand, analysts must make adjustments for the impact of accounting conservatism on their earnings forecasts, since their objective is to minimize forecast errors relative to reported (core) earnings. On the other hand, accounting conservatism does not directly affect firm value. Hence, we test

[2]The word "bias" is used here to describe the systematic deviation of conservative earnings from economic (or unbiased) earnings in the spirit of Feltham and Ohlson (1995).

[3]In other words, our purpose is not to examine whether analysts correctly and fully predict the effect of conservatism using variables that are observable at the time they make their forecasts. Other related studies have examined this issue. For example, Li (2009) finds that signed errors in analysts' *initial* earnings forecasts have a negative correlation with the firm's ex ante level of conservatism, suggesting that analysts do not fully incorporate accounting conservatism in their initial forecasts. Pae and Thornton (2010) document a subtle form of inefficiency in the last forecast before earnings announcements; they find that analysts do not fully understand that asymmetric timeliness will be higher (lower) if the beginning market-to-book ratio (proxy for balance-sheet reserves) is lower (higher).

whether analysts appropriately add back the conservatism-bias incorporated in their earnings forecasts when using these forecasts as inputs to their valuation model to derive target prices.

We assume that analysts estimate target prices by using an earnings-based formula. Bradshaw (2002) finds that target prices on average are based on valuation heuristics, such as the PEG ratio, rather than on more sophisticated models such as the residual income valuation model. We assess the impact of conservatism-bias in analysts' annual earnings forecasts on their 12-month-ahead target price forecasts, by estimating the regression of target price forecasts on analysts' inputs to alternative valuation formulas, namely analysts' one-year-ahead and two-year-ahead earnings forecasts, their long-term growth rate forecast, and the components of these forecasts. Specifically, we estimate the regression of target price on the conservatism-induced portion of the earnings forecast and the remaining (unbiased) earnings forecast. If analysts fully undo the effect of conservatism embedded in their earnings forecasts for the purpose of firm valuation, we expect an insignificant coefficient on the conservatism-induced portion of the earnings forecast. A negative and significant coefficient would imply that analysts do not fully add back the effect of conservatism in their earnings forecasts when deriving their target price forecasts. We include components of the appropriate forecasts as inputs to the valuation model/heuristic that analysts are assumed to use in formulating their target price forecasts.

Our results first show that analysts incorporate the effect of conservatism in their one-year- and two-year-ahead earnings forecasts, although the adjustment is not complete. Regardless of the valuation model/heuristic examined, we find that analysts do not fully undo the conservatism-bias in their forecasts of future earnings and earnings growth in arriving at their target price forecasts. This result is corroborated by the significant positive correlation between target price forecast errors and conservatism-bias in future earnings. In examining differences among analysts, we find that target prices of relatively sophisticated analysts have lower bias due to earnings conservatism compared to those of other analysts, although significant bias is still present.

In contrast to analysts' target prices, we find that on average market prices are unrelated with the conservatism-bias in future earnings. This on-average finding however does not rule out the possibility of

price distortions for some cases, given our finding that analysts' target price forecasts are understated on average due to the effect of accounting conservatism. This is especially a concern because prior research finds that analysts' target price forecast revisions have a significant price impact (Brav and Lehavy, 2003, and Asquith et al., 2005). Our analysis shows that firms with relatively low target prices and high (ex ante) conservatism-bias earn significantly positive future returns and firms with relatively high target prices and negative (ex ante) conservatism-bias earn significantly negative future returns. The effect on future returns is especially strong for firms with high (positive) conservatism-bias; for this group of firms, we find that the differential return in the subsequent year for the low versus high target price groups is around 14% after controlling for variables that are known to explain the cross-section of returns. The systematic subsequent return performance that we document suggests that the market may have undervalued (overvalued) firms, when analysts' target price forecasts are significantly underestimated (overestimated) due to the effect of accounting conservatism.

Our study contributes to the literature on the consequences of conservative accounting. Our evidence suggests that important market participants such as analysts, in achieving their goal of getting the earnings forecast right, make errors in firm valuation due to the effect of conservatism. The errors in target price forecasts may then be transmitted to investors and lead to pricing errors, especially for firms with high levels of conservatism-bias. Penman and Zhang (2002) show that the market fails to correctly adjust the effect of conservatism in estimating sustainable earnings, when there are temporary changes in investment growth. Our paper complements their finding by providing evidence on how analysts' target price estimates lead to distortions of the market price due to the effect of accounting conservatism.

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

Currently, most sell-side analysts produce three important outputs – earnings forecasts, target price

forecasts, and stock recommendations. All three outputs have been shown by research to have a significant impact on stock prices. The focus of our paper is to examine how analysts deal with the bias introduced in reported earnings by the use of conservative accounting in deriving two outputs of their analysis – earnings forecasts and target price forecasts.

In relation to earnings forecasts, Li (2009) finds that optimism in analysts' initial earnings forecasts is positively correlated with accounting conservatism based on several measures of ex ante unconditional conservatism. While her findings with regard to initial earnings forecasts suggest that analysts do not fully incorporate accounting conservatism at the outset, she finds that analysts do revise their subsequent forecasts downward to adjust for the conservatism-related news reflected in management guidance. Pae and Thornton (2010) examine the last forecast issued prior to the annual earnings announcement and focus on the effect of conditional (news-dependent) conservatism as measured by the asymmetric timeliness of losses versus gains estimated from the Basu regression. These authors observe asymmetric loss recognition in both reported earnings as well as analysts' earnings forecasts, but find less asymmetry in analysts' earnings forecasts relative to reported earnings. They further find that analysts' forecasts do not *fully* allow for the fact that earnings of firms with higher (lower) balance sheet reserves (proxied by the beginning market-to-book ratio) generated by prior conservative accounting are likely to exhibit less (more) asymmetric timeliness in the current year. Collectively, the evidence shows that analysts do adjust for accounting conservatism when forecasting earnings, but the adjustment is not complete.

It is well-established that stock recommendations are an important output of the analyst – research shows that stock prices react to upgrades and downgrades of stock recommendations (Womack, 1996). While it would be interesting to examine if analysts' stock recommendations reflect the bias introduced by conservatism in analysts' earnings forecasts, the discrete nature of stock recommendations (i.e., Buy, Hold, Sell, …) may inhibit our ability to detect the effect. We therefore examine the intermediate output of the analyst, target price forecasts, which analysts provide in support of their stock

recommendations. Target price forecasts, being more granular than stock recommendations, are likely to provide a more powerful test setting.

Prior research finds a significant market reaction to analysts' target price revisions; moreover, the information conveyed by target price revisions is found to be incremental to that of the contemporaneously issued stock recommendations and earnings forecast revisions (Brav and Lehavy, 2003, and Asquith et al., 2005). Although target prices convey information to the market, the evidence in Bradshaw and Brown (2006) shows that only 45% of analysts' 12-month-ahead price targets are attained at any time during the one-year forecast horizon. Further, they find no evidence of persistent differences among analysts in their ability to forecast target prices. Their results lead them to conclude that, since in general target price forecast accuracy is not explicitly tied to analysts' career concerns and compensation, analysts may not have strong incentives to issue accurate target price forecasts. Analysts may instead exploit this opportunity to provide ex post justification for their optimistic stock recommendations. Asquith et al. (2005) find that 54% of stocks with price target forecasts from the *Institutional Investor's* "All American" team analysts are attained over the one-year forecast horizon, overshooting the target by 37% on average; the remaining 46% of stocks fall short of the price target by about 16%. Overall, the empirical evidence suggests that analysts' target price forecasts do convey value-relevant information to the market, although their average investment performance appears to be unimpressive.

Since earnings forecasts are a critical input for estimating price targets regardless of the valuation approach used, accurate earnings forecasts should lead to high quality target price forecasts. Contrary to this expectation, Bradshaw and Brown (2006) show that superior earnings forecasting ability does not translate to superior forecasts of target prices. If accurate earnings forecasts incorporate conservatism-bias, and if analysts do not adjust for the effect of this bias, it could well result in inaccurate target price forecasts relative to the actual price. This argument of course assumes that the market price correctly adjusts for the conservatism-induced bias in earnings. However, Penman and Zhang (2002) find that investors fail to recognize that conservative accounting leads to temporary changes in earnings when there is a temporary change in investment growth. Thus, they conclude that conservative accounting coupled

with temporary changes in investment growth may lead to pricing errors. In our main analysis, therefore, we do not use the actual price as a benchmark to test whether target prices adjust for the conservatism-induced bias in analysts' earnings forecasts. Instead, we directly examine how the conservatism-bias component of an analyst's earnings forecast maps into the same analyst's target price forecast.

Asquith et al. (2005) find that 99% of analysts' reports in their sample mention that they use some variation of an earnings multiple, such as the price-to-earnings ratio, while only 13% report using some variation of the discounted cash flow model in estimating their price targets. Bradshaw (2004) finds that pseudo-price targets based on PEG ratios have a higher correlation with analysts' actual price targets than pseudo-price targets based on industry P/E ratios. Gleason, Johnson and Li (2008) find superior target-price investment performance when analysts appear to be using more rigorous valuation techniques (such as the residual income model) rather than simple heuristics.

We make alternative assumptions for the earnings-based valuation formula used by analysts and test whether the analyst's target price forecast adjusts for the conservatism-bias incorporated in the same analyst's contemporaneously issued earnings forecasts. We hypothesize that, since analysts are known to convert their earnings forecasts to target prices based on valuation heuristics, target price forecasts will not fully adjust for the conservatism-bias in analysts' earnings forecasts. In the next section, we explain the research design using alternative valuation heuristics and models that analysts may use to derive their target price forecasts.

3. Data and Research Design

3.1 Data and sample selection

We obtain analysts' earnings forecasts and target price data from the I/B/E/S database for all non-financial U.S. firms over the years 1999 through 2007.[4] We initially identify 384,881 12-month target

[4]Previous studies generally obtain analysts' target price data from the First Call database, e.g., Bradshaw and Brown (2006) and Gleason et al. (2008). Since April 2009, the I/B/E/S database provides analysts' target prices in addition to earning forecasts from the year 1999 onward. Our use of I/B/E/S data avoids problems encountered by prior studies in combining data at the brokerage-firm level from First Call with analyst-level data from I/B/E/S.

price forecasts issued by 7,065 analysts who are affiliated with 539 distinct brokerage and stock research companies. We limit our sample to 12-month-ahead target price forecasts issued by analysts within a period of three months following the previous-year's earnings announcement. Similar to previous studies, for each target price, we identify one-year and two-year-ahead earnings forecasts that are issued by the same analyst within a period of 30 days prior to the release of the target price forecast.[5] This ensures that we use the specific earnings forecasts that are likely to be used by the analyst as inputs to his/her valuation model. These data requirements produce a preliminary sample of 71,467 analyst-firm-year observations.

We impose several additional requirements to obtain the final sample. Following Bradshaw and Brown (2006), we require the closing share price three days prior to the target price forecast date to exceed $1 to mitigate the effect of thinly traded stocks. Further, we require the actual stock price at the end of the twelfth month following the target price forecast date to calculate forecast errors. Similarly, we require realized earnings of subsequent years to assess the accuracy of annual earnings forecasts.[6] We obtain the stock price and returns data from CRSP, actual (i.e., realized) EPS and dividends per share from I/B/E/S, and variables used to measure conservatism from Compustat. In case of multiple target price forecasts issued by the same analyst for a particular firm-year, we only retain the first target price forecast issued within the three-month window after the previous-year's earnings announcement. After imposing these data restrictions, we obtain a final sample of 10,695 analyst-firm-year target price forecasts and associated earnings forecasts. These forecasts are issued by 2,328 individual analysts affiliated with 268 distinct brokerage companies and covering 809 distinct firms over the years 1999 through 2007. The mean (median) number of analyst target price forecasts included in our sample for a firm-year is 3.94 (3.0). The sample exhibits a concentration of firms in pharmaceutical products (6.9%), computers (7.6%), electronic equipment (11.8%), business services (15.9%), and retail (22.2%)

[5]We retain the most recent forecast when multiple EPS forecasts are issued during the 30-day period.

[6]Our tests of future returns do not require ex post data and hence are not subject to either survivor or look-ahead bias.

industries.

To estimate the three-year-ahead earnings forecast, we apply the (3-5 years) long-term growth rate to the two-year-ahead forecast; we require a positive two-year-ahead forecast because growth from a negative base is not meaningful. When estimating variations of the PEG valuation model, the limited availability of long-term growth forecasts reduces the sample size to 3,814 analyst-firm-year observations.

3.2 Measure of conservatism-bias

We estimate the effect of (unconditional) conservatism on the income statement by taking the difference between the beginning and ending balances of "hidden" reserves on the balance sheet. Similar to Penman and Zhang (2002), we estimate hidden reserves to capture the effect of conservative accounting treatment of specific assets. Thus, hidden reserves equal the sum of inventory reserve, R&D reserve, and advertizing reserve. Inventory reserve equals the LIFO reserve reported in the inventory footnote in the company's annual financial statements. 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 had been capitalized and not expensed as incurred. We follow Amir, Lev, and Sougiannis (2003) for the specific calculation of the R&D reserve. We (hypothetically) capitalize R&D expenditure incurred during the year and amortize the asset at a uniform straight-line amortization rate of 20%, assuming that R&D expenditure is incurred evenly during the year. Thus, R&D reserve (*R&DRES*) equals:

$$R\&DRES_t = 0.9\times R\&D_t + 0.7\times R\&D_{t-1} + 0.5\times R\&D_{t-2} + 0.3\times R\&D_{t-3} + 0.1\times R\&D_{t-4}$$

where $R\&D_t$ is the R&D expenditure for year t.[7] *ADVRES* is the estimated asset that would be reported on the balance sheet if advertising expenditures (assumed to be incurred at the end of the year) were capitalized and amortized using the sum-of-the-years' digits amortization schedule with a 2-year useful

[7]As discussed by Amir, Lev and Sougiannis (2003), this amortization schedule approximates the industry average amortization schedule estimated in Lev and Sougiannis (1996).

life. Thus, advertising reserve (*ADVRES*) equals:

$$ADVRES_t = ADV_t + 0.3 \times ADV_{t-1}$$

where ADV_t is the advertising expense for year t. We use sum-of-the-years' digits amortization because typically advertising has a useful life of one to two years and provides more benefits when it is initiated (Penman and Zhang, 2002).[8]

3.3 Effect of conservatism on earnings forecasts

We examine whether analysts incorporate the effect of accounting conservatism in their one-year- and two-year-ahead earnings forecasts. We first estimate "unbiased" realized earnings by taking the realized reported earnings and adding back the income-statement effect of conservatism (i.e., conservatism-bias) measured by the difference between the beginning and ending balances of hidden reserves on the balance sheet, as explained in Section 3.2. Then, we estimate a cross-sectional time-series regression of the analyst's annual earnings forecast on the firm's unbiased realized earnings and conservatism-bias for the corresponding forecast period. We estimate separate regressions with one-year-ahead or two-year-ahead earnings forecasts as the dependent variable.

$$FEPS_{ijt+\tau} = \alpha_0 + \alpha_1 UEPS_{it+\tau} + \alpha_2 Conserv\text{-}bias_{it+\tau} + \varepsilon_{ijt+\tau} \quad (1)$$

where $FEPS_{ijt+\tau}$ equals the forecasted EPS of firm i issued by analyst j at date t, for year $t+\tau$ (τ = 1, 2), $UEPS_{it+\tau}$ equals unbiased realized EPS of firm i for year $t+\tau$, and $Conserv\text{-}bias_{it+\tau}$ equals the conservatism-bias in realized earnings of firm i for year $t+\tau$. The regression is estimated using analyst-firm-year observations. All variables are scaled by the closing price three days prior to the forecast date. Since we measure conservatism-bias as the change in hidden reserves, an increase in hidden reserves during the year will have a negative effect on earnings. We expect the coefficient on conservatism-bias, α_2, to be negative and significant, if analysts incorporate the effect of conservatism into their earnings forecasts. Assuming that analysts have equal predictive ability with respect to unbiased earnings and

[8]When the data item for LIFO reserve, R&D, and ADV in Compustat is coded as missing because the amount is insignificant, we equate these variables to zero.

conservatism-bias, we expect $\alpha_1 = |\alpha_2|$ if analysts fully incorporate conservatism-bias in their earnings forecasts, and $\alpha_1 > |\alpha_2|$, if the effect of conservatism on earnings is only partially accounted for by analysts. Note that this is an ex post analysis, in that we are determining ex post how much of the actual conservatism bias was incorporated by analysts in their earnings forecasts. This ex post design allows us to examine whether the conservatism-bias that is incorporated in the analyst's earnings forecast is unraveled (fully or partially) when the analyst uses the earnings forecast as an input to estimate the target price. We estimate the conservatism-bias component of the forecast, *FConserv-bias* = - ($\hat{\alpha}_2$ x *Conserv-bias*), and the unbiased EPS forecast, *UFEPS* = (*FEPS* - *FConserv-bias*), and use these two components of the earnings forecast in the second-stage regression to explain target price forecasts.[9] Since conservatism-bias is measured at the firm-year level, our test focuses on how the *average* level of conservatism incorporated in all analysts' earnings forecasts for a firm-year is reflected in their target price forecasts.

3.4 Effect of conservatism on target prices

We consider alternative earnings-based valuation models/heuristics that may be used by analysts to formulate their target price forecasts.

3.4.1 Forward P/E

First, we use a 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 an earnings multiple to derive target prices. We assume that price (*P*) is estimated as a multiple of the one-year-ahead or two-year-ahead EPS forecast of the analyst, i.e., $P_0 = \varphi FEPS1$ or $P_0 = \varphi FEPS2$ (where φ is the forward P/E multiple). If analysts use this simple earnings capitalization model to estimate the target price, the forward earnings that are capitalized must be unbiased earnings that do not include any conservatism bias.

[9]Given that α_2 is expected to be negative, we multiply ($\hat{\alpha}_2$ x *Conserv-bias*) by -1 so that a higher value of *FConserv-bias* denotes a higher level of conservatism bias.

To examine the analysts' conversion of their EPS forecasts into their target price forecasts, we estimate a cross-sectional time-series regression of the forecasted date-*t* target price (TP_t) on the unbiased EPS forecast for the year $t+\tau$ (τ = 1, 2), $UFEPS_{t+\tau}$, and the conservatism-bias component of the $t+\tau$ earnings forecast, $FConserv\text{-}bias_{t+\tau}$. Note that at date *t-1* the analyst forecasts the target price at date *t* (i.e., the 12-month target price). Thus, we use earnings forecasts issued at date *t-1* for the year *t+1* or *t+2* after the target price date *t* as inputs to the analyst's valuation model.[10] Specifically, we estimate the following regression:

$$TP_t = \beta_0 + \beta_1 UFEPS_{t+\tau} + \beta_2 FConserv\text{-}bias_{t+\tau} + v_t \quad (2)$$

where τ = 1, 2.[11] All variables are scaled by the closing price three days prior to the target price forecast date. We expect a positive and significant β_1 if forward earnings are used as an input to estimate the target price. If analysts add back the conservatism bias and value $UFEPS_{t+\tau}$ rather than $FEPS_{t+\tau}$, then β_2 should be insignificant. On the other hand, if the conservatism bias in forward earnings is only partially adjusted when estimating the target price, we expect β_2 to be negative and significant.

3.4.2 PEG ratio

Bradshaw (2004) finds that analysts' stock recommendations are more correlated with heuristics such as the price-earnings-to-growth (PEG) ratio rather than with present-value models such as the residual income valuation model. Analysts' long-term growth rate may adjust for the fact that if current earnings are lower due to conservatism, then future earnings may be correspondingly higher (if the firm's asset growth is in a steady or declining state). Consistent with this argument, we find that, in our sample, analysts' long-term growth rate is positively correlated with the conservatism-bias in earnings of years *t+1* and *t+2* (untabulated). Hence, it is possible that, if analysts use a valuation formula that incorporates forecasted long-term growth (such as the PEG ratio), the effect of conservatism in one-year- and two-year-ahead earnings forecasts may be offset by the higher forecasted earnings growth rate. Thus, if

[10]Note that earnings of year *t+1* or *t+2* are forward earnings in relation to the target price at date *t*.

[11]Firm and analyst subscripts are dropped in the interest of brevity.

analysts use a PEG-type valuation model rather than the forward P/E formula, it is likely that the conservatism-bias gets automatically adjusted in arriving at target prices. We use a simplification of the abnormal earnings growth model (OJ model) developed by Ohlson and Juettner-Nauroth (2003). The OJ model is expressed as

$$P_t = FEPS_{t+1} / r + AGR_{t+2} / r(r - \gamma) \tag{3}$$

where $AGR_{t+2} = FEPS_{t+2} + rFDPS_{t+1} - (1+r)FEPS_{t+1}$ equals the abnormal earnings growth measured as expected cum-dividend earnings of year *t+2* minus normal earnings that would be expected given earnings of year *t+1*, *r* equals the expected rate of return, $FDPS_{t+1}$ equals forecasted dividends per share (*DPS*) for year *t+1*, and γ equals the perpetual growth rate in *AGR* beyond the forecast horizon.

Following Easton and Monahan (2005), we use modifications of the PEG model in equation (3) as the formula used by analysts in arriving at their target price forecasts. First, we assume that zero dividends are expected to be paid in year *t+1* and that γ equals zero. Thus,

$$P_t = (FEPS_{t+2} - FEPS_{t+1}) / r^2 \tag{4}$$

To test if analysts add back the effect of conservatism in their earnings forecasts to determine the target price, we estimate the following regression:

$$TP_t = \beta_0 + \beta_1(UFEPS_{t+2} - UFEPS_{t+1}) + \beta_2(FConserv\text{-}bias_{t+2} - FConserv\text{-}bias_{t+1}) + v_t \tag{5}$$

We expect β_1 to be positive and significant, and β_2, the coefficient on the conservatism-bias component, to be insignificant, if analysts fully adjust for the effect of conservatism in their earnings forecasts when valuing the firm. On the other hand, if the conservatism bias in forecasted future earnings is only partially adjusted when estimating the target price, we expect β_2 to be significantly negative.

Second, we directly estimate the target price regression based on equation (3) by first estimating the abnormal growth rate, AGR_{t+2}, using (i) forecasted EPS, (ii) forecasted *DPS* for year *t+1* based on a constant payout ratio that equals the actual payout ratio in year *t-1*, and (ii) an assumed expected rate of return, *r*. We then split up AGR_{t+2} into its unbiased and conservatism-bias components, where $UAGR_{t+2} = UFEPS_{t+2} + rFDPS_{t+1} - (1+r)UFEPS_{t+1}$, and $AGRConserv\text{-}bias_{t+2} = AGR_{t+2} - UAGR_{t+2}$.

We use alternative estimates of r, including a constant r = 10%, and an industry-specific r using the Fama-French three-factor model (based on the Fama-French 48 industry classification). We estimate the following regression based on equation (3):

$$TP_t = \beta_0 + \beta_1 UFEPS_{t+1} + \beta_2 FConserv\text{-}bias_{t+1} + \beta_3 UAGR_{t+2} + \beta_4 AGRConserv\text{-}bias_{t+2} + v_t \quad (6)$$

We expect β_1 and β_3 to be positive and significant. β_2 and β_4 are expected to be insignificant, if analysts fully adjust for the effect of conservatism in their earnings forecasts when valuing the firm. If analysts only partially adjust the conservatism bias in forecasted future earnings when arriving at the target price, we expect β_2 and β_4 to be significantly negative. Since PEG-based models incorporate abnormal future earnings growth in arriving at target prices, it is more likely that the coefficients on conservatism bias will be insignificant if the growth rate accounts for the fact that the earnings effect of conservatism will reverse in future years.

4. Empirical Results

Table 1 presents descriptive statistics for our sample firms over the period 1999-2007. All variables (except the long-term growth rate forecast) are scaled by the closing price three days prior to the target price issuance date. Consistent with prior research, analyst optimism is evident in the one-year- and two-year-ahead EPS forecasts as indicated by the negative mean forecast errors (actual minus forecast). 12-month target prices exceed the stock price just prior to forecast issuance by 22% on average. Yearly means (untabulated) show a declining trend in the target price to current price ratio (*TP/P*) from the year 2001 onward; the decline is substantial from 2001-2004 and marginal thereafter.[12] Further, as evident from the target price forecast error, target prices on average overshoot the 12-month ahead realized price by about 14%, indicating that target prices are optimistic on average (consistent with Bradshaw and

[12]The mean *TP/P* of our sample (1999-2007) is lower than that reported by prior studies – 22% versus 32% in Gleason et al. (2008) over 1997-2003, and 35% in Bradshaw and Brown (2006) over 1997-2002. The mean *TP/P* of our sample is similar to that reported by these two studies for the years that overlap with their sample periods. The difference in overall means is due to the continuation of the declining trend in *TP/P* after 2003. The decline in *TP/P* after 2003 may perhaps result from a change in analysts' behavior due to the disclosure requirements imposed by stock exchanges on analysts' reports as a consequence of the Global settlement.

Brown, 2006). The mean long-term growth rate forecast is 18.7% for our sample. While the mean actual EPS is 4.1% of price, the mean unbiased EPS is higher at 4.9% and the mean conservatism bias is 0.8%. Thus, the reported EPS of our sample is understated by about 16% on average due to the effect of accounting conservatism (in recording R&D, advertising and inventory).

4.1 Effect of conservatism on earnings forecasts

Table 2, Panel A, presents results of the regressions of analysts' one-year- or two-year- ahead EPS forecasts on the two components of the actual reported EPS of the year for which the forecast is made – i.e., unbiased EPS and conservatism bias (regression 1). The regressions are estimated with year and industry (Fama-French 48 industries) fixed effects and the *t*-statistics are corrected for clustering of standard errors by firm. The dependent and independent variables are winsorized at the extreme 1% of their distributions to mitigate the influence of outliers. For both forecasting horizons, the coefficient estimate on actual unbiased EPS is positive and significant as expected. If analysts consider the effect of conservatism in forecasting EPS (to obtain accurate forecasts of reported EPS which is conservatively derived), we expect the coefficient estimate on conservatism bias to be negative and significant. Our results are consistent with this expectation. In relation to the one-year-ahead forecast (column 1), the coefficient estimate on conservatism bias is slightly smaller than that on unbiased EPS, suggesting that analysts only partially adjust the effect of conservatism – however, the difference between the absolute value of the coefficient estimates is insignificant. The results in column (2) suggest a slight (but statistically insignificant) over-adjustment for the effect of conservatism in analysts' two-year-ahead forecasts. As evident from the lower R^2, analysts' ability to forecast earnings declines as the forecast year gets further from the forecast date.

Consistent with prior research (e.g., Li, 2008), we also estimate a regression of the signed earnings forecast error (actual minus forecast) on the actual conservatism-bias to examine the extent to which analysts incorporate the effect of conservatism into their earnings forecasts. If analysts do not fully incorporate (or cannot accurately predict) the effect of conservatism in their earnings forecasts, the

coefficient on conservatism-bias should be negative and significant. From Panel B, column (1), we find that the coefficient estimate on conservatism-bias is negative and weakly significant suggesting that analysts do not fully adjust the effect of conservatism in their one-year-ahead forecasts. Column (2) shows an insignificant effect of conservatism bias on analysts' two-year-ahead forecast errors.

Overall, our results suggest that analysts do incorporate the effect of conservative accounting in their earnings forecasts. In the next sub-section, we examine the extent to which analysts add back the conservatism bias incorporated in their earnings forecasts when deriving their target price forecasts.

4.2 Effect of conservatism on target price forecasts

Table 3 reports results of the regression of target prices on the unbiased EPS forecast and the forecasted conservatism-bias based on alternative valuation models and heuristics.

4.2.1 Forward P/E

In Panel A of Table 3, we report results of regression (2) assuming that analysts derive their target price forecasts based on the forward P/E multiple using the EPS forecast of year *t+1* (column 1) or year *t+2* (column 2). If analysts correctly add back the effect of conservatism in their EPS forecasts, then the valuation should be based entirely on the unbiased EPS forecast and the coefficient on forecasted conservatism-bias should be insignificant.[13] From the estimation of regression (2), we find that, while the unbiased forecasted EPS is positively related to the target price as expected, the coefficient estimate on *FConserv-bias* is in fact negative and significant.[14] This implies that, rather than using the unbiased EPS forecast, analysts include the effect of conservatism in their earnings forecasts to obtain the target price forecasts.

[13]Note that the forecasted conservatism-bias (obtained from the first-stage regression 1) differs from the actual conservatism-bias only by a scale factor; we use the forecasted conservatism-bias as the independent variable in order to have comparable coefficient estimates to facilitate interpretation.

[14]The coefficient estimate on unbiased EPS differs from the average forward P/E ratio due to the inclusion of the year and industry fixed effects. When we exclude all fixed effects as well as the intercept, the coefficient estimate is around 17 – roughly the average P/E.

4.2.2 Relative P/E

If analysts use a relative P/E multiple to estimate target prices, say the industry P/E multiple, then the effect of conservatism-bias in their EPS forecasts can potentially be canceled out by the industry-specific conservatism-bias in the denominator of the industry P/E. To the extent, the firm's conservatism-bias differs from the average level of industry conservatism-bias, the unraveling of conservatism in earnings forecasts in arriving at the target price estimate will not be complete. Assuming that analysts use the relative industry P/E to derive target prices, we estimate regression (2) by industry to test whether analysts adjust the within-industry differences in firm-level conservatism-bias in arriving at their target prices. Columns (3) and (4) of Panel A report the mean coefficient estimates and *t*-statistics estimated across industries (similar to Fama-MacBeth).[15] The mean coefficient estimates on *FConserv-bias* are negative and significant for regressions based on forward EPS of year *t+1* as well as year *t+2*. Thus, even if analysts base their target price forecasts on industry rather than firm-level P/E, our results indicate that firm-level conservatism-bias in their EPS forecasts influences their target price forecasts.

4.2.3 PEG Ratio

Table 3, Panel B, reports results assuming that analysts use the PEG ratio model to arrive at their target price forecasts. Column (1) presents results of regression (5) based on the simplified OJ model which assumes zero dividends and $\gamma = 0$. The estimated coefficient on the change in unbiased forecasted EPS_{t+2} is positive and significant as expected. Similar to the P/E model, the coefficient estimate on the change in $FConserv\text{-}bias_{t+2}$ is negative and significant, indicating that the target price forecast is not based on unbiased earnings and earnings growth but includes the effect of conservative accounting. In columns (2) and (3), we report results of the less restrictive valuation formula captured by regression (6) with an assumed dividend payout and an assumed expected rate of return, *r* (used to obtain abnormal

[15]We form industry-groups based on the Fama-French 48-industry classification (Fama and French, 1997). Our requirement of at least 30 analyst-firm observations per industry reduces the number of observations to 10,249 representing 24 industries (in column 3); the additional requirement of long-term growth forecasts reduces the sample size to 3,130 observations representing 14 industries (in column 4).

earnings growth, AGR_{t+2}). Results in column (2), with a constant r=10%, and in column (3), with the Fama-French industry-specific r (mean = 10.9%), show that the estimated coefficients on unbiased forecasted EPS_{t+1} and unbiased AGR_{t+2} are both positive and significant. Similar to our previous results, we find that the coefficient estimate on $FConserv\text{-}bias_{t+1}$ and $AGRConserv\text{-}bias_{t+2}$ are both negative and significant.

Overall, our results indicate that, regardless of the valuation model or heuristic used, analysts do not fully undo the effect of conservatism in their earnings forecasts when arriving at their forecasts of target prices. Next, we investigate whether the future earnings effect of conservatism is correctly adjusted by the market when deriving the actual stock price.

4.3 Effect of conservatism on actual stock prices

Table 4 presents results of the regression of 12-month-ahead actual stock price (*P12*) and (i) actual unbiased EPS_{t+1} and $Conserv\text{-}bias_{t+1}$ in column (1) and (ii) actual unbiased EPS_{t+2} and $Conserv\text{-}bias_{t+2}$ in column (2) as independent variables. Again note that this is an ex post analysis in which we test the relative extent of subsequent realized earnings and conservatism-bias incorporated in the current stock price. The regression is estimated at the firm-year level by randomly selecting only one analyst following the firm in a given year. If the market correctly adjusts the effect of conservative accounting on expected future earnings in valuing the stock, we should observe an insignificant coefficient on *Conserv-bias*. Unlike the results for target price forecasts reported in Table 3, we find that the coefficient estimates on *Conserv-bias* of the subsequent one and two years are both insignificant. Thus, conservatism bias in earnings does not appear to distort market prices on average. Given this result, we corroborate our findings in Table 3 by examining the relation between conservatism-bias and target price forecast *errors* in the next sub-section.

4.4 Conservatism-bias and target price forecast errors

Table 5, Panel A, presents results of the regression of target price forecast errors on conservatism

bias in EPS of years *t+1* and *t+2* relative to the target price forecast date *t-1*. Similar to Bradshaw and Brown (2006), we measure target price forecast error as one plus the ex-dividend return over the 12-month forecast horizon minus *TP/P* (i.e., the target price divided by price three days prior to the target price issuance date).[16] We find that the target price forecast error is positively correlated with the conservatism-bias of year *t+1*, year *t+2*, and the bias measure summed over the two years. This suggests that analysts on average do not fully undo the conservatism bias when estimating target prices.

While thus far we have presented results for the average analyst, in the analysis that follows, we examine whether sophisticated analysts are better at unraveling the conservatism-bias from their target price forecasts. We use four 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, (ii) firm-specific experience measured by the number of years an analyst follows a firm from 1985 onward, (iii) general experience measured by the number of years an analyst appears in the I/B/E/S database from 1985 onward, and (iv) whether the analyst is named as an "All American" team analyst by the *Institutional Investor*. For the first three measures, the highest tercile of analysts ranked each year by the related variable is considered to be the high sophistication group. We estimate a regression of target price forecast errors on conservatism-bias in EPS of years *t+1* and *t+2* (as in Table 5, Panel A) including the interaction of conservatism-bias with the indicator variable for analyst sophistication.

From Panel B, we find that target prices of analysts in large brokerage firms and with higher firm-specific experience have lower bias due to earnings conservatism of year *t+1* relative to other analysts. This is indicated by the negative and (weakly) significant coefficient estimates on the interaction terms in columns (1) and (3). While analysts with higher firm-specific experience also appear to undo conservatism-bias from their longer-term (year *t+2*) earnings forecasts, the same is not observed for analysts from large brokerage firms. From Panel C, we find that analysts with higher general experience and "All American" team analysts do not treat conservatism-bias any differently from other analysts in

[16]An alternative measure used by Bradshaw and Brown (2006), where the target price forecast error equals 12-month-ahead actual price minus the target price, (*P12* - *TP*), divided by price three days prior to the target price issuance date, yields substantially similar results (unreported).

arriving at their target price forecasts. The insignificant results could be because (i) general experience as a proxy for analyst sophistication may not be as effective as firm-specific experience, and (ii) "All American" team analysts form only 9.2% of our sample, which may reduce the power of the test. An interesting result from Panels B and C relates to the estimate of the main effect of analyst sophistication on target prices. It appears that, while overall analysts are over-optimistic in making their target price forecasts, as indicated by the significantly negative intercepts, more sophisticated analysts (proxied by experience and "All American" status) are less so. Further, we do not observe this difference in optimism in the case of analysts belonging to large brokerage firms, confirming the incentive-driven optimism of these analysts. Overall, it appears that more sophisticated analysts adjust more of the conservatism-bias relative to other analysts when arriving at their target price forecasts, although the adjustment is far from complete.

Collectively, our evidence in Tables 3 and 5 indicates that on average analysts fail to fully undo the conservatism-bias in their earnings forecasts when arriving at their target price forecasts. In contrast, our results in Section 4.3 suggest that, on average, the market correctly disregards the conservatism bias in earnings when valuing a firm. It may be interesting to examine if distortions of stock price occur in some cases, especially for firms where the magnitude of conservatism-bias is large. In the next section, we examine whether the market understands that analysts may underestimate target prices if they fail to undo the effect of conservatism on their earnings forecasts.

4.5 Market pricing of target prices in the presence of conservative accounting

If analysts underestimate target prices due to the effect of conservative accounting, it is possible that investors when reacting to target price revisions may be misled into undervaluing the stock. If such misvaluation occurs, we would expect to see reversals of returns in subsequent periods when the information is revealed to investors. We estimate the cross-sectional time-series regression of future returns on target prices and control variables that are known to explain the cross-section of returns:

$$R_{t+1} = \psi_0 + \psi_1 Q(TP/P)_t + \psi_2 \beta_t + \psi_3 Size_t + \psi_4 B/M_t + \psi_5 R_t + \eta_{t+1} \quad (7)$$

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, 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_{t+1} equals security returns of a firm over the year $t+1$, i.e., over a period of twelve months beginning at the end of the fourth month after the fiscal-year end. The control variables include the CAPM beta, size (log of market value), and book-to-market ratio at the end of the previous fiscal-year, and price momentum measured as returns over a period of twelve months ending in the fourth month after the fiscal-year end. Note that regression (7) is not a factor model but simply examines the association between the target-price to price ratio 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 (ex ante) conservatism-bias in the previous year's earnings, divided by price at the end of the fourth month after the fiscal-year end, and estimate regression (7) for each quintile of conservatism-bias. *T*-statistics are corrected for clustering of standard errors by firm and by year (Petersen, 2009).

Table 6 presents results of regression (7) estimated for each conservatism-bias quintile. From Panel A, column (1), the coefficient estimate on $Q(TP/P)$ for the highest quintile of conservatism-bias is negative and significant, indicating that TP/P is negatively correlated with future returns. The magnitude of the coefficient estimate reflects that the differential future return between quintile 5 and quintile 1 of (TP/P) is around -14%. From columns (2) to (5), the coefficient estimate on $Q(TP/P)$ monotonically decreases from the highest conservatism-bias quintile 5 up to quintile 2 and is insignificant for quintiles 2 and 3. This is consistent with the very small magnitude of mean conservatism-bias for these two groups (reported in row 1). The coefficient estimate on $Q(TP/P)$ increases again for quintile 1, the lowest conservatism-bias quintile, and is weakly significant. Note from row (1) that the mean conservatism-bias for quintile 1 is negative.

Panel B of Table 6 shows results of regression (7) with separate coefficients estimated for the low (TP/P) group, which includes the lowest two (TP/P) quintiles, and the high (TP/P) group, which includes

the highest two (*TP/P*) quintiles (the intercept captures the effect for quintile 3). From column (1), when the conservatism bias is large, it is clear that the significant negative correlation between (*TP/P*) and future returns (reported in Panel A) is mainly contributed by the positive and significant future returns earned by the low (*TP/P*) group. Thus, it appears that the underestimation of target prices due to the effect of conservatism reflected in a significantly low (*TP/P*) may not be clear to the market. On the other hand, from column (2), when conservatism bias is negative, the negative correlation between (*TP/P*) and future returns is mainly attributed to the negative future returns earned by the high (*TP/P*) group. In this case, the negative conservatism bias leads to an overestimation of the target price, and thus negative future returns for the highest (*TP/P*) group (although statistically insignificant). Overall, our results indicate that the under-/over-estimation of target prices due to the effect of extreme conservatism is followed by future returns in the predicted direction suggesting that market prices may be distorted.

5. Concluding Remarks

This paper examines whether analysts, when using their earnings forecasts as inputs to obtain their target price forecasts, undo the conservatism-bias in their earnings forecasts. Our results show that, regardless of the valuation model/heuristic used, analysts on average fail to fully add back the conservatism-bias in their earnings forecasts when estimating target prices. More sophisticated analysts adjust the conservatism-bias in their earnings forecast to a greater extent relative to other analysts, although their target price estimates are also biased. While on average the market appears to correctly adjust for the effect of accounting conservatism when pricing firm earnings, we find evidence of some distortion of the market price for firms with extreme (ex ante) conservatism-bias. We find that firms with relatively low target prices and a high level of conservatism-bias earn positive future returns, whereas firms with high target prices and high negative conservatism-bias earn negative future returns. Thus, it appears that, for extreme levels of conservatism-bias, the market does not fully understand that analysts' target prices may be under/over-stated due to the conservatism-bias in their earnings forecasts.

Consistent with prior research, we find that target prices are over-optimistic on average. Yet, a significant number of target prices are relatively understated due to the effect of conservatism-bias in earnings forecasts. It appears then that target prices on average would have been even more optimistic if analysts had correctly adjusted the conservatism-bias in their earnings forecasts. It is interesting to note, from our results, that when target prices are relatively high and conservatism-bias is high, we do not observe significant future returns perhaps because the effect of conservatism-bias cancels out the effect of analyst optimism. Thus, distortions of the market price due to over-optimistic target prices seem to be alleviated by the failure of analysts to fully adjust the conservatism-bias in their earnings forecasts.

Both prior and our results indicate that, while analysts are relatively accurate in forecasting earnings, their target price forecasts are less accurate. Ironically, a source of their target price inaccuracy is due to their accurate forecasting of conservative earnings. If analysts were to use a full-blown DCF model or a residual income valuation model with appropriate adjustment to horizon earnings growth to account for prior conservatism in accounting, we would not observe the systematic over-/under-statement of target prices. Our evidence then highlights the limitations of using heuristics such as forward P/E and PEG ratios to estimate target prices without considering the sustainability of earnings used as inputs to these models, especially in the presence of conservative accounting. Our evidence also implies that emphasizing the accuracy of one valuation input (i.e., earnings) in analysts' reward functions rather than the accuracy of their end-products (target prices or stock recommendations) may be counter-productive.

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Table 1
Descriptive statistics of sample firms over the period 1999-2007

Variables	N	Mean	Median	SD
Analysts' Forecasts:				
One-year-ahead EPS	10,695	0.0472	0.0465	0.0267
Two-year-ahead EPS	10,695	0.0594	0.0567	0.0267
12-month Target Price	10,695	1.2170	1.1858	0.2608
%Long-Term EPS Growth	3,814	0.1868	0.1700	0.0886
Analysts' Forecast Errors:				
One-year-ahead EPS	10,695	-0.0038	0.0004	0.0231
Two-year-ahead EPS	10,695	-0.0135	-0.0042	0.0421
12-month Target Price	10,695	-0.1443	-0.1562	0.4901
Actuals (firm-years):				
Reported EPS	2,716	0.0411	0.0450	0.0459
Unbiased EPS	2,716	0.0489	0.0517	0.0476
Conservatism-bias	2,716	0.0077	0.0049	0.0172

Our sample includes 12-month target price forecasts issued by analysts within a period of three months following the previous year's earnings announcement. One-year and two-year-ahead EPS forecasts include forecasts issued by the same analyst within a period of 30 days preceding the release of the target price forecast. Target prices, EPS and long-term growth forecasts are all obtained from the I/B/E/S database and are scaled by the closing price three days prior to the target price release date. EPS forecast errors equal I/B/E/S actual EPS minus forecasted EPS for the same year and target price forecast error equals the actual price at the end of twelve months following the month of the target price issuance minus the target price forecast. Forecast errors are scaled by the closing price three days prior to the target price release date. Conservatism-bias equals the difference between the ending and beginning balances of hidden reserves (related to LIFO, R&D, and advertising) on the balance sheet (as explained in Section 3.2). Unbiased EPS equals reported EPS minus conservatism-bias. EPS numbers and conservatism-bias are scaled by the closing price three days prior to the target price release date.

Table 2
Effect of conservatism on analysts' EPS forecasts for the sample of 10,695 analyst-firm-year observations

Panel A: Results of regression of analysts' EPS forecasts on unbiased realized EPS and conservatism-bias of the forecast year:

$$FEPS_{ijt+\tau} = \alpha_0 + \alpha_1 UEPS_{it+\tau} + \alpha_2 Conserv\text{-}bias_{it+\tau} + \varepsilon_{ijt+\tau} \qquad (1)$$

Dependent variable is EPS forecast for the year $t+\tau$ (τ = 1, 2)

Variables	**$FEPS_{ijt+\tau}$** (τ = 1)	**$FEPS_{ijt+\tau}$** (τ = 2)
Intercept	0.0236	0.0488
	(<0.0001)	*(<0.0001)*
$UEPS_{it+\tau}$	0.4604	0.1851
	(<0.0001)	*(<0.0001)*
$Conserv\text{-}bias_{it+\tau}$	-0.4026	-0.2226
	(<0.0001)	*(0.0020)*
Adj-R^2	0.608	0.314
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Test of Difference:[a]		
$UEPS_{it+\tau}$ vs. $-Conserv\text{-}bias_{it+\tau}$	*(0.1859)*	*(0.5030)*

Panel B: Results of regression of analysts' EPS forecast errors on conservatism-bias of the forecast year

Dependent variable is EPS forecast error for the year $t+\tau$ (τ = 1, 2)

Variables	**$FE_{ijt+\tau}$** (τ = 1)	**$FE_{ijt+\tau}$** (τ = 2)
Intercept	-0.0014	-0.0072
	(0.4900)	*(0.0290)*
$Conserv\text{-}bias_{it+\tau}$	-0.1511	0.1567
	(0.0910)	*(0.1470)*
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Adj-R^2	0.054	0.074

[a] *P*-values of two-tailed test of difference in coefficient estimates of the stated variables. *p*-values relate to *t*-statistics that are corrected for clustering of standard errors by firm and are reported in parentheses.

Variable definitions: $FEPS_{ijt+\tau}$ equals the forecasted EPS of firm *i* issued by analyst *j* at date *t*, for the year $t+\tau$ (τ = 1, 2). $UEPS_{it+\tau}$ equals unbiased realized EPS of firm *i* for the year $t+\tau$. $Conserv\text{-}bias_{it+\tau}$ equals conservatism-bias in realized EPS of firm *i* for the year $t+\tau$. $FE_{ijt+\tau}$ equals EPS forecast error of firm *i* for forecast issued by analyst *j* at date *t*, for the year $t+\tau$ (τ = 1, 2). All variables are scaled by the closing price three days prior to the target price release date. Other variables are defined in Table 1.

Table 3
Effect of conservatism in analysts' EPS forecasts on their target price forecasts

Panel A: Forward P/E – Results of regression of target price forecasts on unbiased forecasted EPS and the conservatism-bias component of the forecast:

$$TP_t = \beta_0 + \beta_1 UFEPS_{t+\tau} + \beta_2 FConserv\text{-}bias_{t+\tau} + v_t \qquad (2)$$

Dependent variable is 12-month-ahead forecast of date-*t* target price

Variables	**Regression (2)** (τ = 1)	(τ = 2)	**By Industry** (τ = 1)	(τ = 2)
N	10,695	3,814	24	14
Intercept	1.1190	1.1116	1.0540	1.0053
	(<0.0001)	*(<0.0001)*	*(<0.0001)*	*(<0.0001)*
$UFEPS_{t+\tau}$	4.2351	4.0253	5.0777	3.4242
	(<0.0001)	*(<0.0001)*	*(<0.0001)*	*(0.0010)*
$FConserv\text{-}bias_{t+\tau}$	-6.1824	-5.0126	-6.8824	-5.8233
	(0.0270)	*(0.0010)*	*(0.0390)*	*(0.0780)*
Adj-R^2 / *Avg* R^2	0.243	0.3	*0.355*	*0.294*
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	No	No

Table 3 continued...

Panel B: PEG ratio – Results of regression of target price forecasts on inputs to variations of the PEG model:

$$TP_t = \beta_0 + \beta_1(UFEPS_{t+2} - UFEPS_{t+1}) + \beta_2(FConserv\text{-}bias_{t+2} - FConserv\text{-}bias_{t+1}) + v_t \quad (5)$$

$$TP_t = \beta_0 + \beta_1 UFEPS_{t+1} + \beta_2 FConserv\text{-}bias_{t+1} + \beta_3 UAGR_{t+2} + \beta_4 AGRConserv\text{-}bias_{t+2} + v_t \quad (6)$$

Dependent variable is 12-month-ahead forecast of date-*t* target price

Variables	**Regression (5)**	**Regression (6)**	
		r = 10%	*r* = FF
N	3,814	3,807	3,805
Intercept	1.1624	1.1181	1.1099
	(<0.0000)	*(<0.0001)*	*(<0.0001)*
($UFEPS_{t+2}$ - $UFEPS_{t+1}$)	19.421		
	(<0.0001)		
($FConserv\text{-}bias_{t+2}$ - $FConserv\text{-}bias_{t+1}$)	-19.8054		
	(<0.0001)		
$UFEPS_{t+1}$		3.7606	3.9940
		(<0.0001)	*(<0.0001)*
$FConserv\text{-}bias_{t+1}$		-5.3406	-5.5496
		(0.0100)	*(0.0070)*
$UAGR_{t+2}$		13.7711	12.3291
		(<0.0001)	*(<0.0001)*
$AGRConserv\text{-}bias_{t+2}$		-14.3104	-13.0227
		(<0.0001)	*(<0.0001)*
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
Adj-R^2	0.294	0.327	0.319

p-values relate to *t*-statistics that are corrected for clustering of standard errors by firm and are reported in parentheses.

In Panel A, columns 3 and 4, the regressions are estimated by industry (Fama-French 48 industry classification) and means of coefficient estimates and R^2s are reported. *P*-values relate to *t*-statistics that are estimated across industries (similar to Fama-MacBeth).

Variable definitions: TP_t equals the forecasted date-*t* target price issued by the analyst at *t-1*. $FConserv\text{-}bias_{t+\tau}$ equals the conservatism-bias component of the analyst's EPS forecast for the year $t+\tau$, estimated from the first-stage regression (1) of analysts' EPS forecasts on the unbiased and conservatism-bias components of the realized EPS of the forecast year. $UFEPS_{t+\tau}$ is the unbiased component of the analyst's EPS forecast for the year $t+\tau$ which equals ($FEPS_{t+\tau} - FConserv\text{-}bias_{t+\tau}$). $UAGR_{t+2} = UFEPS_{t+2} + rFDPS_{t+1} - (1+r)UFEPS_{t+1}$ is the unbiased abnormal growth, $AGR_{t+2} = FEPS_{t+2} + rFDPS_{t+1} - (1+r)FEPS_{t+1}$, and $AGRConserv\text{-}bias_{t+2} = AGR_{t+2} - UAGR_{t+2}$ is the conservatism-bias component of AGR_{t+2}. $FDPS_{t+1}$ equals the forecasted dividend for year *t+1* based on a constant payout ratio that equals the actual payout ratio in year *t-1*. In Panel B, column (2), the expected rate of return, *r*, is assumed to be a constant 10%, and, in column (3), *r* is estimated using the Fama-French three-factor model at the industry-level. All variables are scaled by the closing price three days prior to the target price release date.

Table 4
Effect of conservatism-bias in future earnings on actual prices
Results of regression of actual prices on unbiased future EPS and conservatism-bias in future EPS.

Dependent variable is actual prices

Variables	**Regression (2)** (τ = 1)	(τ = 2)
N	2,014	1,953
Intercept	0.9118	0.8250
	(<0.0001)	*(<0.0001)*
$UEPS_{t+\tau}$	3.6018	2.5290
	(<0.0001)	*(<0.0001)*
$Conserv\text{-}bias_{t+\tau}$	0.6979	0.8773
	(0.3930)	*(0.1450)*
Adj-R^2	0.365	0.359
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
Test of Difference:[a]		
$UEPS_{t+\tau}$ vs. $Conserv\text{-}bias_{t+\tau}$	*(<0.0001)*	*(<0.0001)*

[a]*P*-values of two-tailed test of difference in coefficient estimates of the stated variables. *p*-values relate to *t*-statistics that are corrected for clustering of standard errors by firm and are reported in parentheses.

Variable definitions: The table reports results of modified regression (2) where actual price at the end of twelve months following the target price release month (*P12*) replaces the target price as the dependent variable, and unbiased EPS and conservatism-bias which are components of realized subsequent EPS are the independent variables. Other variables are defined in Table 2.

Table 5
Relation between (signed) target price forecast errors and conservatism-bias

Panel A: Results of regression of analysts' target price forecast errors on conservatism-bias of subsequent years

Dependent variable is target price forecast error

Variables	**Full sample**		
	(τ = 1)	(τ = 2)	(τ =1+ 2)
Intercept	-0.3825	-0.2950	-0.3079
	(<0.0001)	*(<0.0001)*	*(<0.0001)*
Conserv-bias$_{t+\tau}$	5.5435	6.4746	3.7566
	(<0.0001)	*(<0.0001)*	*(<0.0001)*
Adj-R^2	0.2	0.235	0.232
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes

Panel B: Effect of analyst sophistication on the relation between analysts' target price forecast errors and conservatism-bias of subsequent years: Brokerage firm size and firm-specific experience

Dependent variable is target price forecast error

Variables	**Brokerage Size**		**Firm-Specific Experience**	
	(τ = 1)	(τ = 2)	(τ = 1)	(τ = 2)
Intercept	-0.4227	-0.3089	-0.4251	-0.3072
	(<0.0001)	*(0.0010)*	*(<0.0001)*	*(0.0020)*
High Group	0.0180	0.2118	0.0417	0.0381
	(0.2770)	*(0.3260)*	*(<0.0001)*	*(0.0050)*
Conserv-bias$_{t+\tau}$	6.9664	5.9392	5.5027	6.2503
	(<0.0001)	*(<0.0001)*	*(<0.0001)*	*(<0.0001)*
Conserv-bias$_{t+\tau}$* High Group	-2.1997	-0.1859	-1.2985	-1.3290
	(0.0930)	*(0.8660)*	*(0.0910)*	*(0.0730)*
Adj-R^2	0.184	0.212	0.185	0.213
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes

Table 5 continued…

Panel C: Effect of analyst sophistication on the relation between analysts' target price forecast errors and conservatism-bias of subsequent years: General experience and All-American Team analysts

Dependent variable is target price forecast error

Variables	**General Experience**		**"All-American" Team**	
	(τ = 1)	(τ = 2)	(τ = 1)	(τ = 2)
Intercept	-0.4156	-0.2996	-0.3009	-0.2991
	(<0.0001)	*(0.0020)*	*(<0.0001)*	*(0.0020)*
High Group	0.0186	0.0126	0.0512	0.0370
	(0.0650)	*(0.2910)*	*(0.0040)*	*(0.0400)*
Conserv-bias$_{t+\tau}$	5.2837	5.7667	5.0794	5.7193
	(<0.0001)	*(<0.0001)*	*(<0.0001)*	*(<0.0001)*
Conserv-bias$_{t+\tau}$* High Group	-0.5727	-0.0361	-0.7651	0.9622
	(0.4370)	*(0.9600)*	*(0.6050)*	*(0.4910)*
Adj-R^2	0.184	0.212	0.185	0.213
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes

p-values relate to *t*-statistics that are corrected for clustering of standard errors by firm and are reported in parentheses.

Variable definitions: Target price forecast error is measured as (1+ex-dividend 1-yr return) -*TP/P*, where *P* is the closing price three days prior to the target price release date. In Panel B, "High Group" equals one for the highest tercile of analysts ranked by brokerage firm size in columns (1-2), and firm-specific experience in columns (3-4), zero otherwise. In Panel C, "High Group" equals one for the highest tercile of analysts ranked by general experience in columns (1-2), and *Institutional Investor*'s "All American" team analysts in columns (3-4), zero otherwise. Brokerage firm size equals the number of analysts belonging to a brokerage firm in each year. Firm-specific experience equals the number of years an analyst follows a firm from 1985 onward. General experience equals the number of years an analyst appears in the I/B/E/S database from 1985 onward. Other variables are defined in Tables 2 and 3.

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

Panel A: Results of regression (7) of future returns on target prices and control variables:

$$R_{t+1} = \psi_0 + \psi_1 Q(TP/P) + \psi_2\beta + \psi_3 Size + \psi_4 B/M + \psi_5 R_t + \eta_{t+1} \quad (7)$$

Dependent variable is year-ahead returns (R_{t+1})

	Quintiles of conservatism-bias				
Variables	**Q5**	**Q4**	**Q3**	**Q2**	**Q1**
Mean Conserv-bias	0.0859	0.0101	0.0022	-0.0001	-0.0276
Intercept	0.0900	0.2288	0.1970	0.1792	0.2173
	(0.4102)	*(0.0658)*	*(0.2233)*	*(0.1192)*	*(0.1926)*
Q(TP/P)	-0.1416	-0.1038	-0.0673	-0.0236	-0.1015
	(0.0186)	*(0.0571)*	*(0.2107)*	*(0.6100)*	*(0.0769)*
Beta	-0.0224	-0.0534	-0.0704	-0.0590	0.0076
	(0.5429)	*(0.1104)*	*(0.1658)*	*(0.1802)*	*(0.8279)*
(log) Size	-0.0014	-0.0133	-0.0126	-0.0118	-0.0215
	(0.9082)	*(0.1901)*	*(0.3570)*	*(0.3054)*	*(0.1806)*
B/M	0.2483	0.1739	0.1771	0.1898	0.1716
	(0.0188)	*(0.0418)*	*(0.0319)*	*(0.0024)*	*(0.0687)*
Prior-year return	-0.0703	-0.0531	-0.0757	-0.0463	-0.1322
	(0.3618)	*(0.4929)*	*(0.2993)*	*(0.5125)*	*(0.0844)*
Adj-R^2	2.74%	2.77%	4.64%	3.26%	4.18%

Table 6 continued…

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

Dependent variable is year-ahead returns (R_{t+1})

Variables	**Q5**	**Q1**
Intercept	-0.0017	0.1764
	(0.9872)	*(0.2282)*
Low (TP/P)	0.0650	0.0357
	(0.0112)	*(0.1645)*
High (TP/P)	-0.0339	-0.0526
	(0.3633)	*(0.1400)*
Beta	-0.0235	0.0083
	(0.5286)	*(0.8106)*
(log) Size	-0.0002	-0.0222
	(0.9902)	*(0.1540)*
B/M	0.2511	0.1715
	(0.0175)	*(0.0661)*
Prior-year return	-0.0665	-0.1319
	(0.3869)	*(0.0870)*
Adj-R^2	2.70%	4.22%

p-values relate to *t*-statistics that are corrected for clustering of standard errors by year and are reported in parentheses.

Variable definitions: R_{t+1} equals security returns of a firm over the year $t+1$, i.e., over a period of twelve months beginning at the end of the fourth month after the fiscal-year end. 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. Beta equals the CAPM beta estimated from a regression of firm returns minus the risk-free (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. Size equals the log of market value at the end of the previous fiscal-year. B/M is the book-to-market ratio which equals book value of equity divided by market value of equity at the end of the previous fiscal-year. Prior-year return captures price momentum and is measured as returns over a period of twelve months ending in the fourth month after the fiscal-year end. In Panel B, Low (*TP/P*) includes firms in the lowest two quintiles of *TP/P*, and High (*TP/P*) includes firms in the highest two quintiles of *TP/P*.