9-2012

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September 2012

We thank Xia Chen, Qiang Cheng, Kai Wai Hui, Bin Ke, Mozaffar Khan, Dan Segal, Siew Hong Teoh, Ramgopal Venkataraman, Ivy Zhang, seminar participants at the University of California - Irvine, and participants at the Accounting Assistant Professors' Research Conference at National University of Singapore, and New Accounting Faculty Conference at Melbourne Business School for helpful discussions and comments. We gratefully acknowledge the financial support provided by the Accounting Research Center of the Carlson School of Management at the University of Minnesota and the School of Accountancy Research Center at Singapore Management University.

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Abstract

Conservatism in earnings does not have a direct impact on the present value of future cash flows. This paper examines whether financial analysts correctly undo the effect of accounting conservatism incorporated in their own 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 deriving their target price forecasts. More sophisticated analysts undo the effect of conservatism to a greater extent than other analysts, although their target price forecasts also exhibit conservatism-induced 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 a distortion 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, and 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, the asymmetric treatment of different economic outcomes can introduce 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 pricing errors (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 (if any) leads to a distortion of market prices.

Specifically, we test whether analysts, who are relatively sophisticated market participants, understand the valuation implications of accounting conservatism in their own earnings forecasts when forecasting target prices. Prior research finds that on average analysts' earnings forecasts reflect the effect of accounting conservatism at least partially (Li 2008, and Pae and Thornton 2010). This finding makes sense since analysts have incentives to minimize forecast errors measured relative to reported earnings. However, accounting conservatism does not have a direct (downward) impact on the present value of expected payoffs. While it is appropriate for analysts to incorporate the expected downward bias due to accounting conservatism in their earnings forecasts, such bias should not affect their target price forecasts. Therefore, when using their earnings forecasts in their valuation task, analysts ought to be adding back the amount of conservatism-induced bias that they themselves have incorporated in their earnings forecasts. In this paper, we examine whether analysts make appropriate adjustments to undo the effect of conservatism in their own earnings forecasts when using these forecasts as inputs to derive their

target prices.

Prior research argues that analysts have few incentives to forecast target prices accurately, because their compensation and job tenure seem to be unrelated to the attainment of their price target. Consistent with this argument, prior studies find the investment performance of analysts' target prices to be unimpressive on average (Asquith, Mikhail and Au 2005, and Bradshaw, Brown and Huang 2012). At odds with the view that analysts issue target prices simply to support their stock recommendations, prior research finds a significant market reaction to analysts' target price revisions, and moreover, this reaction is incremental to that of the contemporaneously issued stock recommendations and earnings forecast revisions (Brav and Lehavy 2003, and Asquith et al. 2005). In fact, for a sample of *Institutional Investors*' "All American" 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 findings suggest that any bias in the derivation of target prices could potentially result in a distortion of market prices.

We employ two approaches to test whether analysts add back the effect of accounting conservatism incorporated in their earnings forecasts when deriving their target prices. In the first approach, we track the process that analysts may follow to estimate the target price by using their forecasts of earnings and earnings growth as inputs to a valuation formula. In the second approach, we directly examine (signed) target price forecast errors to determine whether they are systematically associated with accounting conservatism.

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 accounting conservatism 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

[1]Prior research shows that earnings forecast accuracy is related to analysts' career outcomes (e.g., Stickel 1992, Mikhail, Walther and Willis 1999, and Hong, Kubik and Solomon 2000).

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. 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 first examine the relation between analysts' earnings forecasts and the earnings effect of conservatism (termed conservative-bias, henceforth) to determine whether analysts incorporate conservatism into their earnings forecasts.[2] Our results show that analysts do incorporate the effect of conservatism into their one-year- and two-year-ahead earnings forecasts, although the adjustment is not complete. Our main purpose in this initial analysis is to identify the portion of an analyst's earnings forecast that reflects conservative-bias.

Next, we examine whether the portion of conservative-bias embedded in analysts' own earnings forecasts affects their contemporaneous target price forecasts. The challenge we face in this analysis is that the process used by analysts to generate their price targets is unobservable. Relying on prior findings, we assume that analysts estimate target prices by using an earnings-based valuation formula. 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 (P/E) ratio or the relative P/E ratio. Bradshaw (2002) finds that target prices on average are based on valuation heuristics, such as the price-earnings-to-growth (PEG) ratio, rather than on sophisticated models such as the residual income model RIM). Suppose analysts value a firm using the historical P/E multiple, then any expected change in conservative-bias that is incorporated in their earnings forecast will result in a distortion of their target price forecast, because the P/E multiple is historical.[3] Even if analysts use a relative P/E (say relative to industry peers), there will be a distortion of their target price forecast to the extent the expected change in the firm's conservative-bias differs from the expected change in conservative-bias of its industry peers.

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

[3]The Appendix includes a numerical example that shows how accounting conservatism can lead to bias in analysts' target price forecasts.

If, as suggested by Bradshaw (2002), analysts use the PEG ratio to value firms, then to the extent that they fail to adjust their long-term earnings growth rate to account for the fact that their short-term earnings forecasts are understated due to the effect of conservative-bias, there will be a distortion of analysts' target price forecasts. Thus, it seems likely that when analysts use simple valuation heuristics in deriving their target price forecasts, they may not correctly undo the effect of conservative-bias in their own earnings forecasts.

Applying alternative valuation formulae, we assess the impact of conservative-bias in analysts' annual earnings forecasts on their 12-month-ahead target price forecasts, by regressing target price forecasts on analysts' inputs to the valuation model, namely analysts' one-year-ahead and two-year-ahead earnings forecasts, their long-term growth rate forecast, and the conservatism-induced portion of these forecasts. Regardless of the valuation model/heuristic examined, we find that analysts do not fully undo the conservative-bias in their own forecasts of future earnings and earnings growth when deriving their target price forecasts. Since our results based on this approach inherently involve assumptions about the process followed by analysts to derive target prices, we employ the second approach which helps to corroborate the evidence by directly examining target price forecast errors. Consistent with the evidence from the first approach, we find a significant positive association between conservative-bias and target price forecast errors (after controlling for other factors known to be related to forecast bias). In examining differences among analysts, we find that target prices of relatively sophisticated analysts (based on brokerage size and experience) have lower bias due to earnings conservatism, although significant bias is still present. Collectively, from the evidence provided by the two approaches, analysts do not appear to fully undo the effect of conservative-bias in their own earnings forecasts when deriving target prices.

In contrast to analysts' target prices, we find that on average market prices substantially unravel the effect of conservative-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 accounting conservatism leads to a bias in analysts' target price forecasts. This is especially a concern because prior research finds that

revisions of analysts' target price forecasts have a significant price impact. Additional analysis shows that firms with a relatively low target price and high conservative-bias earn significantly positive future excess returns and firms with a relatively high target price and negative conservative-bias earn significantly negative future excess returns. The effect on future returns is especially strong for firms with high conservative-bias; for this group of firms, we find that the differential excess return in the subsequent year for the low minus the high target price groups is around 14% after controlling for variables that are known to explain the cross-section of returns. The systematic return performance suggests that the market undervalues (overvalues) firms, when analysts' target price forecasts are significantly underestimated (overestimated) due to accounting conservatism.

Our results are subject to some caveats. First, we only examine the effect of unconditional conservatism on earnings forecasts; we believe that events that lead to conditional conservatism (e.g., asset impairment) are hard to predict and hence may have a small effect on analysts' forecasts.[4] Second, our measures of conservative-bias may not accurately capture the analyst's assessment of the impact of conservatism on his/her earnings forecast. If that is the case, our finding that analysts do not fully undo the effect of conservative-bias in their own forecasts could be due to noise in our proxy for the analyst's assessment of conservative-bias. However, our results of cross-sectional differences in analysts' ability (i.e., sophistication and experience) to undo conservative-bias, and of the effect of conservative-bias and target prices on market mispricing, are inconsistent with this alternative explanation.

Our paper contributes to the literature on analysts' forecasts by examining the interplay between forecasts of different attributes, namely earnings and target prices. To our knowledge, this is the first paper that demonstrates how the same information set impacts the forecast accuracy of different attributes differentially. 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 are then transmitted to investors and lead to pricing

[4]On the other hand, for our sample, we find that the average effect of the bias due to *unconditional* conservatism is quite substantial, at 13.6% of reported earnings.

errors, especially for firms with high conservative-bias. Thus, our study also contributes to the literature on the valuation consequences of conservative accounting.

Our findings have practical implications for analysts in relation to their target price 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 their accurate forecasting of conservative earnings. Our evidence therefore suggests 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. Target price inaccuracy can at least partly be attributed to analysts' use of heuristics to value firms. Gleason, Johnson and Li (2012) point out that "in general, heuristics are quite useful but sometimes they lead to severe and systematic errors." If analysts were to use a full-blown discounted cash flow (DCF) model or a residual income valuation model with appropriate adjustment to long-term earnings growth to account for prior conservatism in accounting, we may not observe the systematic (conservatism-related) under-/over-statement of target prices. Our evidence therefore highlights the limitations of using heuristics such as the P/E or 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.

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

In current times, 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 in reported earnings due to 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 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 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 and analysts' forecasts, but find less asymmetry in analysts' forecasts relative to reported earnings. Using the beginning market-to-book ratio as a proxy for balance sheet reserves, they further find that analysts' forecasts do not fully allow for the fact that earnings of firms with higher (lower) reserves, generated by more (less) conservative accounting in prior years, are likely to exhibit less (more) asymmetric timeliness in the current year. Collectively, prior evidence shows that analysts do adjust for conservatism when forecasting earnings, but the adjustment is not complete.

It is well-established that stock recommendations are an important output of financial analysts. Research shows that stock prices react to upgrades and downgrades of stock recommendations (Womack 1996). Research also shows that stocks with favorable (unfavorable) consensus stock recommendations outperform (underperform) the market (Barber, Lehavy, McNichols and Trueman 2001). 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.[5] Target price forecasts, being more granular than stock recommendations, are likely to provide a more powerful test setting.

Prior research demonstrates that analysts' target prices are informative to market participants.

[5]Based on a hand-collected sample of research reports, Bradshaw (2002) finds that analysts use target prices as justification for their stock recommendations in over two-thirds of the reports examined and higher target prices are associated with more favorable stock recommendations.

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] Further, for a sample of All-American team analysts, the market impact of target price revisions is greater than that of earnings forecast revisions of the same magnitude (Asquith et al. 2005). Although target prices convey information to the market, the evidence in Bradshaw et al. (2012) shows that only 45% of analysts' 12-month-ahead price targets are attained at any time during the one-year forecast horizon. Asquith et al. (2005) find that 54% of stocks with target price forecasts of All-American team analysts are attained over the one-year forecast horizon, with prices 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 is unremarkable.

Since earnings forecasts are a critical input for estimating price targets in most commonly used valuation approaches, accurate earnings forecasts should lead to high quality target price forecasts. Contrary to this expectation, Bradshaw et al. (2012) show that superior earnings forecasting ability does not translate to superior forecasts of target prices. If accurate earnings forecasts incorporate conservative-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 change in investment growth. They conclude that conservative accounting coupled with temporary changes in investment growth leads to pricing errors. Our first approach, therefore, does not benchmark target prices against actual prices; rather we trace the valuation path followed by analysts and examine how the conservative-bias component of an analyst's earnings forecast maps into the same analyst's target price forecast.

[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.

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 (P/E) ratio, while only 13% report using some variation of the discounted cash flow model in estimating their price targets. Bradshaw (2004) considers different specifications of earnings-based valuation models/heuristics to examine how analysts' earnings forecasts might be linked with their stock recommendations. He finds strong evidence that analysts' recommendations are explained by the PEG ratio and analysts' long-term growth projections.[7] Bradshaw (2002) also finds that valuations based on the PEG ratio have a higher correlation with analysts' price targets relative to valuations based on industry P/E ratios.[8] Relying on these prior findings, we make alternative assumptions about the earnings-based valuation formula used by analysts and test whether the analyst's target price forecast adjusts for the conservative-bias incorporated in the analyst's own contemporaneously-issued earnings forecasts.

We hypothesize that, since analysts are known to convert their earnings forecasts to target prices based on simplified valuation models/heuristics, target price forecasts will not be fully adjusted for the conservative-bias in analysts' earnings forecasts.[9] First, due to limited sophistication, analysts who forecast target prices based on heuristics using short-term forecasts of earnings may fail to appreciate that conservative accounting affects the predictability of sustainable future earnings when there is a change in investment growth (Penman and Zhang, 2002). Second, even sophisticated analysts may not have strong incentives to accurately forecast target prices. Bradshaw et al. (2012) find weak evidence of persistent differences among analysts in their ability to forecast target prices. Their results lead them to conclude

[7]Several prior studies also examine the mapping of analysts' earnings forecasts to their stock recommendations and find that the analyst's translational effectiveness is influenced by his/her investment banking relationship (Ertimur et al. 2007, and Chen and Chen 2009), as well as insider trading, institutional ownership and investor sentiment (Ke and Yu 2009).

[8]Gleason et al. (2012) find superior target-price investment performance when analysts appear to be using more rigorous valuation techniques (i.e., RIM) rather than simple heuristics. However, superior performance is observed only for 20% of their sample at most (the quintile that most favors RIM); this implies that at least 80% of firm-analysts most likely use simple heuristics rather than full-blown valuation models. This is consistent with Bradshaw (2004) who finds little support for analysts' use of the residual income model to derive valuations implied by their stock recommendations.

[9]The Appendix presents a numerical example showing how accounting conservatism can lead to bias in target price forecasts.

that, since in general target price forecast accuracy does not appear to be explicitly tied to analysts' compensation and career concerns, analysts may not have sufficiently strong incentives to issue accurate target price forecasts. Analysts may instead exploit this opportunity to provide ex post justification for their stock recommendations. Thus, either due to lack of sophistication or lack of incentives (or both), it is likely that analysts fail to undo the effect of conservatism in their earnings forecasts when deriving their target price 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. Research Design

3.1 Data and sample selection

We obtain analysts' earnings forecasts and target prices from the I/B/E/S database for all non-financial U.S. firms over the years 1999 through 2007.[10] We initially identify 340,116 12-month target price forecasts issued by 6,978 analysts affiliated with 513 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. Similar to prior studies, for each target price, we identify one-year-ahead 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.[11] 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 62,781 analyst-firm-year observations.

We impose several additional requirements to obtain the final sample. Following Bradshaw et al. (2012), we require the closing share price three days prior to the target price forecast date to exceed $1 to mitigate the influence of thinly traded stocks. Further, we require the actual stock price at the end of the

[10]Previous studies generally obtain target prices from First Call which provides data at the brokerage-firm level, e.g., Bradshaw et al. (2012) and Gleason et al. (2012). Since April 2009, I/B/E/S 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 brokerage-firm level data from First Call with analyst-level data from I/B/E/S.

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

twelfth month following the target price forecast date for the purpose of calculating forecast errors. Similarly, we require realized earnings of subsequent years to assess the accuracy of annual earnings forecasts. 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 43,739 analyst-firm-year target price forecasts and associated earnings forecasts. These forecasts are issued by 4,796 individual analysts affiliated with 386 distinct brokerage companies and cover 3,449 distinct firms over the years 1999 through 2007.[12] Our sample includes an average of 3.34 analyst target price forecasts for a firm-year. The sample exhibits a concentration of firms in petroleum and natural gas (7.1%), retail (7.8%), electronic equipment (9.5%), and business services (14.5%) industries.

To obtain 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. The limited availability of long-term growth forecasts reduces the sample size to 15,008 analyst-firm-year observations for the PEG valuation.

3.2 Measure of conservative-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 (termed conservative-bias). Similar to Penman and Zhang (2002), we estimate hidden reserves to capture the effect of conservative accounting treatment of specific assets, where hidden reserves equal the sum of inventory reserve, R&D reserve, and advertizing reserve. We acknowledge that our measure disregards other forms of hidden reserves related to other assets and liabilities. However, we find that the sum-total

[12]Our target price sample ends in 2007 because we need the subsequent two years' CRSP and Compustat data for each target price observation; thus, overall we use data up to the year 2009.

of these three reserves has a major impact (13.6%) on reported earnings, suggesting that our measure captures an economically significant portion of the total hidden reserves.

Inventory reserve (*INVENRES*) 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 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.[13] *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 two-year useful life. Thus, advertising reserve (*ADVRES*) equals:

$$ADVRES_t = ADV_t + 1/3\times ADV_{t-1}$$

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).[14] Since conservative-bias captures the change in these reserves, it will be zero when investment growth is in steady state and non-zero when investment growth changes from year to year.

3.3 Effect of conservatism on earnings forecasts

We examine whether analysts incorporate the effect of accounting conservatism into their one-year- and two-year-ahead earnings forecasts. We first split reported earnings into two components –

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

[14]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.

conservative-bias (i.e., the income statement effect of conservatism as explained in Section 3.2) and the remainder which we call "unbiased" earnings. Then, we estimate a cross-sectional time-series regression of the analyst's annual earnings forecast on the firm's unbiased earnings and conservative-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 EPS of firm i for year $t+\tau$, and $Conserv\text{-}bias_{it+\tau}$ equals the conservative-bias in earnings of firm i for year $t+\tau$. Regression (1) is estimated with year and industry fixed effects. All variables are scaled by the closing price three days prior to the forecast date. Since we measure conservative-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 conservative-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 conservative-bias, we expect $\alpha_1 = |\alpha_2|$ if analysts fully incorporate conservative-bias into their earnings forecasts, and $\alpha_1 > |\alpha_2|$, if the conservative-bias in 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 conservative-bias was incorporated by analysts into their earnings forecasts. We use the ex post realization as one of our measures of expected conservative-bias because the magnitude of conservative-bias forecasted by the analyst is unknown. If the realized conservative-bias is not perfectly forecasted by the analyst, the results of regression (1) may incorrectly suggest that the analyst did not fully consider the effect of conservative accounting when forecasting earnings.[15] To address this concern, we also estimate regression (1) using expected conservative-bias, *Conserv-bias (2)*, based on an expectation model

[15]Note however that this will not be a matter of concern for our subsequent analyses since our main purpose is not to show whether or not analysts incorporate conservative-bias in their earnings forecasts (either fully or partially). Our purpose is to test whether the *amount* of conservative-bias that is included in analysts' earnings forecasts is unraveled by them (fully or partially) when they use these forecasts as inputs to derive the target price.

estimated from historical time-series data. Specifically, for each firm, we estimate a second-order autoregressive model of conservative-bias (scaled by end-of-the-year total assets) over a 30-year period ending in 2007. Our rationale for using this model is our finding that on average conservative-bias follows a mean-reverting process and the reversion is almost complete by the end of two years (autocorrelation coefficients: ρ_1=0.43, ρ_2=0.21, ρ_3=0.06). Similarly, instead of realized unbiased earnings, we use expected unbiased earnings based on a naïve random walk model as the independent variable in regression (1).

3.3.1 First-stage regression

Since we are interested in assessing if analysts reverse the conservative-bias incorporated in their earnings forecast when deriving their target price forecast, we estimate the conservative-bias component of the analyst's earnings forecast from a first-stage regression. We estimate regression (1) with *Conserv-bias*$_{it+\tau}$ interacted with industry dummies (based on the Fama-French 48 industry classification) because we expect the level of accounting conservatism and its effect on earnings forecasts to vary by industry. Using the estimated coefficient, $\hat{\alpha}_{2k}$, for each industry *k* obtained from the first-stage, the conservative-bias component of the forecast is calculated as *FConserv-bias* = - ($\hat{\alpha}_{2k}$ x *Conserv-bias*). As explained above, we use two estimates of conservative-bias, one based on realized earnings and conservative-bias, *FConserv-bias (1)*, and the other based on expected earnings and expected conservative-bias, *FConserv-bias (2)*.[16] We examine the effect of *FConserv-bias* on target prices in the second-stage regression discussed in the next section.

3.4 Effect of conservatism on target prices

In implementing our first approach, where we track the process followed by analysts to derive target prices, we consider alternative earnings-based valuation models/heuristics that may be used by analysts to formulate their target price forecasts.

[16]Since α_{2k} is expected to be negative, we multiply ($\hat{\alpha}_{2k}$ x *Conserv-bias*) by -1 so that a higher value of *FConserv-bias* denotes a higher level of conservative-bias.

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 EPS forecast of the analyst, i.e., $P_0 = \varphi FEPS1$ (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 conservative-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 EPS forecast for year *t+1*, $FEPS_{t+\tau}$, and the conservative-bias component of the *t+1* earnings forecast, $FConserv\text{-}bias_{t+1}$. 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 the EPS forecast issued at date *t-1* for the year *t+1* after the target price date *t* as the input to the analyst's valuation.[17] Specifically, we estimate the following regression:

$$TP_t = \theta_0 + \theta_1 FEPS_{t+1} + \theta_2 FConserv\text{-}bias_{t+1} + \omega_t \quad (2)$$

All variables are scaled by the closing price three days prior to the target price forecast date.[18] We expect a positive and significant θ_1 if forward earnings are used as an input to estimate the target price. Since *FEPS* is understated on average due to conservative-bias, θ_2 is expected to be positive and significant, if analysts add back the conservative-bias in their own forecast, $FEPS_{t+1}$, when estimating the target price.

3.4.2 PEG ratio

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 the findings of Bradshaw (2004), we use a PEG-type valuation model to examine whether analysts add back the conservative-bias in their earnings forecasts when deriving target prices. An appealing feature of the PEG model is that it

[17]In other words, earnings of year *t+1* are forward earnings in relation to the target price at date *t*.

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

incorporates the analyst's growth rate forecast into the valuation formula. Analysts' long-term (3-5 years) growth rate may adjust for the fact that, if current earnings are lower due to conservatism, then future earnings will 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 conservative-bias in earnings of years *t+1* (ρ=0.15) and *t+2* (ρ=0.13). Hence, it is possible that the effect of conservatism in one-year-ahead and two-year-ahead earnings forecasts will be offset by the higher forecasted earnings growth rate, resulting in unbiased target price estimates. The PEG-type valuation model we use is a simplification of the abnormal earnings growth model (OJ model) developed by Ohlson and Juettner-Nauroth (2005). 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:

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

Note that the model incorporates the analyst's forecast of 3-5 years long-term growth rate which is used to derive the forward earnings of year *t+2*. We expect β_1 to be positive and significant. β_2, the coefficient on the change in forecasted conservative-bias, is expected to be positive and significant, if analysts add back the effect of conservatism in their earnings forecasts when valuing the firm.

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 (iii) the expected rate of return, *r*. We then calculate the conservative-bias in AGR_{t+2} as $AGRConserv\text{-}bias_{t+2} = FConserv\text{-}bias_{t+2} - (1 + r)FConserv\text{-}bias_{t+1}$. 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):

$$TP_t = \beta'_0 + \beta'_1 FEPS_{t+1} + \beta'_2 FConserv\text{-}bias_{t+1} + \beta'_3 AGR_{t+2} + \beta'_4 AGRConserv\text{-}bias_{t+2} + \upsilon'_t \quad (6)$$

We expect β'_1 and β'_3 to be positive and significant. β'_2 and β'_4 are expected to be positive and significant, if analysts adjust for the effect of conservatism in their forecasts of earnings and earnings growth when valuing the firm.

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 25% 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.[19] As evident from the target price forecast error, target prices on average overshoot the 12-month ahead realized price by about 15%, indicating that target prices are optimistic on average (consistent with Bradshaw et al., 2012). The

[19]The mean *TP/P* of our sample (1999-2007) is lower than that reported by prior studies – 25% versus 32% in Gleason et al. (2012) over 1997-2003, and 35% in Bradshaw et al. (2012) 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. We conjecture that the decline in *TP/P* after 2003 perhaps results 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.

mean long-term growth rate forecast is 19.1% for our sample. While the mean actual EPS is 4.2% of price, the mean unbiased EPS is higher at 4.8% and the mean conservative-bias is 0.6%. Thus, the reported EPS of our sample is understated by about 12.5% 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 regression (1) of analysts' one-year- or two-year-ahead EPS forecasts on the two components of EPS of the year for which the forecast is made – unbiased EPS and conservative-bias. Columns (1) and (2) report results using the actual (i.e., realized) unbiased EPS and actual conservative-bias [*Conserv-bias (1)*] of the year being forecasted, and columns (3) and (4) report results using expected unbiased EPS and expected conservative-bias [*Conserv-bias (2)*] of the year being forecasted. Variables in all regressions are winsorized at the extreme 1% of their distributions to mitigate the influence of outliers. For both one-year and two-year ahead forecasts, the mean 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 conservative-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 conservative 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. Results using expected rather than actual values of unbiased EPS and conservative-bias (in columns 3 and 4) also indicate that analysts adjust the effect of expected conservatism in their one-year- and two-year-ahead EPS forecasts.

Consistent with prior research (e.g., Li 2008), we also estimate a regression of the signed earnings forecast error (actual minus forecast) on conservative-bias to examine the extent to which analysts incorporate the effect of conservatism into their earnings forecasts. If analysts do not fully incorporate the effect of conservatism, the coefficient on conservative-bias should be negative and significant. From Panel B, we find a significant negative coefficient estimate on conservative-bias in columns (1) and (3), suggesting that analysts do not fully adjust the effect of conservatism in their one-year-ahead forecasts. Column (2) shows an insignificant effect while column (4) shows a weakly significant effect of conservative-bias on analysts' two-year-ahead forecast errors.

Overall, our results suggest that analysts do incorporate the effect of conservative accounting into their earnings forecasts at least partially. While prior studies have already documented this effect using different approaches, our purpose is simply to establish that analysts do incorporate conservative-bias into their earnings forecasts. This sets the base-line for the next sub-section, in which we examine the extent to which analysts undo the conservative-bias embedded in their earnings forecasts when deriving their own target price forecasts.

4.2 Effect of conservatism on target price forecasts

Table 3 reports results of the regression of target prices on EPS forecasts and the forecasted conservative-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) in columns (1) and (3), assuming that analysts derive their target price forecasts based on the forward P/E multiple using the EPS forecast of year *t+1*. If analysts correctly add back the effect of conservatism in their EPS forecasts, then the coefficient on forecasted conservative-bias should be significantly positive.[20] From the estimation of

[20]We do not test for the equality of coefficient estimates of the two independent variables because conservative-bias may have some positive effects on firm value if it reflects the benefits of contracting or investing efficiency, and such effects will result in differential coefficients on earnings forecasts and conservative-bias.

regression (2), we find that the forward EPS is positively related to the target price as expected.[21] However, the coefficient estimate on *FConserv-bias*$_{t+1}$ (both actual and expected) is insignificant, suggesting that analysts do not undo the effect of conservatism in their earnings forecasts when deriving their own target price forecasts.

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 conservative-bias in their EPS forecasts can potentially be canceled out by the industry-level conservative-bias in the denominator of the industry P/E. To the extent, the firm's conservative-bias differs from the average level of industry conservative-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-specific conservative-bias in arriving at their target prices. Columns (2) and (4) of Panel A report the mean coefficient estimates and *t*-statistics estimated across industries (similar to Fama-MacBeth).[22] The mean coefficient estimate on $FEPS_{t+1}$ is positive and significant as expected, but the mean coefficient estimate on *FConserv-bias*$_{t+1}$ is insignificant. Thus, even if analysts base their target price forecasts on industry rather than firm-level P/E, our results indicate that firm-specific conservative-bias in their EPS forecasts influences their target price forecasts.

4.2.3 PEG Ratio

Table 3, Panel B, reports results of the regression of target prices on forecasts of EPS and EPS growth and the forecasted conservative-bias assuming that analysts use alternative specifications of the PEG valuation model to arrive at their target prices. We report results based on the actual conservative-bias [*FConserv-bias (1)*] in columns (1-3) and expected conservative-bias [*FConserv-bias (2)*] in columns

[21]The coefficient estimate on the EPS forecast 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 16 – roughly the average forward P/E.

[22]We form industry-groups based on the Fama-French 48-industry classification (Fama and French, 1997). Our requirement of at least 100 analyst-firm observations per industry reduces the sample size to 41,490 observations representing 32 industries for column (2) and 21,599 observations representing 28 industries for column (4).

(4-6). Columns (1) and (4) present results of regression (5) based on the simplified OJ model which assumes zero dividends and $\gamma = 0$. The estimated coefficient on the change in forecasted EPS_{t+2} is positive and significant as expected. If analysts correctly add back the conservative-bias embedded in their EPS forecasts in deriving their target prices, we should observe a positive and significant coefficient estimate on the change in forecasted conservative-bias. Our results show that the estimated coefficient on the change in $FConserv\text{-}bias_{t+2}$ is insignificant, indicating that target prices are not based on forecasts of unbiased earnings and earnings growth but include the effect of conservative accounting. In columns (2-3) and (5-6), we report results of the less restrictive valuation formula captured by regression (6) with an assumed dividend payout and expected rate of return, r (used to obtain abnormal earnings growth, AGR_{t+2}). Results in columns (2 and 5), with a constant r=10%, and in columns (3 and 6), with the Fama-French industry-specific r (mean = 11.4%), show that the estimated coefficients on forecasted EPS_{t+1} and AGR_{t+2} are both positive and significant as expected. If analysts add back the conservative-bias in their earnings forecast of year *t+1*, we would observe a significant positive coefficient estimate on $FConserv\text{-}bias_{t+1}$; our results however indicate an insignificant coefficient estimate. Similarly, if analysts adjust the effect of conservative-bias in their earnings growth forecast, we would expect to observe a significant positive coefficient estimate on $AGRConserv\text{-}bias_{t+2}$; however, we obtain insignificant coefficient estimates in columns (2-3) as well as columns (5-6).

There may be a concern that the reason we obtain insignificant coefficient estimates on forecasted conservative-bias is because our proxies for forecasted conservative-bias are measured with error. However, if the variables were simply noise, we would not find a *significant* negative correlation between analysts' EPS forecasts and our measure of conservative-bias (ρ_{t+1} = -0.12; ρ_{t+2} = -0.11). In the sections that follow, we provide further support for our proxies of conservative-bias via our cross-sectional analysis and market mispricing tests.

Collectively, our results indicate that, regardless of the model specification used, analysts on average do not undo the effect of conservatism in their earnings forecasts when deriving their forecasts of target prices. We acknowledge that this approach involves 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 add back the effect of conservative-bias when formulating their price targets. To the extent the average analyst is likely using a P/E multiple or PEG model to value a firm (as shown by prior research), we believe our finding for the average analyst is valid. In the next section, 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 regressions with 12-month-ahead actual stock price (*P12*) instead of the target price forecast as the dependent variable. We do not assume a specific valuation model that the market may use. Instead, we assume that the market price incorporates information in future earnings and we examine whether the effect of conservatism in future earnings is adjusted in arriving at the stock price. We test the extent to which subsequent realized earnings versus subsequent realized conservative-bias (and subsequent expected earnings versus subsequent expected conservative-bias) are incorporated into the current stock price. The regression is estimated at the firm-year level (which explains the shrinkage in sample size relative to previous tables). We fix the valuation date as the target price issuance date of one randomly selected analyst following the firm in a given year. The coefficient estimates on EPS_{t+1} and EPS_{t+2} are positive and significant as expected.[23] If the market correctly adds back the effect of conservative accounting embedded in earnings in valuing the stock, we should observe a positive and significant coefficient on the conservative-bias variables. Independent variables are realized values in columns 1 and 2 and expected values in columns 3 and 4. We find that the coefficient estimate on $Conserv\text{-}bias_{t+\tau}$ (realized as well as expected) is positive and significant for all τ, although it is lower than the coefficient estimate on the EPS of the respective year. Thus, relative to analysts' target prices, there

[23]Consistent with prior research (e.g., Liu, Nissim and Thomas 2002), we delete negative EPS (or negative forecasted EPS) for the purpose of this analysis because of the difficulty in basing valuations on negative earnings.

appears to be less distortion of market prices due to conservative-bias on average.[24] Given that realized prices are more efficient than target prices in valuing conservatively-determined earnings, target price *errors* can be used to evaluate the quality of target price forecasts. In the next sub-section, we examine the effect of conservative-bias on target price forecast *errors* to corroborate our findings in Table 3.

4.4 Conservative-bias and target price forecast errors

Table 5, Panel A, presents results based on our second approach which does not depend on assumptions regarding the valuation model used by analysts in estimating target prices. We estimate the regression of target price forecast errors on conservative-bias in EPS of years *t+1* and *t+2* relative to the target price forecast date *t-1*. Similar to Bradshaw et al. (2012), 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).[25]

We include several other independent variables which are suggested by prior research to have an impact on analyst forecast bias, namely analysts' long-term growth forecast, firm size (log of market value), book-to-market ratio, prior year's returns, and return volatility, where all variables are measured at the beginning of the target price issuance year. We also include a variable, termed *Conflict*, which captures analysts' incentives for issuing optimistic forecasts. Similar to Ertimur, Sunder and Sunder (2007) and Gleason et al. (2012), 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.[26] In

[24]Easton and Pae (2004) also show that on average the market rationally prices conservative accounting consistent with the valuation model in Feltham and Ohlson (1995), by examining the contemporaneous relation between accounting variables and returns.

[25]An alternative measure used by Bradshaw et al. (2012), 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).

[26]Consistent with prior studies, the *Conflict* variable is assigned a value of one if the brokerage firm's Carter-Manaster reputation ranking is 9, 0.5 if the ranking is between 0 and 8, and zero if the ranking is missing.

addition, we include intangible intensity as a control variable, because Amir et al. (2003) find that intangible intensity is positively associated with analysts' earnings forecast bias. Including this variable alleviates the concern that our conservatism-bias measure could reflect the firm's intangible intensity which may lead to bias due to a correlated omitted variable. Intangible intensity is measured as the sum of R& D and advertising expense of the previous three years divided by total assets at the beginning of the target price issuance year.

Table 5, Panel A, shows that the target price forecast error is positively related to the conservative-bias of year *t+1* (columns 1 and 3) and year *t+2* (columns 2 and 4). The positive association is observed for both measures of conservative-bias – actual as well as expected. Consistent with Frankel and Lee (1998), analysts' long-term growth forecast has a significant negative association and the book-to-market ratio has a significant positive association with target price forecast errors. The significant negative association with past returns suggests that analysts issue optimistic price targets when past performance has been strong (consistent with Clarkson, Nekrasov, Simon and Tutticci, 2012). The negative association between target-price forecast errors and return volatility is consistent with the argument in Das, Levine and Sivaramakrishnan (1998) that analysts issue optimistic forecasts for less predictable firms in order to facilitate the attainment of private information from managers. Inconsistent with our expectation, the variable *Conflict* is (weakly) positively associated with target price forecast errors. We conjecture that, because investment banking reputation ranking is a brokerage-level variable, it may not adequately capture analyst affiliation at the firm level. Consistent with Amir et al. (2003), intangible intensity has a weak negative association with target price forecast errors. Overall, the significant positive relation between target price forecast errors and Conservative-bias, after controlling for other factors that may affect forecast bias, suggests that analysts on average do not fully undo the conservative-bias in earnings when estimating target prices.

While thus far we have presented results for the average analyst, in the analysis that follows, we examine whether more sophisticated analysts are better at unraveling the conservative-bias from their target price forecasts. We use three 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, and (iii) general experience measured by the number of years an analyst appears in the I/B/E/S database from 1985 onward. The highest quintile 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 conservative-bias in EPS of years *t+1* or *t+2* (as in Table 5, Panel A) including the interaction of conservative-bias with the indicator variable for analyst sophistication.

Results based on the realized (actual) conservative-bias of the forecast year are reported in Panel B and those based on expected conservative-bias are reported in Panel C. From Panel B, we find that target prices of analysts in large brokerage firms, analysts with high firm-specific experience and analysts with high general experience have lower bias due to earnings conservatism of year *t+1* relative to other analysts. This is indicated by the negative coefficient estimates on the interaction terms. However, the differential coefficients are only weakly significant for the group of analysts with high firm-specific experience and with high general experience. Analysts with high firm-specific or general experience also undo part of the conservative-bias from their longer-term (year *t+2*) earnings forecasts; however, the same is not observed for analysts from large brokerage firms. Results based on expected conservative-bias using our naïve model reported in Panel C are in general weaker than those based on actual conservative-bias of the forecast year. In particular, from columns (3-4), analysts' ability to undo the expected conservative-bias in their earnings forecasts is not distinguishable based on their firm-specific experience.[27] Overall, it appears that more sophisticated analysts (correctly) adjust more of the conservative-bias relative to other analysts when arriving at their target price forecasts.[28]

[27]We also examine if analysts named as "All American" team analysts by *Institutional Investor* have a superior ability to undo the conservative-bias in their earnings forecasts when deriving their target prices. Unreported results show that All-American team analysts do not treat conservative-bias any differently from other analysts in arriving at their target price forecasts. The insignificant results could be because All-American team analysts form only 10.3% of our sample, which may reduce the power of the test.

[28]The reported coefficients on the interaction variables remain virtually unchanged when other control variables are also included in the regression (untabulated).

In relation to our results in Table 3, there may be a concern that the reason we obtain insignificant coefficient estimates on forecasted conservative-bias is because our proxies for forecasted conservative-bias are measured with error. Our results in Table 5 alleviate this concern by showing that analysts with greater sophistication and experience are better at adjusting the conservative-bias in their earnings forecasts when deriving target prices. If our measure of conservative-bias was simply reflecting noise, we would not see this consistent relationship between analyst ability and the adjustment of conservative-bias.

Collectively, our evidence in Tables 3 and 5 indicates that on average analysts fail to fully undo the conservative-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 largely unravels the conservative-bias in earnings when valuing a firm. Although the market rationally prices conservative accounting on average, it may be interesting to examine if distortions of stock price occur in some cases, especially for firms where the magnitude of conservative-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 in their earnings forecasts.

4.5 Market's assessment 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 mispricing occurs, we would expect to observe positive abnormal returns in subsequent periods when the information is revealed to investors. To examine this possibility, 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), 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 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 conservative-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 conservative-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 conservative-bias quintile. From Panel A, column (1), the coefficient estimate on *Q*(*TP/P*) for the highest quintile of conservative-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 excess 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 conservative-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 conservative-bias for these two groups (reported in row 1). The coefficient estimate on *Q*(*TP/P*) increases again for quintile 1, the lowest conservative-bias quintile, and is weakly significant. Note from row (1) that the mean conservative-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 conservative-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 excess 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 relatively low (*TP/P*) may not be clear to the market. On the other hand, from column (2), when conservative-bias is negative (reflecting investment in a declining stage), the negative correlation between (*TP/P*) and future returns is mainly attributed to the negative future excess returns earned by the high (*TP/P*) group. In this case, the negative conservative-bias leads to overestimation of the target price, and thus negative future excess 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.[29]

5. Concluding Remarks

This paper examines whether analysts, when using their earnings forecasts as inputs to obtain their target price forecasts, undo the conservative-bias in their earnings forecasts. Accounting conservatism affects the predictability of 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. Although some sophisticated analysts may use rigorous valuation models such as the DCF or the residual income valuation model and explicitly consider the effect of conservative-bias in deriving their target price forecasts, most analysts use valuation heuristics based on multiples, such as P/E, relative P/E, or the PEG ratio, to derive their target price forecasts. While analysts' earnings forecasts typically reflect "core" earnings after excluding non-recurring items, analysts' reports rarely (if ever) mention any adjustments made to their earnings forecasts for the effect of conservatism, say for the effect of changes

[29]The finding that our measure of conservative-bias serves as an indicator of predictable returns when coupled with target prices also validates our earlier contention that our measure of conservative-bias is not simply noise.

in R&D investment, when forecasting target prices.[30] Thus, it is quite likely that on average analysts' target price forecasts will not be fully adjusted for the conservative-bias in their earnings forecasts.

Our results show that, regardless of the valuation model/heuristic used, analysts on average fail to undo the conservative-bias in their earnings forecasts when estimating target prices. The evidence from this approach, which tracks the process used by analysts to derive target prices, is also corroborated by our finding that target price errors are systematically related to the level of conservative-bias. In addition, we find that more sophisticated analysts undo the conservative-bias to a greater extent relative to other analysts, although their target price estimates also exhibit substantial bias. While on average the market appears to correct for the effect of accounting conservatism when pricing firm earnings, we find evidence of some distortion of the market price for firms with extreme conservative-bias. We find that firms with relatively low target prices and a high level of conservative-bias earn positive future abnormal returns, whereas firms with high target prices and high negative conservative-bias earn negative future abnormal returns. Thus, it appears that, for extreme levels of conservative-bias, the market does not fully understand that analysts' target prices may be under/over-stated due to the conservative-bias incorporated in their own 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 conservative-bias in earnings forecasts. It appears then that target prices on average would have been even more optimistic if analysts had correctly adjusted the conservative-bias in their earnings forecasts. It is interesting to note, from our results, that when target prices are relatively *high* and conservative-bias is *high*, we do not observe significant future returns perhaps because the effect of conservative-bias cancels out the effect of

[30]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 08/24/09, "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.*" These historical 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, Fazzari and Petersen (2009).

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 conservative-bias in their earnings forecasts.

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 well-established 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 price forecasts when earnings are determined conservatively.

Appendix

Steady state example

Consider the following example of a firm in a steady state. The firm spends \$10 per share on R&D each year and there are no other expenses. The R&D expenditure is incurred evenly during the year. Each dollar of R&D generates \$1.2 dollars of sales spread evenly over the following five years which results in earnings of \$2.00 per share each year (\$10*1.2-\$10=\$2.00). 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. The R&D reserve each year equals \$25 per share: $R\&DRES_t = 0.9\times R\&D_t + 0.7\times R\&D_{t-1} + 0.5\times R\&D_{t-2} + 0.3\times R\&D_{t-3} + 0.1\times R\&D_{t-4}$, and Amortization of *R&D* asset = $R\&D_t/10 + R\&D_{t-1}/5 + R\&D_{t-2}/5 + R\&D_{t-3}/5 + R\&D_{t-4}/5 + R\&D_{t-5}/10$ = \$10 per share. (Note that the amortization is for half the year in Year 0 and Year 5 since the expenditure is incurred evenly during the year). Since sales are generated evenly over the following five years, they equal $1.2*(R\&D_t/10 + R\&D_{t-1}/5 + R\&D_{t-2}/5 + R\&D_{t-3}/5 + R\&D_{t-4}/5 + R\&D_{t-5}/10)$. The facts are summarized in the table below (all amounts are dollars per share).[31]

Year	0	1	2	3	4	5	6	7
Sales	12	12	12	12	12	12	12	12
R&D expense	10	10	10	10	10	10	10	10
NI	2	2	2	2	2	2	2	2
R&D reserve	25	25	25	25	25	25	25	25
Amortization of R&D	10	10	10	10	10	10	10	10
Unbiased Earnings	2	2	2	2	2	2	2	2

Suppose that in this simple case of a steady state, analysts correctly forecast one-year-ahead (Year 1) EPS of \$2.00 and use a steady-state P/E multiple of 10 (based on historical data) to make a target price forecast.[32] Then the target price equals \$20 (10*\$2).

[31]Unbiased Earnings equal net income plus the increase in R&D reserve or equivalently Sales minus Amortization of R&D.

[32]A P/E multiple of 10 can result from the present value calculation with zero abnormal earnings growth and a cost of equity of 10%.

Non-steady state example

Now consider a firm with the same data except that it has 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:

Year	0	1	2	3	4	5	6	7
Sales	12	12.12	12.24	12.24	12.24	12.24	12.12	12
R&D expense	10	11	10	10	10	10	10	10
NI	**2**	**1.12**	**2.24**	**2.24**	**2.24**	**2.24**	**2.12**	**2**
R&D reserve	25	25.9	25.7	25.5	25.3	25.1	25	25
Amortization of R&D	10	10.1	10.2	10.2	10.2	10.2	10.1	10
Unbiased Earnings	2	2.02	2.04	2.04	2.04	2.04	2.02	2

Suppose analysts incorporate the effect of accounting conservatism partially. Specifically, assume for simplicity that analysts' forecast of next-year (Year 1) earnings reflects 50% of the EPS decrease resulting in the forecast of \$1.56 (\$2.00+0.5*(\$1.12-\$2.00)). Suppose analysts use the same steady-state P/E multiple of 10 to make a target price forecast. Then the target price will drop from \$20 in the steady state example to \$15.6 in the non-steady state example (10*\$1.56). The lower target price is however biased since the firm value is higher in the non-steady state example (due to the increase in the positive present value investment in R&D).

Observation 1: The bias in the target price forecast arises not because analysts *miss* some amount of the change in conservative-bias in earnings (i.e., 50%), but because they *incorporate* some amount of the change in bias when making their earnings forecast. In fact, if they incorporate the full amount of the change in conservative-bias, although their earnings forecast will match reported earnings perfectly (\$2.00+(\$1.12-\$2.00)=\$1.12), their target price forecast will have an even greater downward bias (target price forecast will be \$1.12*10= \$11.2).

Observation 2: In order to eliminate the bias in the target price forecast, analysts must apply the steady-state P/E multiple to a forecast of unbiased earnings. In our example, applying a P/E multiple of 10 to Year 1 unbiased earnings of \$2.02 results in a value of \$20.20.

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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	43,739	0.0503	0.0487	0.0332
Two-year-ahead EPS	43,739	0.0642	0.0598	0.0330
12-month Target Price	43,739	1.2465	1.1962	0.3050
%Long-Term EPS Growth	15,008	0.1911	0.1600	0.1088
Analysts' Forecast Errors:				
One-year-ahead EPS	43,739	-0.0038	0.0005	0.0274
Two-year-ahead EPS	43,739	-0.0144	-0.0041	0.0581
12-month Target Price	43,739	-0.1518	-0.1390	0.5545
Actuals:				
Reported EPS	13,109	0.0420	0.0462	0.0552
Unbiased EPS	13,109	0.0477	0.0505	0.0588
Conservative-bias	13,109	0.0057	0.0013	0.0174

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. Conservative-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 (I/B/E/S) EPS plus conservative-bias. EPS numbers and conservative-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

Panel A: Results of regression of analysts' EPS forecasts on unbiased EPS and conservative-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)

Dependent variable:	**Conserv-bias (1)** $FEPS_{ijt+\tau}$		**Conserv-bias (2)** $FEPS_{ijt+\tau}$	
	(τ = 1)	(τ = 2)	(τ = 1)	(τ = 2)
	(1)	(2)	(3)	(4)
Intercept	0.030	0.062	0.029	0.048
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*
$UEPS_{it+\tau}$	0.454	0.130	0.442	0.321
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*
$Conserv\text{-}bias_{it+\tau}$	-0.409	-0.136	-0.403	-0.171
	(<0.001)	*(<0.001)*	*(<0.001)*	*(0.011)*
Adj-R^2	0.552	0.214	0.534	0.383
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Test of Difference:[a]				
$UEPS_{it+\tau}$ vs. $-Conserv\text{-}bias_{it+\tau}$	*(0.1439)*	*(0.8216)*	*(0.3754)*	*(0.0170)*
N	43,739	43,739	25,185	23,312

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

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

Dependent variable:	**Conserv-bias (1)** $FE_{ijt+\tau}$		**Conserv-bias (2)** $FE_{ijt+\tau}$	
	(τ = 1)	(τ = 2)	(τ = 1)	(τ = 2)
	(1)	(2)	(3)	(4)
Intercept	-0.007	-0.027	-0.013	-0.025
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*
$Conserv\text{-}bias_{it+\tau}$	-0.103	0.177	-0.138	-0.199
	(0.034)	*(0.335)*	*(0.077)*	*(0.087)*
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Adj-R^2	0.039	0.045	0.045	0.108

[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.

Table 2 continued…

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). In columns (1) and (2), $UEPS_{it+\tau}$ equals unbiased realized EPS of firm *i* for the year $t+\tau$. In columns (3) and (4), $UEPS_{it+\tau}$ equals expected unbiased EPS of firm *i* for the year $t+\tau$, where the expectation is taken at date *t* based on a naïve random walk model. Conserv-$bias_{it+\tau}$ (1) equals conservative-bias in realized EPS of firm *i* for the year $t+\tau$. Conserv-$bias_{it+\tau}$ (2) equals expected conservative-bias in EPS of firm *i* for the year $t+\tau$, where the expectation is taken at date *t* based on a second-order autoregressive process. $FE_{ijt+\tau}$ equals (signed) 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 forecasted EPS and the conservative-bias component of the forecast:

$$TP_t = \beta_0 + \beta_1 FEPS_{t+1} + \beta_2 FConserv\text{-}bias_{t+1} + \omega_t \qquad (2)$$

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

	FConserv-bias (1)		**FConserv-bias (2)**	
Variables	Pooled (1)	By Industry (2)	Pooled (3)	By Industry (4)
Intercept	1.160	1.114	1.082	1.122
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*
$FEPS_{t+1}$	3.908	3.646	3.682	3.010
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*
$FConserv\text{-}bias_{t+1}$	0.212	-0.557	-0.904	-1.836
	(0.869)	*(0.673)*	*(0.429)*	*(0.831)*
Adj-R^2 / Avg R^2	0.247	0.260	*0.233*	*0.233*
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	No	Yes	No
N	43,739	32	23,617	28

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

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

$$TP_t = \beta'_0 + \beta'_1 FEPS_{t+1} + \beta'_2 FConserv\text{-}bias_{t+1} + \beta'_3 AGR_{t+2} + \beta'_4 AGRConserv\text{-}bias_{t+2} + \upsilon'_t \quad (6)$$

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

	FConserv-bias (1) (N=15,008)			**FConserv-bias (2)** (N=8,043)		
Variables	Reg (5)	Reg (6) r = 10%	Reg (6) r = FF	Reg (5)	Reg (6) r = 10%	Reg (6) r = FF
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	1.194	1.050	1.040	1.170	1.031	1.031
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*
$\Delta FEPS_{t+2}$	13.199			12.707		
	(<0.001)			*(<0.001)*		
$\Delta FConserv\text{-}bias_{t+2}$	-0.080			-1.796		
	(0.912)			*(0.207)*		
$FEPS_{t+1}$		3.999	4.180		4.007	4.222
		(<0.001)	*(<0.001)*		*(<0.001)*	*(<0.001)*
$FConserv\text{-}bias_{t+1}$		1.481	1.330		-0.876	-1.313
		(0.250)	*(0.279)*		*(0.587)*	*(0.409)*
AGR_{t+2}		7.957	8.025		6.781	6.556
		(<0.001)	*(<0.001)*		*(<0.001)*	*(<0.001)*
$AGRConserv\text{-}bias_{t+2}$		0.657	0.691		-0.671	-0.735
		(0.279)	*(0.245)*		*(0.595)*	*(0.559)*
Adj-R^2	0.230	0.303	0.307	0.183	0.273	0.275
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	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: TP_t equals the forecasted date-*t* target price issued by an analyst at date *t-1*. $FConserv\text{-}bias_{t+\tau}$ equals the conservative-bias component of the analyst's EPS forecast for the year $t+\tau$, estimated from the first-stage regression (1) of the EPS forecast on the unbiased component and the conservative-bias component of EPS of the forecast year interacted with industry dummies. FConserv-bias (1) indicates tests based on the realized value of conservative-bias, and FConserv-bias (2) indicates tests based on the expected value of conservative-bias. $FEPS_{t+\tau}$ is the EPS forecast for year $t+\tau$. $AGR_{t+2} = FEPS_{t+2} + rFDPS_{t+1} - (1+r)FEPS_{t+1}$ is the abnormal growth in earnings, $FDPS_{t+1}$ equals the forecasted dividend for year *t+1* based on a constant payout ratio equal to the actual payout ratio in year *t-1*, and $AGRConserv - bias_{t+2} = FConserv - bias_{t+2} - (1+r)FConserv - bias_{t+1}$ is the conservative-bias component of AGR_{t+2}. In columns (2) and (5), the expected rate of return, *r*, is assumed to be a constant 10%, and, in columns (3) and (6), *r* is estimated using the Fama-French three-factor model at the industry-level. All regression variables are scaled by the closing price three days prior to the target price release date.

Table 4
Effect of conservative-bias in subsequent earnings on actual prices – Results of regression of actual prices on realized and expected subsequent EPS and conservative-bias in subsequent EPS

Dependent variable is actual prices

Variables	**Conserv-bias (1)**		**Conserv-bias (2)**	
	(1)	(2)	(3)	(4)
N	8,902	8,744	6,693	6,266
Intercept	0.918	0.952	0.778	0.716
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*
EPS_{t+1}	5.057			
	(<0.001)			
$FEPS_{t+1}$			5.821	
			(<0.001)	
Conserv-$bias_{t+1}$	2.602		3.266	
	(<0.001)		*(<0.001)*	
EPS_{t+2}		3.691		
		(<0.001)		
$FEPS_{t+2}$				5.749
				(<0.001)
Conserv-$bias_{t+2}$		2.804		1.579
		(<0.001)		*(0.015)*
Adj-R^2	*0.361*	*0.335*	*0.320*	*0.368*
Year Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*
Industry Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*

[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 regressions with actual price at the end of twelve months following the target price release month (*P12*) as the dependent variable, and the two subsequent years' realized EPS and conservative-bias (1) in columns (1-2) and forecasted EPS and conservative-bias (2) in columns (3-4) as the independent variables. Other variables are defined in Table 2.

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

Panel A: Results of regression of analysts' target price forecast errors on conservative-bias of forecast years with control variables

Dependent variable is target price forecast error

Variables	**Conserv-bias (1)**		**Conserv-bias (2)**	
	(τ = 1)	(τ = 2)	(τ = 1)	(τ = 2)
	(1)	(2)	(3)	(4)
Intercept	-0.013	0.196	0.050	0.250
	(0.755)	*(<0.001)*	*(0.401)*	*(<0.001)*
Conserv-bias$_{t+\tau}$	3.140	4.094	2.219	4.204
	(<0.001)	*(<0.001)*	*(0.011)*	*(<0.001)*
Intangible Intensity	-0.039	-0.015	-0.027	-0.014
	(0.096)	*(0.539)*	*(0.477)*	*(0.752)*
Conflict	0.009	0.013	-0.003	-0.005
	(0.150)	*(0.082)*	*(0.729)*	*(0.600)*
Long-Term Growth	-0.015	-0.018	-0.023	-0.015
	(0.047)	*(0.031)*	*(0.044)*	*(0.246)*
Book-to-Market	0.038	0.066	0.041	0.065
	(0.106)	*(0.010)*	*(0.232)*	*(0.097)*
Size	-0.006	-0.015	-0.017	-0.022
	(0.123)	*(<0.001)*	*(0.001)*	*(<0.001)*
Past Returns	-0.038	-0.044	-0.033	-0.040
	(<0.001)	*(<0.001)*	*(0.005)*	*(0.002)*
Return Volatility	-0.072	-0.073	-0.066	-0.069
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*
Adj-R^2	0.203	0.228	0.185	0.206
Year Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*
Industry Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*
N	41,751	32,549	23,335	17,740

Table 5 continued…

Panel B: Effect of analyst sophistication on the relation between analysts' target price forecast errors and conservative-bias of forecast years using Conserv-bias (1)

Dependent variable is target price forecast error

Variables	**Brokerage size**		**Firm-Level Experience**		**General Experience**	
	(τ = 1)	(τ = 2)	(τ = 1)	(τ = 2)	(τ = 1)	(τ = 2)
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.300	-0.483	-0.447	-0.451	-0.452	-0.454
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*
High Group	0.043	0.041	0.038	0.043	0.011	0.014
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(0.048)*	*(0.026)*
Conserv-bias$_{t+\tau}$ (1)	3.255	4.103	3.653	5.219	3.213	4.508
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*
Conserv-bias$_{t+\tau}$ (1) *High Group	-1.863	-0.032	-0.705	-1.684	-0.656	-0.852
	(0.056)	*(0.957)*	*(0.093)*	*(<0.001)*	*(0.075)*	*(0.036)*
Adj-R^2	0.173	0.201	0.181	0.208	0.176	0.2
Year Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

Panel C: Effect of analyst sophistication on the relation between analysts' target price forecast errors and conservative-bias of forecast years using Conserv-bias (2)

Dependent variable is target price forecast error

Variables	**Brokerage size**		**Firm-Level Experience**		**General Experience**	
	(τ = 1)	(τ = 2)	(τ = 1)	(τ = 2)	(τ = 1)	(τ = 2)
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.342	-0.327	-0.315	-0.299	-0.312	-0.298
	(<0.001)	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*	*(<0.001)*
High Group	0.036	0.032	0.007	-0.001	-0.003	-0.002
	(<0.001)	*(<0.001)*	*(0.381)*	*(0.940)*	*(0.716)*	*(0.771)*
Conserv-bias$_{t+\tau}$ (2)	2.285	3.416	1.076	2.897	1.430	3.323
	(0.009)	*(<0.001)*	*(0.128)*	*(0.001)*	*(0.057)*	*(<0.001)*
Conserv-bias$_{t+\tau}$ (2) *High Group	-1.583	-0.672	0.018	-0.013	-1.113	-1.295
	(0.066)	*(0.497)*	*(0.983)*	*(0.990)*	*(0.151)*	*(0.171)*
Adj-R^2	0.181	0.205	0.18	0.204	0.18	0.205
Year Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

Table 5 continued…

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. *Intangible Intensity* equals R&D and Advertising expense summed over the previous three years divided by total assets at the beginning of the target price issuance year. *Conflict* is the Carter-Manaster investment-banking reputation ranking of brokerage firms coded as 1 for high rank, 0.5 for low rank, and zero for negative or missing rank. *Long-Term Growth* is the analyst's long-term growth forecast issued within a period of three months following the previous year's earnings announcement. *Book-to-Market* is the ratio of book value of equity to market value of equity at the beginning of the target-price issuance year. *Firm Size* is the log of market value of equity at the beginning of the target price issuance year. *Past Returns* equal the stock returns of the previous year. *Return Volatility* equals the standard deviation of daily returns of the previous year multiplied by 100. In Panels B and C, "High Group" is an indicator variable that equals one for the highest quintile of analysts ranked by the proxy for analyst sophistication, i.e., brokerage firm size in columns (1-2), firm-specific experience in columns (3-4), and general experience in columns (5-6). 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 (6) of future returns on target prices and control variables:

$$R_{t+1} = \psi_0 + \psi_1 Q(TP/P) + \psi_2\beta + \psi_3 Size + \psi_4 B/M + \psi_5 R_t + \eta_{t+1} \quad (6)$$

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	0.027	0.028	0.046	0.033	0.042

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	0.027	0.042

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*.