Abnormal Returns Implicit in Cost of Capital Estimates Based on Analyst Forecasts

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1. Introduction

In this paper, we compare the expected rate of return implied by market prices, book value of common equity, and realized accounting earnings with the expected rate of return implied by market prices, book value of common equity, and analysts' forecasts of earnings.

All of our analyses are based on two methods for simultaneously estimating the expected rate of return and the expected growth rate for a portfolio/group of stocks. The estimate of the expected growth rate is not important in and of itself but estimating it simultaneously with the estimation of the expected rate of return avoids the introduction of error which will almost inevitably arise when the expected growth rate is assumed: any assumed growth rate will almost invariably differ from the growth rate implied by the data.[1]

Analysts are in the business of identifying stocks with an expected rate of return that differs from the cost of capital; that is, they search out stocks that they feel are mispriced and therefore will earn an abnormal return. This suggests that the estimates of the expected rate of return based on their forecasts will be over/under-estimates of the cost of capital unless they recommend (at least implicitly) "hold". We compare the estimate of the expected rate of return that is implied by prices and current accounting data (this is implicitly the markets' expectation) with estimates that are based on prices, current book value, and analysts' forecasts, which have varying degrees of optimism/pessimism as captured in buy/hold/sell recommendations.

Our method for estimating the expected rate of return that is implied by prices and current accounting data is an adaptation of the method that O'Hanlon and Steele (2000) use to estimate the expected market equity premium for the U.K. Our method for estimating the expected rate of return that is implied by prices, current book values and forecasts of earnings is

[1] See Easton (2005) for a detailed discussion of this source of error.

an adaptation of the method that Easton, Taylor, Shroff, and Sougiannis (2002) use to estimate the equity premium in the U.S.

Most of the extant literature uses market prices, book values, and analysts' forecasts to obtain estimates of the implied expected rate of return. These estimates consist of two components -- analysts' expectations of normal returns (the cost of capital) and analysts' expectations of abnormal returns.[2] On the other hand, the O'Hanlon and Steele (2000) method compares market prices with accounting fundamentals (earnings and book values): if the market prices are efficient, the implied expected rate of return based on this method is equal to the cost of capital. In light of this argument, it is not clear why researchers would use analysts' forecasts since the forward looking aspect (the forecast) is implicit in market prices. The choice rests on whether the estimate based on (possibly inefficient) prices and accounting fundamentals is superior to that obtained using (possibly inefficient) prices and analysts' forecasts, which may differ from the market's expectations. Superiority of a method based on accounting fundamentals seems likely in view of the key reason why analysts make forecasts – they form the basis of recommendations which (importantly) are rarely "hold".

We use the method designed by Easton, Taylor, Shroff, and Sougiannis (2002) to determine the expected rate of return and the expected growth rate implied by market prices, accounting book value, and forecasts of earnings. These estimates implicitly include both analysts' expectations about abnormal returns (which are, presumably, the basis for their stock recommendations) and normal returns related to the risk of the firm. These recommendations

[2] It seems reasonable to assume that an analyst issuing a "buy" recommendation is making this recommendation based on the expectation that there will be a positive abnormal return (that is, a return greater than the cost of capital). Cost of capital is an equilibrium concept that relies on the no arbitrage assumption. In the absence of arbitrage opportunities, the markets expected rate of return is equal to the cost of capital. The estimate of the expected rate of return implied by prices and analysts' forecasts of earnings, however, may not be equal to the market's expected rate of return.

range from "strong buy" through "hold" to "sell". In principle, a "hold" recommendation implies that the analyst making the recommendation expects the stock to earn just a normal return. Allegations in the popular press and studies such as Michaely and Womack (1999) question this expectation. We use the Easton, Taylor, Shroff, and Sougiannis (2002) method to determine the expected rate of return implied by forecasts accompanied by recommendations of each type and compare these with the expected rate of return implied by realized earnings.

A rapidly growing literature uses analysts' forecasts of earnings as a basis for estimating the implied expected rate of return. We show that, on average, this estimate is 2.64 percent higher than the estimate that is not affected by the bias in analysts' forecasts and there are some years when the difference is quite large (approximately four percent). These results are not surprising in view of the fact that analysts' are in the business of making stock recommendations and their recommendations tend to be "buy" rather than "sell". An implication of the observation that analysts tend to forecast positive abnormal returns is that caution should be taken when interpreting the meaning of the expected rate of return that is implied by analysts' earnings forecasts: it is not, as the literature generally claims, an estimate of the cost of capital.

The literature that reverse-engineers valuation models to obtain estimates of the expected rate of return on equity investment is very new. These reverse-engineered valuation models include the dividend capitalization model (see, Botosan (1997)), the residual income valuation model (see, O'Hanlon and Steele (2000), Gebhardt, Lee, and Swaminathan (2001), Claus and Thomas (2001), Easton, Taylor, Shroff, and Sougiannis (2002), and Baginski and Wahlen (2003)), and the abnormal growth in earnings model (see, Gode and Mohanram (2003) and Easton (2004)). A literature that has used these estimates to test hypotheses regarding factors that may affect the expected rate of return has developed almost simultaneously (see, for

example, Daske (2005), Dhaliwal, Krull, Li, and Moser (2005), Francis, Khurana, and Periera (2005), Francis, LaFond, Olsson, and Schipper (2003), Hail and Leuz (2005), Hribar and Jenkins (2004), and Lee, Myers, and Swaminathan (1999)) This has happened despite the facts that (1) some of these methods were not designed to provide firm-specific estimates (see, in particular, Claus and Thomas (2001), Easton, Taylor, Shroff, and Sougiannis (2002), and Easton (2004)), and (2) there is very little evidence regarding the empirical validity of these methods.

The conclusion from the very recent studies that examine the validity of firm-specific estimates of expected rate of return that are derived from these reverse-engineering exercises (Botosan and Plumlee (2005), Guay, Kothari and Shu (2005), and Easton and Monahan (2005)) is that these estimates are poor, indeed. None of the studies address the issue of potential bias in the estimate of the expected rate of return. Nevertheless, it is possible that bias in analysts' forecasts of earnings is a correlated omitted variable that could affect the results in studies that compare estimates of the implied expected rate of return on equity capital. It is possible, for example, that analysts' forecasts for firms under one accounting regime (say, accounting based on international accounting standards) may reflect their expectations of larger abnormal returns than analysts' forecasts for firms under a different accounting regime (say, accounting based on domestic standards). These optimistic forecasts will bias the estimate of the expected rate of return upward, potentially leading to the (possibly erroneous) conclusion that the cost of capital is higher for these firms.

All studies that invert either the residual income valuation model or the abnormal growth in earnings model rely on forecasts of earnings that are made by sell-side analysts who are in the business of making buy/hold/sell recommendations. It seems reasonable to assume that analysts making buy (sell) recommendations are implicitly forecasting a positive (negative) abnormal

return – that is, they are forecasting a rate of return that will be more (less) than the cost of capital.[3] In light of analysts' tendency to be optimistic, these estimates of the expected rate of return are likely to be generally higher than the cost of capital. Williams (2004) makes this point in his discussion of Botosan, Plumlee, and Xie (2004). This effect of analysts' optimism is exacerbated by the fact that all studies that use analysts' forecasts to calculate an implied expected rate of return use forecasts that are made well in advance (usually at least a year) of the earnings announcement. These forecasts tend to be much more optimistic than those made closer to the earnings announcement (see Richardson, Teoh, and Wysocki (2001)).

All of our analyses are based in I/B/E/S forecasts of earnings for the years 1994 to 2004 and actual prices and accounting data for 1993 to 2003. Consistent with the extant literature, the forecasts tend to be optimistic.

The difference between the estimate of the expected rate of return obtained from the Easton, Taylor, Shroff, and Sougiannis (2002) method using analysts' forecasts of earnings and the estimate obtained from the O'Hanlon and Steele (2000) method based on current accounting data is an estimate of the analysts' expectation of the abnormal rate of return. On average, this is 2.64 percent but there are some years when it is quite large (for example, for the sample of stocks in 1994, the estimate of the abnormal return is almost four percent). These results are not surprising in view of the fact that analysts are in the business of making stock recommendations and their recommendations tend to be "buy" rather than "sell".

Results from sub-samples formed on the basis of recommendation type (either based on the percentage of analysts recommending buy or on individual analyst recommendations), show that as the analysts' recommendation changes from "strong buy" to "sell", the estimate of the

[3] While it is reasonable to expect that the level of the analyst's recommendation should be associated with *expected* abnormal returns, it should be noted that Bradshaw (2004) finds analysts' recommendations uncorrelated with future *realized* abnormal returns.

expected rate of return declines. Nevertheless, a comparison of the estimates of the expected rate of return based on the analysts' forecasts with the estimates based on current accounting data suggests a positive abnormal return for all recommendation types – that is, analysts' tend to be more optimistic than the market even when they are not making buy recommendations.

2. Methods of estimating the implied expected rate of return

The majority of the analysis in this paper compares estimates of the expected rate of return implied by prices, book value, and forecasts of earnings (based on the method in Easton, Taylor, Shroff, and Sougiannis (2002)) with the estimates of the expected rate of return implied by prices, book values, and realized earnings (based on the method in O'Hanlon and Steele (2000)). Both of the methods are based on the residual income valuation model which may be written as follows:

$$v_{jt} \equiv bps_{jt} + \sum_{\tau=1}^{\infty} \frac{eps_{jt+\tau} - r_j \times bps_{jt+\tau-1}}{(1+r_j)^{\tau}} \qquad (1)$$

where v_{jt} is the intrinsic value per share of firm j at time t, bps_{jt} is the book value per share of common equity of firm j at time t, eps_{jt} is the earnings per share of firm j at time t and r is the cost of capital for firm j. Easton, Taylor, Shroff, and Sougiannis (2002) rely on the following finite horizon version of this model:

$$p_{jt} \equiv bps_{jt} + \frac{eps_{jt+1} - r_j \times bps_{jt}}{(r_j - g_j)} \qquad (2)$$

where p_{jt} is price per share for firm j at time t, and g_j is the expected rate of growth in residual income beyond period t+1 required to equate ($p_{jt} - bps_{jt}$) and the present value of an infinite residual income stream.[4]

The method in O'Hanlon and Steele (2000) is based on the following form of the residual income valuation model:

$$p_{jt} \equiv bps_{jt} + \frac{\left(eps_{jt} - r_j \times bps_{jt-1}\right)\left(1 + g'_j\right)}{\left(r_j - g'_j\right)} \qquad (3)$$

The major difference between this form of the model and the form used by Easton, Taylor, Shroff, and Sougiannis (2002) is that g'_j is the perpetual growth rate starting from *current residual income* (that is, time t) that implies a residual income stream such that the present value of that stream is equal to the difference between price and book value, whereas in Easton, Taylor, Shroff, and Sougiannis (2002), g_j is the perpetual growth rate starting from *next-period residual income* (that is, time t+1) that implies a residual income stream such that the present value of that stream is equal to the difference between price and book value).

2.1. Estimation based on prices, book value and earnings forecasts

Easton, Taylor, Shroff, and Sougiannis (2002) transform equation (2) to form the following regression relation:

$$\frac{eps_{jt+1}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p_{jt}}{bps_{jt}} + \mu_{jt} \qquad (4)$$

where $\gamma_0 = g$, $\gamma_1 = r - g$.[5] This regression may be estimated for any group/portfolio of stocks to obtain estimates of the expected rate of return, r, and the expected growth rate, g, for the

[4] In Easton, Taylor, Shroff, and Sougiannis (2002) the period t to t+1 is 4 years so that eps_{jt+1} is aggregate expected cum-dividend earnings for the four years after date t, that is, $aggearn_{jt+1}/bps_{jt}$. We use a one-year forecast horizon instead of four years in order to facilitate more effective use of the data on analysts' recommendations.

portfolio. Easton, Taylor, Shroff, and Sougiannis (2002) run this regression for a sample of U.S. stocks to obtain an estimate of the expected rate of return on the U.S. equity market and hence an estimate of the equity premium for that market.

2.2. Estimation based on current accounting data

O'Hanlon and Steele (2000) transform equation (3) to form the following regression relation:[6]

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \zeta_{jt} \qquad (5)$$

where $\delta_0 = r$, $\delta_1 = (r - g')/(1 + g')$. This regression may be estimated for any group/portfolio of stocks to obtain estimates of the expected rate of return, *r,* and the expected growth rate, g', for the portfolio. O'Hanlon and Steele (2000) run this regression for a sample of UK stocks to obtain an estimate of the expected rate of return on the UK equity market and hence an estimate of the equity premium for that market.

3. Description of the data

All earnings forecast and recommendation data are obtained from the I/B/E/S research data bases. We use median estimates in the last month of the fiscal year (computed by I/B/E/S

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[5] At the firm-specific level, the following relation between the regression variables: $\frac{eps_{jt+1}}{bps_{jt}} = \gamma_{0j} + \gamma_{1j} \frac{p_{jt}}{bps_{jt}}$, is readily obtained by rearranging the identity shown in equation (3). In the re-expression of this relation for a group of observations (as in equation (4)) as a regression relation, the coefficients γ_0 and γ_1 represent an average of the firm-specific γ_{0j} and γ_{1j} coefficients and the cross-sectional variation in these coefficients creates the regression residual. Easton, Taylor, Shroff, and Sougiannis (2002) describe this regression in more detail pointing out that it involves the implicit assumption that it has the properties of a random coefficient regression.

[6] We attribute this model to O'Hanlon and Steele (2000) because they capture its essential elements. The similarity to their model may not, however, be immediately apparent. Since the derivation in O'Hanlon and Steele (2000) is based on Ohlson (1989), the observation that the regression intercept is an estimate of the implied expected rate of return is not evident and O'Hanlon and Steele (2000) do not use it in this way. Rather, they estimate the implied expected rate of return at the firm-specific level by applying their model to time-series data and then measuring the risk premium as the slope of the Securities Market Line estimated from a regression of these firm-specific rates of return on corresponding beta estimates.

from the available analysts' forecasts as of the third Thursday of the month) as the consensus forecast taken from the unadjusted summary database.

For some tests, the consensus recommendations are paired with the percentage of buy recommendations (recommendation code equals 1 or 2) in that month taken from the summary recommendations database. For the tests using detail forecasts, the last forecast of earnings (median if multiple forecasts on that day) in the last month of the fiscal year and the analyst code are taken from the unadjusted detail database. Detail forecasts are paired with the most recent recommendation by that analyst based on recommendations dates, analyst codes and recommendation codes[7] gathered from the detail recommendations database. The forecast errors are computed as the analyst forecast less the I/B/E/S actual earnings per share from the unadjusted actual database.

Income before extraordinary items, price at fiscal year-end, dividends per share, preferred dividends, extraordinary items and discontinued operations, common equity, common shares outstanding, and common shares used for diluted earnings per share are obtained from the CRSP/COMPUSTAT quarterly merged database.

As we require the dates of forecasts from the detail database to identify the single most recent forecasts, we limit the time period to the period beginning in 1993 to ensure the dates can be relied upon.[8] We delete firms with non-December fiscal year-ends so that the market implied

[7] I/B/E/S uses a standard set of recommendation codes with values of 1≡Strong Buy, 2≡Buy, 3≡Hold, 4≡Underperform and 5≡Sell.

[8] Zitzewitz [2002, p. 16] describes the importance of not relying on forecast dates in the I/B/E/S database prior to 1993 as follows:

> "I/B/E/S dates forecasts using the date it was entered into the I/B/E/S system. It has been well documented (e.g., by O'Brien, 1988) that the lags between a forecast becoming public and its entry into the I/B/E/S system were substantial in the 1980s (i.e., up to a month). In the 1980s, analysts mailed their forecasts, often in monthly batches, to I/B/E/S where they were hand entered into the system. Since 1991-92, however, almost all analysts have entered their forecasts directly into the I/B/E/S system on the day they wish to make their forecast widely available (Kutsoati and Bernhardt, 1999). Current practice for analysts is now usually to publicly release forecasts within 24 hours of providing them to clients. I/B/E/S analysts

discount rate and growth rate are estimated at the same point in time for each firm-year observation. For each set of tests, firms with any of the dependent or independent variables for that year in the top or bottom one percent of observations are removed to reduce the effects of outliers.

For observations in 1995, for example, the summary tapes for December include forecasts and recommendations made up through the 21st day of the month. From these data, we get the earnings forecast for 1996 and the current percentage of buy recommendations. We also gather the most recent (up to December 31, 2005) individual analyst forecast for 1996 and associate it with the most recent recommendation code by that analyst.

4. Results

We begin by documenting the accuracy (that is, the mean/median *absolute* earnings forecast error) and the bias (that is, the mean/median earnings forecast error) in the earnings forecasts for the entire sample of stocks. Second, we compare the estimate of the expected rate of return implied by prices, book values, and analysts' forecasts of earnings with the estimate obtained from prices, book values, and actual current earnings. This comparison provides an indication of the extent to which prior literature that is based on these expectations may have over/under-estimated the cost of capital.

We then repeat each of these analyses for sub-samples of observations for which the consensus has varying degrees of "buy" recommendations – ranging from the sub-samples for which greater than 90 percent of the analysts recommend "buy" to the sub-sample for which less

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have real-time access to each other's forecasts through this system, so an analyst entering a forecast into the system on Wednesday knows about forecasts entered on Tuesday and could potentially revise her forecast to incorporate their information. An additional advantage of the post-92 data is the shift from retrospective data entry by a specialist to real-time data entry by either the analyst or her employee should have considerably reduced data-entry related measurement error."

than or equal to 10 percent of the analysts recommend "buy". To the extent we find estimates of expected rate of return based on earnings forecasts and estimates based on actual current earnings that are very similar, we are able to identify sub-samples of forecasts that may more reasonably be used to estimate the cost of capital.

Further, all analyses are repeated for sub-samples where the forecasts are accompanied by each type of analyst recommendation (classified as "strong buy, buy, hold, underperform, and sell"). The comparison of the estimates of the expected rate of return based on the forecasts with the estimates (for the same sample) based on actual current earnings provides evidence of the extent to which analysts are providing recommendations based on expected rates of return that differ from the market's expectations. These analyses permit further calibration of the extent to which sub-samples may be used as estimates of the cost of capital – in other words, these analyses help in finding sub-samples for which the analysts are seemingly forecasting zero abnormal returns.

Finally, we repeat the comparisons of each of the estimates of the expected rates of return for sub-samples of observations where we have different recommendations (by different analysts) for the same set of firm-year observations. Here we have a perfect match on all firm and risk characteristics since we compare two observations for the same firm-year where the pair of analysts has differing expected abnormal returns.

4.1. Accuracy and bias in the analysts' forecasts of earnings

Table 1 summarizes the accuracy and the bias in the I/B/E/S consensus forecast of earnings for each of the years 1993 to 2003.

We use the mean (median) absolute forecast error as the measure of accuracy. The mean absolute forecast error ranges from \$0.568 in 1996 to \$1.292 in 2000 and the median absolute

forecast error ranges from $0.220 in 2002 and 2003 to $0.450 in 2000. In order to give some indication of the scale of these errors, we also present the mean and the median absolute forecast error deflated by end-of-year price. The mean absolute price-deflated forecast error ranges from 0.024 in 2003 to 0.094 in 2000 and the median absolute price-deflated forecast error ranges from 0.011 in 2003 to 0.027 in 2000.

We use the mean (median) forecast error as the measure of bias in the analysts' forecasts. The mean forecast error ranges from -$1.120 in 2000 to $-0.004 in 2001 and the median forecast error ranges from -$0.350 in 1997 to -$0.050 in 2003. The mean price-deflated forecast error ranges from -0.061 in 2000 to -0.005 in 2003 and the median price-deflated forecast error ranges from -0.019 in 2000 to -0.002 in 2003. These predominantly negative forecast errors are consistent with the prior literature, which concludes that analysts' forecasts, particularly long-run forecasts, tend to be optimistic (see, for example, O'Brien (1993), Lin (1994), and Richardson, Teoh, and Wysocki (2001)).

4.2. Description of regression variables

The number of observations used to estimate the annual regressions ranges from 2,034 in 1993 to 2,991 in 1997. As shown in table 2, the mean price-to-book ratio, which is the independent variable in regression (4) ranges from 2.097 at the end of 2002 to 3.350 at the end of 1999 while the median price-to-book ratio ranges from 1.689 in 2002 to 2.428 in 1997. This regression is run with the forecasted return-on-equity based on the I/B/E/S consensus forecast as the dependent variable. The mean forecasted return-on-equity ranges from 0.077 in 2001 to 0.164 in 1995 and the median forecasted return-on-equity ranges from 0.113 in 2001 to 0.155 in 1994, 1995 and 1997.

The annual mean and median current return-on-equity (the dependent variable in regression (5)) is generally a little less than the corresponding mean and median forecasted return-on-equity. The mean current return-on-equity ranges from 0.063 in 2001 to 0.149 in 1995 and the median current return-on-equity ranges from 0.100 in 2001 to 0.149 in 1995. The mean of the independent variable in this regression (the different between price and current book value deflated by lagged book value) ranges from 1.243 in 2002 to 3.361 in 1999 and the median ranges from 0.718 in 2002 to 1.640 in 1997.

4.3. Comparison of implied expected rates of return based on I/B/E/S forecasts of earnings with implied expected rate of return based on current accounting data

In this section, we compare the estimates of the implied expected rates of return using the method in Easton, Taylor, Shroff, and Sougiannis (2002) using one-year ahead I/B/E/S consensus forecasts of earnings (regression (4)) with the estimates obtained from the method in O'Hanlon and Steele (2000) which is based on current earnings and current and lagged book value (regression (5)). The estimates based on analysts' forecasts include the analysts' estimate of both the normal and the abnormal expected rate of return while the estimates based on actual accounting data provide an indication of the market's expected rate of return. Arguably, the difference between the two estimates is the analysts' estimate of abnormal return that would accrue from investing in the stock and provides a basis for their stock recommendation.

4.3.1. The expected rate of return implied by analysts' earnings forecasts

The summary statistics from regression (4) where the dependent variable is I/B/E/S forecasted return-on-equity are included in table 3. We provide year-by-year estimates of the regression coefficients and t-statistics for tests of their difference from zero. Since these statistics may be over-stated due to the possibility of correlated residuals, we also present the mean coefficient estimates and the related Fama and MacBeth (1973) t-statistics. The regression

adjusted R^2 ranges from 1.98 percent in 1999 to 14.46 percent in 1993.[9] The mean estimate of the intercept coefficient $\gamma_{0,}$ which is an estimate of the implied growth in residual income beyond the one-year forecast horizon, is 0.077 (t-statistic of 8.52) and the mean estimate of the slope coefficient $\gamma_{1,}$ which is an estimate of the difference between the implied expected rate of return and the implied growth in residual income beyond the one-year forecast horizon, is 0.022 (t-statistic of 8.38).

The estimates of the implied expected rate of return obtained from the estimates of the regression (4) coefficients where the dependent variable is analysts' forecasts of return-on-equity, are also included in table 3. These estimates range from 5.23 percent in 2001 to 13.43 percent in 1999 with a mean (t-statistic) of 9.97 percent (12.52).[10]

4.3.2. The expected rate of return implied by current accounting data[11]

The summary statistics from regression (5) are also included in table 3. The regression adjusted R^2 ranges from 0.86 percent in 1999 to 16.46 percent in 1994.[12] The mean estimate of

[9] When we remove the top and bottom three percent of observations (rather than the top and bottom one percent) the explanatory power of these regressions increases such that the range is from a low of 4.39 percent in 2001 to a high of 30.10 percent in 1995.

[10] When we remove the top and bottom three percent of observations (rather than the top and bottom one percent) the estimates of the implied expected rates of return range from range from 6.31 percent in 2001 to 13.50 percent in 1999 with a mean (t-statistic) of 10.56 percent (14.38).

[11] The framework, which is based on current accounting data in the O'Hanlon and Steele (2000), equation (3), matches price to contemporaneous accounting data. Accordingly, we match year-end price with accounting data for the year. Implicitly, this match captures the idea that both price and the accounting data capture the same underlying information. Year-end price, however, does not reflect the year's earnings because the accounting earnings are not reported until a later date. In order to examine the sensitivity of the results to this issue, we also repeat the analyses based on equation (4) using price plus dividends three months after fiscal-year end (that is, at the end of the subsequent quarter) and then discount back to year end. Since the discounting of price requires the expected rate of return we are attempting to capture in equation (4), we use an iterative method (as in Easton, Taylor, Shroff, and Sougiannis (2002)). We begin these iterations by assuming a discount rate for prices of 12 percent. We run the regression and obtain an estimate of the expected rate of return which we then use as the new rate for discounting prices. We then re-run the regression to re-estimate equation (4) and provide another estimate of expected return. This procedure is repeated until the estimate of the expected rate of return and the rate used in discounting price converge. This iterative process is repeated until none of the annual estimates changes by more than 0.0001%. In our samples, the annual estimates usually converged in 5-6 iterations. The results based on these alternative prices are qualitatively very similar to the results based on year-end prices.

the intercept coefficient $\delta_{0,}$ which is an estimate of the implied expected rate of return, is 0.073 (t-statistic of 10.65) and the mean estimate of the slope coefficient $\delta_{1,}$ which is a function of the expected rate of return and the expected growth in residual income, is 0.020 (t-statistic of 6.35). The estimates of the implied expected rate of return are also included in table 3. These estimates range from 3.21 percent in 2001 to 10.69 percent in 1995 with a mean (t-statistic) of 7.34 percent (10.65).[13]

4.3.3. Estimates of the expected abnormal rate of return

Differences between the estimates of expected rate of return based on regressions (4) and (5) are included in the last column of table 3. The difference between the estimate of the expected rate of return based on analysts' forecasts and the estimates based on current accounting data represent the analysts' expectation of the abnormal rate of return. On average this is 2.64 percent (t-statistic of 9.02) but there are some years when it is quite large (for example, for the sample of stocks in 1994, the estimate of the abnormal return is 3.99 percent). These results are not surprising in view of the fact that analysts' are in the business of making stock recommendations and their recommendations tend to be "buy" rather than "sell".

An implication of the observation that analysts tend to forecast positive abnormal returns is that caution should be taken when interpreting the meaning of the rate of return that is implied by analysts' earnings forecasts: it is not, as the literature generally claims, an estimate of the cost of capital.

4.4. Variation in the implied expected rate of return with changes in the percentage of analysts making "buy" recommendations

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[12] When we remove the top and bottom three percent of observations (rather than the top and bottom one percent) the explanatory power of these regressions increases such that the range is from a low of 2.97 percent in 1999 to a high of 21.62 percent in 1995.

[13] When we remove the top and bottom three percent of observations (rather than the top and bottom one percent) the estimates of the implied expected rates of return range from range from 3.96 percent in 2001 to 10.71 percent in 1999 with a mean (t-statistic) of 8.17 percent (12.16).

4.4.1. Sample description

I/B/E/S provides data on the percentage of analysts whose forecasts comprise the consensus who also make either a "strong buy" or a "buy" recommendation. We repeat the analyses in section 4.3 for sub-samples with various percentages of these types of forecasts. Descriptive statistics are provided in table 4, panel A. The choice of the six partitions of the data was based on a desire to maintain a sufficient number of observations to provide reasonable confidence in the regression output in each year.

Both the return-on-equity and the price-to-book ratio tend to be higher for the observations where there are more "buy" recommendations comprising the consensus. For example, the median forecasted return-on-equity for the sub-samples where greater than 90 percent of the analysts recommend buy and where between 70 and 90 percent recommend buy is 0.115 and 0.140 while median forecasted return-on-equity for the sub-samples where less than 10 percent of the analysts recommend buy is 0.078: the price-to-book ratio for the sub-samples where greater that 90 percent of the analysts recommend buy and where between 70 and 90 percent recommend buy is 2.234 and 2.745 while median price-to-book ratio for the sub-samples where less than 10 percent of the analysts recommend buy is 1.393.

4.4.2. Estimates of the implied expected rate of return

The results from the estimation of regression (4) based on price, I/B/E/S forecasts of earnings, and current book value and from the estimation of regression (5) based on price and accounting data and are summarized in table 4, panel B. We focus our discussion on the estimates of the implied expected rates of return obtained from these regression parameters. These estimates are included as table 4, panel C.

The estimates of the expected rates of return implied by I/B/E/S analysts' forecasts decline nearly monotonically with the percentage of buy recommendations associated with the forecasts of earnings comprising the consensus (the means of these estimates are 11.87 percent, 12.42 percent, 10.61 percent, 9.24 percent, 7.38 percent, and 6.89 percent) suggesting that analysts' recommendations are, indeed, consistent with their expectations of rates of return. The estimates of the expected rates of return based on prices and current accounting data show a pattern that is very similar to that of those based on analysts' forecasts: the mean estimates of the expected rate of return for each of the groups of data also decline nearly monotonically (the means of these estimates are 8.77 percent, 11.85 percent, 8.75 percent, 6.95 percent, 4.44 percent, and 1.40 percent).

Differences between the estimates of expected rate of return based on percentage of buy recommendations are included in table 4, panel D. Comparing the expected rates of return based on prices and current accounting data with the estimates based on analysts' forecasts reveals that even the analysts who tend not to recommend buy tend to be estimating a positive abnormal return (these mean differences between the estimates based on analysts' forecasts and estimates based on current accounting data are 3.10 percent, 0.56 percent, 1.85 percent, 2.29 percent, 2.94 percent, and 5.94 percent). All of these differences are significant except for the difference in the 70 to 90 percent "buy" recommendation sub-sample.

4.5. Variation in the implied expected rate of return across individual analyst's recommendations

4.5.1. Sample description

In this section, we repeat the analyses in sections 4.3 and 4.4 for sub-samples of the stocks formed on the basis of the type of recommendation by an individual analyst. The I/B/E/S codes, 1 though 5 represent the type of analysts recommendation: 1 ≡ "strong buy", 2 ≡ "buy", 3

≡ "hold", 4 ≡ "underperform", and 5 ≡ "sell". The relative frequency of each of these recommendation types is evident from table 5, panel A.[14] Analysts rarely issue "underperform" or "sell" recommendations – in our sample, the average number of "underperform" and "sell" recommendations per year is 46.82 and 26.27 while the average number of "strong buy", "buy", and "hold" recommendations is 416.45, 466.36, and 462.64. In light of the relatively low number of observations in the "underperform" and "sell" categories, we only analyze the "strong buy", "buy", and "hold" categories.

We provide some descriptive statistics for each of the recommendation sub-samples in table 5, panel B.[15] Focusing on the medians rather than the means, there appears to be little difference in the accuracy of the forecasts (that is, the median absolute forecast error) or in the bias of the forecasts (that is, the median forecast error). Interestingly, the estimates of the return-on-equity decline as the recommendation varies from "strong buy" to "hold" (for example, the median forecasted earnings-to-book value ratio is 0.164 for the "strong buy" sub-sample, 0.157 for the "buy" sub-sample, and 0.142 for the "hold" sub-sample). As with the partitions based on the percentage of buy recommendations described in section 4.4.1, the price-to-book ratio also declines as the recommendation varies from "strong buy" to "hold" (the median price-to-book ratio is 2.542 for the "strong buy" sub-sample, 2.407 for the "buy" sub-sample, and 2.062 for the "hold" sub-sample).

4.5.2. Estimates of the implied expected rate of return

The results from the estimation of regression (4) based on price, I/B/E/S forecasts of earnings, and current book value and from the estimation of regression (5) based on price and

[14] The relative frequencies of recommendation types in our sample are consistent with those observed by Bradshaw (2004) in the First Call database during 1994-1998.
[15] We are currently conducting tests of the significance of differences in the variables among the three recommendation types.

accounting data are summarized in table 5, panel C. We focus our discussion of the estimates of the implied expected rates of return obtained from these regression parameters. These estimates are included as table 5, panel D.

The estimates of the expected rates of return implied by I/B/E/S analysts' forecasts of earnings are very similar when the forecasts are accompanied by a "strong buy" or a "buy" recommendation (the overall mean estimate when the recommendation is "strong buy" is 12.00 percent and the overall mean estimate when the recommendation is "buy" is 11.69 percent). However, when the earnings forecasts are accompanied by a "hold" recommendation, the implied estimate of the expected rate of return is much lower (the overall mean estimate is 9.65 percent and is lower than the estimate for the "strong buy" and "buy" sub-samples in every year).

The estimates of the expected rates of return based on prices and current accounting data (also included in table 5, panel D) show a pattern that is very similar to that of those based on analysts' forecasts: the mean estimates of the expected rate of return are11.49 percent for the "strong buy" sub-sample, 10.90 percent for the "buy" sub-sample, and 8.82 percent for the "hold" sub-sample.

The mean differences in the estimates of the expected rates of return based on forecasts of earnings and those based on actual earnings and the related Fama and MacBeth (1973) t-statistics are included in table 5, panel E. Differences across the recommendation types are also included in this panel. For both methods of estimating the expected rate of return, the expected rate of return for the "strong buy" and "buy" sub-samples are significantly higher than the expected rate of return for the "hold" sub-sample. All estimates of the difference between the expected rate of return implied by prices and current accounting data are significantly less than

the corresponding estimate of the expected rate of return based on analysts' forecasts – in other words, analysts are consistently forecasting statistically significant abnormal returns.

Interestingly, analysts who recommend "strong buy" appear to be doing so based on a relatively small estimated abnormal return (0.59 percent) whereas analysts who recommend "buy" or "hold" are making this recommendation based on a much higher abnormal return (2.67 percent and 2.07 percent).

Of course, we would expect recommendations to implicitly take account of risk differences across the stocks. We now examine this point directly using samples of observations where there are different recommendation types for the same set of firm-year observations.

4.6. Comparison of matched-samples – implicitly a control for risk

In table 6, we report the results where we repeat the analyses for sub-samples where we have either (1) firm-year observations with different analysts making a "strong buy" recommendation and a "buy" recommendation, (2) firm-year observations with both a "buy" and a "hold" recommendation, or (3) firm-year observations with both a "strong buy" and a "hold" recommendation. Here we are able to use the firm as its own match and only alter the recommendation and the related forecast of earnings. Since the same firm-years are used in all estimates of the implied expected rates of return, any observed differences can not represent differences in risk or any other factor that may affect the estimates of the expected rate of return. This potentially limits the generalization of the results but provides a perfect control within the sample.

Table 6, panel A provides some descriptive statistics for the sub-samples while panel B is a summary of the regression outputs. We will focus our discussion on the estimates of the implied expected rate of return provided in table 6, panel C. The mean estimates of the expected

rate of return implied by forecasts accompanied by a "strong buy" recommendation are higher than the mean estimates implied by forecasts that are accompanied by a "buy" recommendation in every year: the overall mean of the estimates when the forecasts are accompanied by a "strong buy" recommendation is 12.24 percent and the overall mean when the forecasts are accompanied by a "buy" recommendation is 11.79 percent. The results for the comparisons of the estimates of the expected rate of return when the forecasts are accompanied by a "buy" recommendation and the estimates when the forecasts are accompanied by a "hold" recommendation are similar as are the results from the comparison of the estimates when the forecasts are accompanied by "strong buy" recommendations and the estimates that are accompanied by "hold" recommendations.

Again, the comparison of the estimates of the expected rates of return based on analysts' forecasts and the estimates based on current accounting data provides an estimate of the analysts' expectation of abnormal return. The results in panel D of table 6 report the differences in expected rate of return between recommendations. Analysts recommending a "strong buy" rather than "buy" expect an additional 0.45 percent abnormal return (t-statistic of 3.82). Similarly, a "buy" recommendation implies a 0.55 percent abnormal return over a "hold" recommendation (t-statistic of 5.56). The combination of these two differences (1.00 percent) nearly equals the 0.87 percent difference in expected return between analysts recommending "strong buy" versus those "hold" (t-statistic of 5.13). Since these comparisons are within the same firm-year observations, the observed differences are attributable solely to the differing views of analysts and are reflected in their recommendations.

Interestingly, for these sub-samples of stocks (where analysts' recommendations definitely differ) there is no evidence that the analysts are forecasting positive abnormal returns:

the estimate of the expected rate of return based on current accounting data (13.11 percent) for the sub-sample of stocks where there are both "strong buy" and "buy" recommendations is greater than the estimates based on these forecasts (12.24 percent and 11.79 percent). A similar observation may be made for the sub-sample where there are both "strong buy" and "hold" recommendations as the estimate of the expected rate of return based on current accounting data lies between the estimates based on these forecasts. The implied abnormal return for the sub-sample where there are both "buy" and "hold" recommendations is positive but insignificant.

5. Summary and conclusions

We show that, on average, the estimate of the analysts' expectation of the abnormal rate of return is 2.64 percent and there are some years when it is quite large (for example, for the sample of stocks in 1994, the estimate of the abnormal return is almost four percent). An implication of the observation that analysts tend to forecast positive abnormal returns is that caution should be taken when interpreting the meaning of the rate of return that is implied by analysts' earnings forecasts: it is not, as the literature generally claims, an estimate of the cost of capital.

Results from sub-samples formed on the basis of recommendation type show that as the analysts' recommendations change from "strong buy" to "sell", the estimate of the expected rate of return declines. Nevertheless, a comparison of the estimates of the expected rate of return based on the analysts' forecasts with the estimates based on current accounting data suggests a positive abnormal return – that is, analysts tend to be more optimistic than the market even when they are not making "buy" recommendations.

Table 1: Descriptive statistics on forecast errors for consensus sample

		Accuracy of forecasts				Bias of forecasts			
		$\lvert FE_{jt+1} \rvert$		$\lvert FE_{jt+1} \rvert / p_{jt}$		FE_{jt+1}		FE_{jt+1} / p_{jt}	
Year	N	Mean	Median	Mean	Median	Mean	Median	Mean	Median
1993	2,034	0.572	0.270	0.035	0.014	-0.355	-0.150	-0.025	-0.007
1994	2,349	0.570	0.300	0.044	0.018	-0.343	-0.180	-0.029	-0.010
1995	2,472	0.608	0.310	0.039	0.016	-0.430	-0.190	-0.029	-0.009
1996	2,747	0.568	0.300	0.036	0.015	-0.394	-0.190	-0.026	-0.010
1997	2,991	0.759	0.420	0.045	0.020	-0.561	-0.350	-0.036	-0.017
1998	2,970	1.076	0.330	0.053	0.020	-0.885	-0.210	-0.035	-0.011
1999	2,678	0.944	0.350	0.057	0.018	-0.678	-0.200	-0.040	-0.009
2000	2,458	1.292	0.450	0.094	0.027	-1.120	-0.340	-0.061	-0.019
2001	2,440	0.770	0.280	0.044	0.016	-0.004	-0.130	-0.016	-0.007
2002	2,394	0.615	0.220	0.044	0.016	-0.025	-0.100	-0.018	-0.006
2003	2,574	0.668	0.220	0.024	0.011	-0.267	-0.050	-0.005	-0.002
Means	2,555.18	0.767	0.314	0.047	0.017	-0.460	-0.190	-0.029	-0.010

Notes to Table 1:

FE_{jt+1} is actual earnings per share for year t+1 as reported by I/B/E/S less the median consensus forecast of earnings per share for year t+1 released in December of year t

p_{jt} is price per share as of the end of fiscal year t

Table 2: Descriptive Statistics on forecast errors for consensus sample

		$\frac{eps_{jt+1}^{Cons}}{bps_{jt}}$ *Equation (4) dependent variable*		$\frac{eps_{jt}}{bps_{jt-1}}$ *Equation (5) dependent variable*		$\frac{p_{jt}}{bps_{jt}}$ *Equation (4) independent variable*		$\frac{p_{jt}-bps_{jt}}{bps_{jt-1}}$ *Equation (5) independent variable*	
Year	N	Mean	Median	Mean	Median	Mean	Median	Mean	Median
1993	2,034	0.150	0.149	0.127	0.132	2.534	2.025	1.906	1.133
1994	2,349	0.154	0.155	0.127	0.135	2.229	1.760	1.518	0.846
1995	2,472	0.164	0.155	0.148	0.149	2.598	2.007	2.143	1.177
1996	2,747	0.154	0.149	0.129	0.142	2.767	2.109	2.386	1.271
1997	2,991	0.152	0.155	0.129	0.144	3.028	2.428	2.541	1.640
1998	2,970	0.144	0.150	0.118	0.135	2.854	2.043	2.311	1.133
1999	2,678	0.148	0.150	0.110	0.133	3.350	1.962	3.361	1.059
2000	2,458	0.125	0.142	0.096	0.131	2.672	1.840	2.559	0.940
2001	2,440	0.077	0.113	0.063	0.100	2.730	2.065	1.997	1.069
2002	2,394	0.099	0.121	0.083	0.106	2.097	1.689	1.243	0.718
2003	2,574	0.122	0.127	0.106	0.119	2.885	2.264	2.386	1.411
Means	2,555.18	0.135	0.142	0.112	0.130	2.704	2.017	2.214	1.127

Notes to Table 2:

$\frac{eps_{jt+1}^{Cons}}{bps_{jt}}$ is the median consensus forecast of earnings per share as reported by I/B/E/S for year t+1 released in December of year *t* divided by book value per share at time *t*

$\frac{eps_{jt}}{bps_{jt-1}}$ is the earnings per share for year *t* from COMPUSTAT divided by book value per share at time *t*-1

$\frac{p_{jt}}{bps_{jt}}$ is the price per share at time *t* divided by the book value per share at time *t*

$\frac{p_{jt}-bps_{jt}}{bps_{jt-1}}$ is the price per share at time *t* less book value per share at time *t* deflated by book value per share at time *t*-1

Table 3: Comparison of implied expected rates of return based on I/B/E/S forecasts of earnings with implied expected rate of return based on current accounting data

$$\frac{eps_{jt+1}^{Cons}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \zeta_{jt} \quad (5)$$

		Analysts' consensus earnings forecasts				**Current accounting data**				**Difference in expected rate of return**
Year	N	γ_0	γ_1	Adj R^2	$\hat{r} = \gamma_0 + \gamma_1$	δ_0	δ_1	Adj R^2	$\hat{r} = \delta_0$	
1993	2,034	0.081	0.028	14.46%	10.82%	0.078	0.025	13.37%	7.82%	3.00%
		(18.07)	(18.56)			(18.15)	(17.74)			
1994	2,349	0.078	0.034	12.62%	11.19%	0.072	0.036	16.46%	7.20%	3.99%
		(15.71)	(18.44)			(17.29)	(21.53)			
1995	2,472	0.100	0.025	14.69%	12.47%	0.107	0.019	9.81%	10.69%	1.78%
		(26.18)	(20.65)			(24.92)	(16.43)			
1996	2,747	0.091	0.023	13.02%	11.37%	0.090	0.016	6.89%	9.01%	2.36%
		(23.79)	(20.30)			(19.82)	(14.29)			
1997	2,991	0.089	0.021	8.07%	10.99%	0.076	0.021	8.67%	7.64%	3.35%
		(19.02)	(16.23)			(16.14)	(16.88)			
1998	2,970	0.089	0.019	8.25%	10.85%	0.072	0.020	11.79%	7.19%	3.66%
		(20.04)	(16.37)			(17.15)	(19.95)			
1999	2,678	0.128	0.006	1.98%	13.43%	0.099	0.003	0.86%	9.93%	3.50%
		(31.61)	(7.42)			(19.34)	(4.91)			
2000	2,458	0.086	0.015	4.37%	10.08%	0.077	0.007	1.48%	7.69%	2.39%
		(16.46)	(10.64)			(11.96)	(6.16)			
2001	2,440	0.038	0.015	2.72%	5.23%	0.032	0.016	4.53%	3.21%	2.02%
		(6.19)	(8.33)			(6.47)	(10.80)			
2002	2,394	0.023	0.036	9.56%	5.92%	0.037	0.037	13.51%	3.66%	2.26%
		(3.90)	(15.94)			(8.88)	(19.36)			
2003	2,574	0.048	0.026	13.06%	7.37%	0.067	0.016	6.28%	6.67%	0.70%
		(10.59)	(19.69)			(13.68)	(13.16)			
Means	2,555.18	0.077	0.022	9.35%	9.97%	0.073	0.020	8.51%	7.34%	2.64%
t-Statistics		(8.52)	(8.38)		(12.52)	(10.65)	(6.35)		(10.65)	(9.02)

Notes to Table 3:

The table reports the results of estimating regression (4) using I/B/E/S consensus forecasts and regression (5) using current accounting data cross-sectionally using all available observations. Observations with any of the dependent or independent variables in the top and bottom 1 percent observations are removed to reduce the effects of outliers. The variables are as defined in the notes to Tables 1 and 2. Summary means across the annual regressions and the related Fama and MacBeth (1973) t-statistics are provided. The last column contains the difference between estimates of expected return from the estimation of regression (4) using I/B/E/S consensus forecasts and regression (5) using current accounting data.

Table 4: Variation in the implied expected rate of return with changes in the percentage of analysts' making "buy" recommendation

Panel A: Descriptive statistics by percent of buy recommendations

	90 ≤ % Buy ≤ 100		70 ≤ % Buy ≤ 90		50 ≤ % Buy < 70		30 ≤ % Buy < 50		10 ≤ % Buy < 30		0 ≤ % Buy < 10	
	Mean	Mean	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
$\lvert FE_{jt+1}\rvert$	0.690	0.294	0.983	0.336	0.593	0.300	0.766	0.324	0.683	0.321	1.095	0.292
$\lvert FE_{jt+1}\rvert / p_{jt}$	0.044	0.017	0.025	0.013	0.038	0.015	0.043	0.016	0.055	0.019	0.088	0.028
FE_{jt+1}	-0.163	-0.203	-0.782	-0.212	-0.373	-0.186	-0.487	-0.194	-0.383	-0.148	-0.765	-0.136
FE_{jt+1}/p_{jt}	-0.031	-0.011	-0.016	-0.007	-0.025	-0.008	-0.027	-0.009	-0.034	-0.009	-0.045	-0.013
$eps_{jt+1}^{Cons} / bps_{jt}$	0.134	0.154	0.176	0.172	0.149	0.148	0.137	0.134	0.124	0.120	0.076	0.102
eps_{jt} / bps_{jt-1}	0.111	0.143	0.179	0.173	0.131	0.138	0.116	0.122	0.095	0.105	0.030	0.072
p_{jt} / bps_{jt}	3.104	2.234	3.558	2.745	2.661	2.088	2.324	1.860	2.229	1.748	1.693	1.393
$(p_{jt} - bps_{jt}) / bps_{jt-1}$	3.057	1.519	3.615	2.112	2.005	1.187	1.446	0.912	1.362	0.753	0.721	0.386
# of observations	608.64		319.91		513.00		247.18		166.91		252.27	

Table 4: Continued

Panel B: Summary of results of estimation by percent of buy recommendations

$$\frac{eps_{jt+1}^{Cons}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \zeta_{jt} \quad (5)$$

		Analysts' consensus earnings forecasts			Current accounting data		
Recommendation	N	γ_0	γ_1	Adj R^2	δ_0	δ_1	Adj R^2
90 ≤ % Buy ≤ 100	608.64	0.110	0.009	1.94%	0.088	0.010	4.64%
		(12.92)	(2.93)		(10.38)	(2.29)	
70 ≤ % Buy ≤ 90	319.91	0.102	0.022	16.94%	0.119	0.019	16.23%
		(9.54)	(7.66)		(10.56)	(6.04)	
50 ≤ % Buy < 70	513.00	0.079	0.027	17.55%	0.088	0.022	11.97%
		(9.16)	(17.46)		(11.64)	(10.19)	
30 ≤ % Buy < 50	247.18	0.058	0.034	27.92%	0.070	0.033	18.61%
		(4.40)	(7.48)		(7.19)	(9.95)	
10 ≤ % Buy < 30	166.91	0.034	0.040	36.41%	0.044	0.039	28.23%
		(3.55)	(9.81)		(6.74)	(7.11)	
0 ≤ % Buy < 10	252.27	0.056	0.013	3.28%	0.014	0.024	3.55%
		(3.63)	(1.49)		(1.68)	(3.48)	

Table 4: Continued

Panel C: Estimates of expected rate of return

	Analysts' consensus earnings forecasts						Current accounting data					
Year	90 ≤ % ≤ 100	70 ≤ % ≤ 90	50 ≤ % < 70	30 ≤ % < 50	10 ≤ % < 30	0 ≤ % < 10	90 ≤ % ≤ 100	70 ≤ % ≤ 90	50 ≤ % < 70	30 ≤ % < 50	10 ≤ % < 30	0 ≤ % < 10
1993	11.04%	11.87%	12.36%	9.79%	7.09%	8.78%	9.78%	9.48%	9.20%	8.17%	5.34%	1.69%
1994	11.96%	13.22%	13.13%	9.46%	10.74%	8.36%	8.74%	11.81%	9.70%	7.74%	7.08%	1.67%
1995	15.62%	15.24%	12.39%	11.93%	9.72%	12.74%	12.67%	16.88%	10.86%	11.08%	6.83%	6.80%
1996	13.55%	12.95%	11.89%	10.35%	7.91%	9.05%	10.82%	11.37%	12.10%	7.79%	4.67%	3.52%
1997	12.22%	13.70%	12.97%	13.05%	7.17%	6.59%	7.94%	11.69%	10.99%	8.66%	4.37%	0.26%
1998	12.48%	14.34%	10.90%	11.55%	10.21%	7.98%	8.97%	13.85%	8.53%	9.09%	4.64%	-1.07%
1999	15.22%	15.67%	12.46%	12.88%	8.43%	8.03%	10.32%	16.20%	9.34%	9.86%	4.81%	3.49%
2000	11.98%	14.50%	9.65%	7.97%	6.76%	5.32%	8.79%	16.53%	9.08%	4.85%	-0.54%	-0.98%
2001	6.96%	6.54%	5.43%	2.50%	4.48%	1.17%	4.85%	6.35%	3.50%	-0.25%	5.48%	-2.42%
2002	8.86%	7.73%	7.07%	5.59%	2.82%	1.72%	2.81%	9.59%	5.45%	3.95%	1.58%	-1.11%
2003	10.70%	10.82%	8.41%	6.61%	5.87%	6.10%	10.82%	6.64%	7.54%	5.57%	4.60%	3.58%
Means	11.87%	12.42%	10.61%	9.24%	7.38%	6.89%	8.77%	11.85%	8.75%	6.95%	4.44%	1.40%
t-Statistics	(15.57)	(13.84)	(13.45)	(9.28)	(10.15)	(6.90)	(10.38)	(10.56)	(11.64)	(7.19)	(6.74)	(1.68)

Table 4: Continued

Panel D: Differences in (t-statistics for) estimates of expected rate of return

		Analysts' consensus earnings forecasts						**Current accounting data**				
		90 ≤ % ≤ 100	70 ≤ % ≤ 90	50 ≤ % < 70	30 ≤ % < 50	10 ≤ % < 30	0 ≤ % < 10	90 ≤ % ≤ 100	70 ≤ % ≤ 90	50 ≤ % < 70	30 ≤ % < 50	10 ≤ % < 30
Analysts' consensus earnings forecasts	70 ≤ % ≤ 90	-0.55% (-1.57)										
	50 ≤ % < 70	1.26% (2.62)	1.81% (3.65)									
	30 ≤ % < 50	2.63% (5.39)	3.17% (6.98)	1.36% (3.21)								
	10 ≤ % < 30	4.49% (8.34)	5.03% (9.49)	3.23% (6.60)	1.86% (2.73)							
	0 ≤ % < 10	4.98% (9.91)	5.52% (9.14)	3.71% (6.89)	2.35% (3.64)	0.49% (0.85)						
Current accounting data	90 ≤ % ≤ 100	3.10% (6.09)										
	70 ≤ % ≤ 90		0.56% (0.94)					-3.08% (-2.93)				
	50 ≤ % < 70			1.85% (5.36)				0.02% (0.04)	3.10% (3.37)			
	30 ≤ % < 50				2.29% (7.31)			1.82% (2.69)	4.90% (5.55)	1.80% (3.33)		
	10 ≤ % < 30					2.94% (4.38)		4.33% (5.16)	7.41% (5.37)	4.31% (4.81)	2.51% (2.65)	
	0 ≤ % < 10						5.49% (9.26)	7.37% (14.59)	10.45% (9.03)	7.35% (10.58)	5.55% (7.59)	3.04% (3.97)

Table 4: Continued

Notes to Table 4:

Using the median consensus analysts' forecast and the percent of buy recommendations from the summary I/B/E/S database, we estimate expected rate of return by percentage of buy recommendations. Panel A reports descriptive statistics by percentage of buy recommendations. The variables are as defined in the notes to Tables 1 and 2. Panel B reports the results of estimating regression (4) using I/B/E/S consensus forecasts and regression (5) using current accounting data cross-sectionally using all available observations of that percentage of buy recommendations. Within the percentage of buy recommendations, observations with any of the dependent or independent variables in the top and bottom 1percent observations are removed to reduce the effects of outliers. The reported numbers are the summary means across the annual regressions and the related Fama and Macbeth (1973) t-statistics. Panel C reports the annual estimates of expected rate of return for each of the methods in Panel B by percentage of buy recommendations. Panel D reports summary means of the differences in estimates across the annual regressions and the related Fama and Macbeth (1973) t-statistics.

Table 5: Variation in the implied expected rate of return across analyst recommendations

Panel A: Frequency of each of recommendation type

	Recommendation				
Year	1 ≡ Strong Buy	2 ≡Buy	3 ≡Hold	4 ≡Underperform	5 ≡Sell
1993	239	226	270	22	32
1994	373	416	419	35	38
1995	340	415	429	27	26
1996	435	464	388	29	20
1997	557	545	453	20	16
1998	501	568	522	28	11
1999	393	435	352	16	7
2000	420	532	418	13	11
2001	508	592	482	26	27
2002	350	424	579	140	39
2003	465	513	777	159	62
Means	416.45	466.36	462.64	46.82	26.27
Medians	420	464	429	27	26

Panel B: Descriptive statistics by recommendation type

	1 ≡Strong Buy		2 ≡Buy		3 ≡Hold	
	Mean	Median	Mean	Median	Mean	Median
$\|FE_{jt+1}\|$	0.673	0.358	0.861	0.343	0.668	0.334
$\|FE_{jt+1}\|/ p_{jt}$	0.030	0.014	0.030	0.013	0.035	0.014
FE_{jt+1}	-0.419	-0.227	-0.604	-0.211	-0.356	-0.168
FE_{jt+1}/p_{jt}	-0.019	-0.008	-0.018	-0.008	-0.019	-0.007
$eps^{Det}_{jt+1}/bps_{jt}$	0.170	0.164	0.165	0.157	0.148	0.142
eps_{jt}/bps_{jt-1}	0.170	0.163	0.162	0.155	0.144	0.140
p_{jt}/bps_{jt}	3.440	2.542	3.283	2.407	2.714	2.062
$(p_{jt} - bps_{jt})/bps_{jt-1}$	3.422	1.850	3.124	1.644	2.074	1.152
# of observations	416.45		466.36		462.64	

Table 5: Continued

Panel C: Summary of results of estimation by recommendation type

$$\frac{eps_{jt+1}^{Cons}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \zeta_{jt} \quad (5)$$

		Analysts' consensus earnings forecasts			Current accounting data		
Recommendation	N	γ_0	γ_1	Adj R^2	δ_0	δ_1	Adj R^2
1 ≡Strong Buy	416.46	0.098	0.022	15.24%	0.115	0.018	13.48%
		(12.38)	(8.71)		(14.96)	(6.96)	
2 ≡Buy	466.36	0.094	0.023	19.31%	0.109	0.020	16.17%
		(13.38)	(9.33)		(16.39)	(7.71)	
3 ≡Hold	462.64	0.065	0.031	29.38%	0.088	0.028	24.77%
		(9.77)	(16.02)		(16.74)	(13.91)	

Panel D: Estimates of expected rate of return

	Analysts' detail earnings forecasts			Current accounting data		
Year	1 ≡Strong Buy	2 ≡Buy	3 ≡Hold	1 ≡Strong Buy	2 ≡Buy	3 ≡Hold
1993	11.78%	12.03%	10.35%	10.33%	9.80%	8.45%
1994	13.29%	13.16%	12.23%	10.14%	10.54%	9.71%
1995	13.49%	13.47%	11.91%	14.67%	14.10%	11.96%
1996	12.88%	11.83%	9.16%	11.19%	10.77%	8.48%
1997	12.11%	11.24%	10.28%	11.30%	9.79%	8.66%
1998	11.49%	12.22%	9.28%	10.74%	11.71%	7.80%
1999	15.87%	14.44%	11.39%	15.44%	12.86%	10.19%
2000	13.08%	13.27%	10.02%	15.20%	14.58%	10.86%
2001	9.56%	8.51%	6.66%	9.81%	7.75%	6.20%
2002	8.47%	9.24%	7.50%	7.33%	8.46%	6.51%
2003	9.95%	9.21%	7.43%	10.28%	9.54%	8.25%
Means	12.00%	11.69%	9.65%	11.49%	10.90%	8.82%
t-Statistics	(19.03)	(19.80)	(17.18)	(14.96)	(16.39)	(16.74)

Table 5: Continued

Panel E: Differences in (t-statistics for) estimates of expected rate of return

		Analysts' detail earnings forecasts			Current accounting data	
		1 ≡Strong Buy	2 ≡Buy	3 ≡Hold	1 ≡Strong Buy	2 ≡Buy
Analysts' detail earnings forecasts	2 ≡Buy	0.30% (1.32)				
	3 ≡Hold	2.34% (6.93)	2.04% (8.28)			
Current accounting data	1 ≡Strong Buy	0.50% (1.15)				
	2 ≡Buy		0.79% (2.20)		0.59% (1.71)	
	3 ≡Hold			0.83% (2.55)	2.67% (6.27)	2.07% (6.76)

Notes to Table 5:

Using the most recent individual analysts' forecast from the detail I/B/E/S database and the analysts' most recent recommendation, we estimate expected rate of return by recommendation type. Panel A provides counts by recommendation type of the available observations. Due to the lack of observations, the categories of "underperform" and "sell" are not tested. Panel B reports descriptive statistics by recommendation type. The variables are as defined in the notes to Tables 1 and 2. Panel C reports the results of estimating regression (4) using I/B/E/S detail forecasts and regression (5) using current accounting data cross-sectionally using all available observations of that recommendation type. Within the recommendation type, observations with any of the dependent or independent variables in the top and bottom 1 percent observations are removed to reduce the effects of outliers. The reported numbers are the summary means across the annual regressions and the related Fama and Macbeth (1973) t-statistics. Panel D reports the annual estimates of expected rate of return for each of the methods in Panel C by recommendation type. Panel E reports summary means of the differences in estimates across the annual regressions and the related Fama and Macbeth (1973) t-statistics.

Table 6: Comparison of matched-samples with differing recommendations

Panel A: Descriptive Statistics

1 ≡ Strong Buy vs. 2 ≡Buy	Mean	Median
1 – Strong Buy		
$\lvert FE_{jt+1}\rvert$	0.791	0.420
$\lvert FE_{jt+1}\rvert / p_{jt}$	0.027	0.014
FE_{jt+1}	-0.492	-0.269
FE_{jt+1}/p_{jt}	-0.017	-0.009
$eps^{Det}_{jt+1}/bps_{jt}$	0.186	0.172
2 – Buy		
$\lvert FE_{jt+1}\rvert$	0.752	0.380
$\lvert FE_{jt+1}\rvert / p_{jt}$	0.025	0.012
FE_{jt+1}	-0.439	-0.226
FE_{jt+1}/p_{jt}	-0.015	-0.007
$eps^{Det}_{jt+1}/bps_{jt}$	0.182	0.167
eps_{jt}/bps_{jt-1}	0.196	0.176
p_{jt}/bps_{jt}	3.608	2.655
$(p_{jt} - bps_{jt})/bps_{jt-1}$	3.699	1.992
# of observations	173.00	

2 ≡Buy vs. 3 ≡Hold	Mean	Median
2 – Buy		
$\lvert FE_{jt+1}\rvert$	0.760	0.372
$\lvert FE_{jt+1}\rvert / p_{jt}$	0.029	0.014
FE_{jt+1}	-0.426	-0.219
FE_{jt+1}/p_{jt}	-0.017	-0.008
$eps^{Det}_{jt+1}/bps_{jt}$	0.166	0.154
3 – Hold		
$\lvert FE_{jt+1}\rvert$	0.740	0.375
$\lvert FE_{jt+1}\rvert / p_{jt}$	0.028	0.013
FE_{jt+1}	-0.367	-0.190
FE_{jt+1}/p_{jt}	-0.015	-0.007
$eps^{Det}_{jt+1}/bps_{jt}$	0.161	0.152
eps_{jt}/bps_{jt-1}	0.170	0.153
p_{jt}/bps_{jt}	3.020	2.273
$(p_{jt} - bps_{jt})/bps_{jt-1}$	2.541	1.464
# of observations	182.18	

1 ≡Strong Buy vs. 3 ≡Hold	Mean	Median
1 – Strong Buy		
$\lvert FE_{jt+1}\rvert$	0.826	0.426
$\lvert FE_{jt+1}\rvert / p_{jt}$	0.031	0.015
FE_{jt+1}	-0.486	-0.259
FE_{jt+1}/p_{jt}	-0.019	-0.008
$eps^{Det}_{jt+1}/bps_{jt}$	0.176	0.164
3 – Hold		
$\lvert FE_{jt+1}\rvert$	0.756	0.389
$\lvert FE_{jt+1}\rvert / p_{jt}$	0.028	0.014
FE_{jt+1}	-0.352	-0.178
FE_{jt+1}/p_{jt}	-0.015	-0.006
$eps^{Det}_{jt+1}/bps_{jt}$	0.167	0.157
eps_{jt}/bps_{jt-1}	0.177	0.159
p_{jt}/bps_{jt}	3.209	2.381
$(p_{jt} - bps_{jt})/bps_{jt-1}$	2.844	1.569
# of observations	150.00	

Table 6: Continued

Panel B: Summary of results of regressions of matched-samples

$$\frac{eps_{jt+1}^{Det}}{bps_{jt}} = \gamma_0 D_{jt}^{Low} + \gamma_1 D_{jt}^{Low} \times \frac{p_{jt}}{bps_{jt}} + \gamma_0' D_{jt}^{High} + \gamma_1' D_{jt}^{High} \times \frac{p_{jt}}{bps_{jt}} + \mu_{jt} \qquad \frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \zeta_{jt}$$

	Analysts' detail earnings forecasts 1 ≡ Strong Buy 2 ≡ Buy					**Current accounting data**		
# of firms	γ_0	γ_1	γ_0'	γ_1'	Adj R^2	δ_0	δ_1	Adj R^2
173.00	0.096	0.027	0.091	0.027	76.96%	0.131	0.021	23.74%
	(12.23)	(9.49)	(11.55)	(9.52)		(13.31)	(7.18)	

	Analysts' detail earnings forecasts 2 ≡Buy 3 ≡Hold					**Current accounting data**		
# of firms	γ_0	γ_1	γ_0'	γ_1'	Adj R^2	δ_0	δ_1	Adj R^2
182.18	0.082	0.029	0.076	0.029	76.67%	0.104	0.027	29.66%
	(11.57)	(10.92)	(10.28)	(10.79)		(14.92)	(13.10)	

	Analysts' detail earnings forecasts 1 ≡Strong Buy 3 ≡Hold					**Current accounting data**		
# of firms	γ_0	γ_1	γ_0'	γ_1'	Adj R^2	δ_0	δ_1	Adj R^2
150.00	0.090	0.028	0.082	0.028	77.49%	0.112	0.025	27.05%
	(10.26)	(12.63)	(10.74)	(13.38)		(15.37)	(9.16)	

Table 6: Continued

Panel C: Estimates of expected returns for matched-samples

1 ≡Strong Buy vs. 2 ≡Buy

	Analysts' detail earnings forecasts		Current accounting
Year	1 ≡Strong Buy	2 ≡Buy	data
1993	12.25%	12.01%	12.49%
1994	13.13%	13.00%	11.51%
1995	14.84%	13.60%	18.52%
1996	12.30%	11.82%	10.91%
1997	12.06%	11.97%	11.60%
1998	10.38%	9.34%	11.08%
1999	15.84%	15.73%	17.44%
2000	14.11%	13.40%	17.90%
2001	9.74%	9.22%	9.75%
2002	10.39%	10.15%	9.92%
2003	9.60%	9.42%	13.06%
Means	12.24%	11.79%	13.11%
t-Statistics	(19.33)	(18.67)	(13.31)

2 ≡Buy vs. 3 ≡Hold

	Analysts' detail earnings forecasts		Current accounting
Year	2 ≡Buy	3 ≡Hold	data
1993	11.85%	11.81%	8.28%
1994	12.54%	12.20%	10.74%
1995	13.15%	12.62%	13.84%
1996	9.98%	9.08%	9.42%
1997	11.93%	10.69%	12.40%
1998	11.05%	10.72%	11.64%
1999	13.94%	13.28%	10.71%
2000	11.76%	11.50%	13.80%
2001	8.93%	8.15%	8.22%
2002	8.40%	7.89%	7.75%
2003	8.49%	7.98%	7.72%
Means	11.09%	10.54%	10.41%
t-Statistics	(19.37)	(17.79)	(14.92)

Table 6: Continued

Panel C: Estimates of expected returns for matched-samples

1 ≡Strong Buy vs. 3 ≡Hold

	Analysts' detail earnings forecasts		Current accounting
Year	1 ≡Strong Buy	3 ≡Hold	**data**
1993	11.71%	11.49%	9.32%
1994	14.32%	13.10%	11.33%
1995	15.92%	13.66%	15.53%
1996	12.36%	11.40%	13.07%
1997	13.26%	12.04%	13.03%
1998	10.64%	9.68%	10.84%
1999	13.46%	12.91%	11.74%
2000	11.38%	11.01%	10.28%
2001	8.59%	7.99%	8.18%
2002	8.68%	8.05%	7.09%
2003	9.37%	8.77%	12.56%
Means	11.79%	10.92%	11.18%
t-Statistics	(16.53)	(17.87)	(15.37)

Table 6: Continued

Panel D: Differences in (t-statistics for) estimates of expected rate of return

	Analysts' detail earnings forecasts	
	1 ≡Strong Buy	2 ≡Buy
Analysts' detail earnings forecasts 2 ≡Buy	0.45% (3.82)	
Current accounting data	-0.87% (-1.44)	-1.32% (-1.99)

	Analysts' detail earnings forecasts	
	2 ≡Buy	3 ≡Hold
Analysts' detail earnings forecasts 3 ≡Hold	0.55% (5.56)	
Current accounting data	0.68% (1.34)	0.13% (0.24)

	Analysts' detail earnings forecasts	
	1 ≡Strong Buy	3 ≡Hold
Analysts' detail earnings forecasts 3 ≡Hold	0.87% (5.13)	
Current accounting data	0.61% (1.21)	-0.26% (-0.47)

Notes to Table 6:

Using the most recent individual analysts' forecast from the detail I/B/E/S database and the analysts' most recent recommendation, we estimate expected rate of return by for matched samples where analysts have differing recommendations about the same firm-year. Panel A reports descriptive statistics on the firms for which we can find information for more than one recommendation type. The variables are as defined in the notes to Tables 1 and 2. The dummy variable $D^{Low(High)}$ is equal to 1 when the observation has the low (high) recommendation type, else 0. Panel B reports the results of estimating regression (4) using I/B/E/S detail forecasts and regression (5) using current accounting data cross-sectionally using all available observations of that recommendation type. Within the recommendation type, observations with any of the dependent or independent variables in the top and bottom 1 percent observations are removed to reduce the effects of outliers. The reported numbers are the summary means across the annual regressions and the related Fama and Macbeth (1973) t-statistics. Panel C reports the annual estimates of expected rate of return for each of the methods in Panel B by recommendation type. Panel D reports summary means of the differences in estimates across the annual regressions and the related Fama and Macbeth (1973) t-statistics.

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