EPS – in your dreams

Are analysts' long-term views always on the rosy side?

US research has found that consensus forecasts made 12 months prior to the announcement of EPS overestimate the reported result by up to 57%. A study of 30 Australian companies reveals a similar, although smaller, bias in Australian consensus EPS forecasts. **GABRIEL RADZYMINSKI** *and* **PAUL DORTKAMP** *report their findings*

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A key aspect of the analyst's function is to make forecasts of future earnings per share. Paying people to make forecasts implies that the forecasts are of economic value. However, research in the US and the UK has called into question the value of EPS forecasts after finding a tendency for analysts to overestimate them. These findings have implications for all those who use this information.

The aim of this paper is to show that EPS forecasts for Australian companies' earnings are subject to a similar bias. Once this bias is identified and quantified, users of EPS forecasts can factor in an adjustment in their valuation models or make investment decisions based on expected earnings surprises. We believe that a world with forecasts is fundamentally better than a world without, although users of forecasts must be always conscious of the fact that forecasts are just that.

This study examines 30 of the top 50 companies listed on the Australian Stock Exchange, using two fiscal years of consensus EPS forecasts for reporting dates in calendar 1996 supplied by I/B/E/S.[1] Using the I/B/E/S fiscal year format avoids the problems associated with different reporting dates for each company, as we are able to use months prior to a company's reporting date for fiscal years FY1 and FY2. For example, forecasts made in June for two companies whose reporting dates are 30 June and 31 July are classified as t = 0 and t = -1 respectively.

We analysed the data sample by calculating a forecast error measure for the mean, high and low-consensus forecasts. The forecast error is obtained by subtracting the actual EPS from the forecast EPS and dividing by the actual EPS.

Similar methods are used by several studies of EPS forecasts in the US and the UK, including Dreman and Berry (1995), Clayman and Schwarz (1994) and Capstaff, Paudyal and Rees (1996). We use the results of these studies as reference points with which to compare our results.

Dreman and Berry (1995) use a sample of 66,100 consensus estimates. They calculate forecast errors using four different measures (or metrics). Their error metrics find an average forecast error of more than 20% of actual EPS.[2]

They also examine the effect of changing economic conditions on the forecast error. This serves to counter the easily-levelled criticism that the overestimation is due primarily to economic conditions prevailing at the

time of sampling. In a study encompassing three periods of economic expansion and four periods of recession, they found "no significant difference between the mean size of analyst errors in periods of expansion and recessions".[3]

Dreman and Berry draw two major conclusions. The first is that the 20% average forecast error is "too high for investors to rely on consensus forecasts as the major determinant of stock valuation".[4] Their second conclusion is that only a small percentage of estimates fall within the acceptable range of ±10%.[5]

Clayman and Schwarz (1994) examine a sample of 399 US companies from 1982 to 1992. They compare the excess of first-month estimates over actual earnings and the excess of last-month estimates over actual earnings (ie, forecasts made twelve months and one month, respectively, from reporting of actual EPS) for their sample. On average, first-month forecasts were 57.1% greater than actual EPS and last-month forecasts were 11.9% greater than actual.

They put forward three factors that may explain this bias towards overestimation:[6]

- analysts fall in love with their stocks;[7]
- agency problems arise when investment houses also engage in investment-banking activity;
- analysts' perceptions that negative commentaries may lead to their lines of communication with a company being cut.[8]

Capstaff *et al* (1996) examine 1,000 UK companies from February 1987 to December 1990. They calculate a forecast error in much the same manner as Clayman and Schwarz (1994) and Dreman and Berry (1995), except that they use the absolute value of this forecast error. They divide their sample into companies with positive EPS movements and those with negative EPS movements.

They found a mean forecast error over all horizons of 16.6% but the accuracy of the forecasts improved as the horizon shortened.[9] The mean forecast error fell from 25% to roughly 10% over the forecast horizon. They also found that companies with positive EPS movements tended to have more accurate forecasts. Capstaff *et al* draw two major conclusions:

- analysts appear reluctant to revise EPS downwards; and
- analysts' forecasts have an optimistic bias and overreact to information.[10]

In Australian research, Frankel and Lee (1995) found that Australian earnings forecasts had the least-positive bias, as well as the second-lowest absolute forecast error, of seven major stockmarkets (the others were the US, UK, Canada, Japan, Germany and France). While it may be satisfying to be able to claim the least bias, we believe it is productive to focus on the bias itself and consider how to factor it into the investment decision-making process.

FINDINGS

We examined consensus EPS forecasts for the 24 months covering FY1 and FY2 for a sample of 30 large-cap stocks with reporting dates in calender 1996.[11] The data, supplied by I/B/E/S, was analysed by calculating a measure of the standardised forecast error for each of the 24 months prior to reporting of EPS. This approach is similar to that taken by Dreman and Berry (1995), Clayman and Schwarz (1994) and Capstaff *et al* (1996).

For each of the 24 months prior to reporting of 1996 EPS, the following consensus error measure was calculated:

$$\frac{ForecastEPS_t - ActualEPS}{ActualEPS}$$

This measure of forecast error was calculated for the 30 companies. The measure was then recalculated with the outliers removed from the sample.[12]

The condition for perfect forecasting would be that $Forecast\ EPS_t = Actual\ EPS$. Under this condition the mean forecast error equals zero since at each month

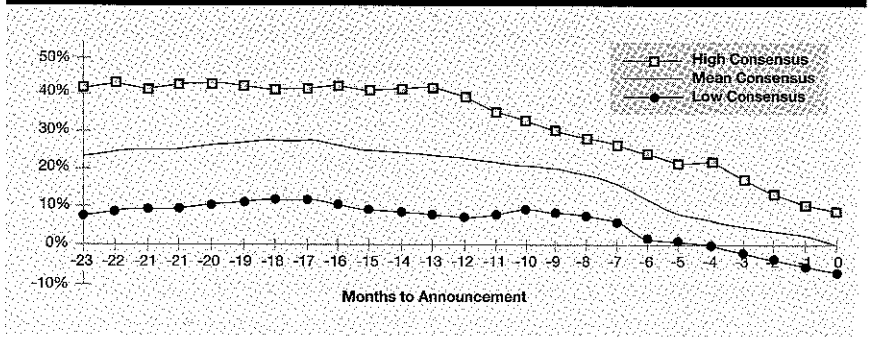
$$\frac{ForecastEPS_t - ActualEPS}{ActualEPS} = 0$$

Therefore we tested the hypothesis that the mean error was different from zero using Student's t-test.[13]

The results are, for the most part, statistically significant and provide strong evidence that the mean is non-zero, that is, that forecasts are not perfect. The average consensus mean forecast error over all time horizons is 17.91%. The individual results range from 0.88% immediately before announcement to almost 25% two years to announcement. Twelve months before announcement, the forecast error for the mean consensus forecasts was 22.47%.

The measures of forecast error also show that, for the sample, there was a persistent overestimation of EPS forecasts that decreased as the time horizon shortened. Figure 1 illustrates the reduction in forecast errors as

Figure 1: Overestimation of EPS



announcement date approaches. Full results are given in Table 1.

In comparison, Clayman and Schwarz (1994) found that 12 months prior to announcement the forecast error was 57.1% for their entire sample, and Dreman and Berry (1995) found an average absolute surprise (or forecast error) of 43.8% for their entire sample.

The results obtained from our small sample are not representative of the entire Australian market.[14]

Rather, they are indicative of a best-case scenario: a wider sample would be likely to yield a greater forecast error.

Figure 1 and Table 1 also contain the high and low-consensus estimates for each period. We clearly see that two years from announcement, the low-consensus forecasts are overestimating actual EPS by roughly 7%. The low-consensus is, over all time horizons, roughly within Dreman and Berry's acceptable range of 10%. The low-consensus also underestimates EPS from three months to immediately prior to announcement by up to a statistically significant 5.9%.

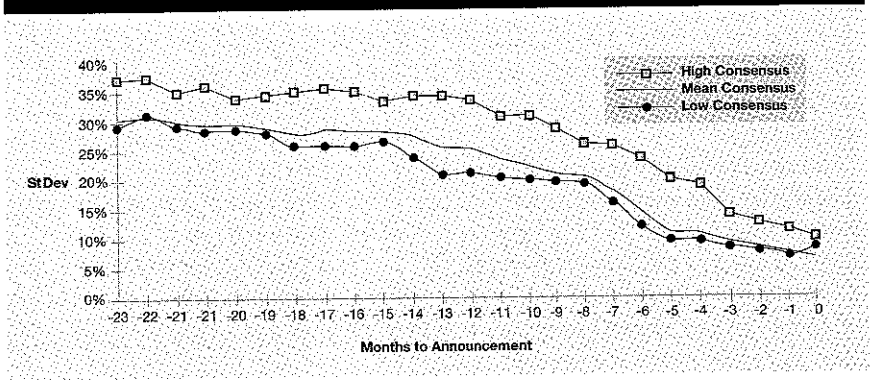
The high-consensus estimates range from an overestimation of almost 42% 24 months before announcement to about 8.5% immediately before announcement.

These results might prompt the user of EPS forecasts to simply use the low-consensus forecasts in their decision-making. This may be an appropriate alternative, but using the low-consensus forecast will still lead to a portfolio of mispriced and mispicked shares.

The implications of these results are wide-ranging. They call into question, *inter alia*: the way in which EPS forecasts are used; the true value of forecasts, especially those made more than 4-5 months before announcement of results; the way in which forecasts are made (are analysts incorporating the right information at the right time or do they merely extrapolate past results?); the motivations of analysts in making the forecasts; the validity of investment decisions based on forecasts made more than six months before announcement.

These results also call into question the information that analysts incorporate in their forecasts.

Figure 2: Standard deviation of Consensus Forecasts



EPS forecasts are made and revised throughout the year as new information comes to light. Assuming forecasts are made rationally, changes in EPS forecasts are signs that analysts are acting on new information. The change in each forecast depends on the analysts' interpretation of the new information.

The reduction in forecast errors as the time horizon shortens demonstrates that analysts are incorporating more and more information as it becomes available.

The reduction in the standard deviation of forecasts over the period, as illustrated in Figure 2, indicates increasingly homogeneous information (reduced information asymmetry) as time to reporting approaches (or at least that analysts are interpreting the information more homogeneously).

The information used to make forecasts can be divided into information time-zones. For the longer horizons, such as forecasts made in FY2 for FY1, the analyst is probably relying on information relating to the previous year (either EPS results or disclosures materially affecting the current year's results).

However, as the end of FY2 approaches and the horizon for FY1 forecasts shortens, analysts begin to incorporate not only information relating to FY2 but also the implications of FY2 for FY1. As soon as FY2 results are announced, their effect begins to flow down into the analysts' forecasts. This probably explains the sudden drop in the standard deviation of consensus forecasts seen around the 8-9 month horizon in Figure 2.

Another factor to be considered is the figures analysts report. Capstaff *et al* suggest that analysts deliberately ignore public information but revise forecasts as a result of private information, because investors prefer to form their own opinions on public information.

Whether or not this is the exact way in which information is incorporated, the investor relying on EPS forecasts still faces the dilemma of overestimation. Assuming that earnings play a major role in determining the price of a share, the price depends more on the expectation of future earnings than past earnings.

These studies, together with our findings, may lead to the conclusion that EPS forecasts, with all their inherent faults, are useless. Although this may be a predictable reaction, it oversimplifies a complex issue. Users of EPS forecasts should not overlook the limitations of forecasts, most significantly that they are not actual results. All three studies cited stress the importance of quantifying the bias and taking it into account when using EPS forecasts.

EPS growth over recent years has driven many successful investment strategies. Decisions based on optimistic EPS forecasts did not matter too much, as companies were able to grow earnings in line with the economy. Some leading investment managers

Table 1: Overestimation of EPS mean of (actual-estimate)/actual, adjusted for outliers

TIME TO ACTUAL	MEAN	HIGH	LOW
0	0.88%	8.66%	-5.90%
	(0.864)	(5.208)	(-4.045)
-1	2.09%	10.05%	-4.88%
	(1.63)	(5.27)	(-3.90)
-2	4.26%	12.66%	-3.63%
	(2.53)	(5.72)	(-2.31)
-3	5.89%	14.91%	-1.27%
	(3.19)	(6.14)	(-0.77)
-4	7.51%	18.88%	-0.30%
	(3.38)	(5.90)	(-0.16)
-5	8.91%	18.95%	0.90%
	(3.93)	(5.64)	(0.47)
-6	12.19%	22.80%	1.80%
	(4.08)	(5.54)	(0.76)
-7	15.68%	25.00%	5.50%
	(4.29)	(5.30)	(1.76)
-8	17.40%	27.85%	6.53%
	(4.37)	(5.92)	(1.75)
-9	18.92%	29.82%	8.02%
	(4.66)	(5.91)	(2.10)
-10	19.79%	32.16%	8.45%
	(4.65)	(5.95)	(2.17)
-11	21.02%	33.70%	7.15%
	(4.65)	(6.22)	(1.85)
-12	22.47%	37.57%	7.02%
	(4.72)	(6.11)	(1.72)
-13	23.16%	39.50%	7.44%
	(4.87)	(6.22)	(1.85)
-14	23.79%	41.87%	7.92%
	(4.61)	(6.64)	(1.66)
-15	24.30%	41.72%	8.27%
	(4.63)	(6.94)	(1.60)
-16	25.39%	43.69%	9.84%
	(4.81)	(6.93)	(2.02)
-17	26.43%	42.56%	11.04%
	(4.94)	(6.61)	(2.26)
-18	25.99%	42.66%	10.82%
	(4.99)	(6.72)	(2.22)
-19	25.69%	44.01%	9.93%
	(4.71)	(7.11)	(1.84)
-20	25.65%	43.64%	9.97%
	(4.65)	(6.68)	(1.85)
-21	24.78%	43.07%	9.50%
	(4.40)	(6.76)	(1.72)
-22	24.41%	43.89%	8.78%
	(4.30)	(6.46)	(1.51)
-23	23.26%	41.85%	7.12%
	(4.13)	(6.20)	(1.26)
Average	17.91%	31.73%	5.42%

have earnings-based investment styles, which have proved successful over this period.

However, in more difficult times, it becomes imperative to make decisions based on realistic expectations of EPS. We believe investors should be asking whether the investment decision is being made on the basis of achievable expectations of EPS.[15]

The EPS forecast data used in this paper were provided by I/B/E/S International Inc to encourage research in the field of earnings expectations.

NOTES

1 The data include forecasts made in FY94/95 and FY95/96 for companies with reporting dates in calendar 1996.

2 Dreman and Berry (1995), p. 39. This is the result for the error metric that calculates excess of actual and consensus forecast EPS over the absolute value of actual EPS. They also calculate other error metrics, including, the excess of consensus forecast EPS as a percentage of the absolute value of consensus forecast EPS and the excess of consensus EPS as a percentage of the past eight-quarter volatility of actual EPS.

3 Dreman and Berry (1995), p. 37. They found that negative surprises tended to be larger under recessionary conditions, implying that analysts are slightly more optimistic in their forecasts in bad times.

4 Dreman and Berry (1995), p. 39.

5 Dreman and Berry (1995), p. 39. They cite this range as that being minimally acceptable to Wall Street professionals.

6 Clayman and Schwarz (1994), p. 67.

7 They cite as evidence that buy recommendations outweigh sell and hold recommendations. Clayman and Schwarz (1994), p. 67.

8 Analyst contact with company management, either at an individual level or at larger briefings, is an important component of the analysts' process. The risk of losing such contact may prompt some analysts to avoid making critical comments about a company.

9 Capstaff *et al* (1996), p. 20.

10 Capstaff *et al* (1996), p. 22. They imply that this means forecasts do not appear to be formed in a rational manner.

11 The companies used in the study were: AMC, ANZ, BHP, BIL, BOR, CBA, CCL, CMC, CML, CSR, FBG, ICI, LLC, MIM, NAB, NBH, NCP, PBL, PDP, PNI, RIO, SRP, SGB, STO, WBC, WES, WFI, WMC, WPL, WOW.

12 The outliers, CMC and MIM, were of such magnitude that they were considered to be aberrations for the purposes of this study. We believe the results excluding the outliers are more representative.

13 We tested the null hypothesis that $\mu = 0$ against the alternative hypothesis that $\mu \neq 0$. t-stats were evaluated at the 95% level of confidence.

14 The 30 stocks selected in the sample are those stocks with probably the highest stockbroker analyst coverage in the Australian market.

15 Care must be taken when using models that compare, for example, consensus EPS forecasts with in-house forecasts. Differences in the treatment of amortisation and goodwill and the calculation of EFPOWA are two areas that may lead discrepancies in EPS calculations (Macquarie Equities, *Dynamics*, November-January 1997).

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