ANALYSTS PREDICTION OF CAPM RESIDUALS

It is important to study analysts forecasts because they are major players in financial markets and consequently we may improve our understanding of how financial markets work. In particular, we may understand what causes the well documented returns anomalies. The Dimson & Marsh is an early paper, but contains a number of significant insights which are still valid.

Dimson and Marsh, "An analysis of brokers' and analysts' unpublished forecasts of UK stock returns", Journal of Finance, December 1984.

1. Background

The D&M paper is a little different, but it is included because it is an important study of UK forecasting by brokers. The paper is about analysts' forecasts of **returns** (not earnings). Analysts were asked to forecast the CAPM residual for a one year period; that is, they are interested in information which analysts have about industry and firm specific movements (that is information over and above that about the returns to the market, and the firm's beta).

$u_{j,t}$	=	the ex post CAPM residual for firm j for one year.
$F_{k,j,t}$	=	analyst k's forecast of the CAPM residual for firm j for one year.

2. Averages

This information is taken from Table III, page 1269

Forecast CAPM residual	mean = 3.6% var = 10.2%
Actual CAPM residual	mean = 1.0% var = 30.9%

There are two conclusions from the averages in this table.

First, the analysts are optimistic. They predicted returns to be more than 3 times as large as what actually occurred.

Secondly, they were also very cautious. The variance of the forecasts is one third of the real variation. Therefore, they do not sufficiently distinguish companies from each other, and do not differ significantly from each. Perhaps this supports the notion that they do not examine companies deeply enough, and do not like to be out of line with their colleagues. This looks like a herd instinct.

3. Regressions

They also regress the actual residual on the forecast

$u_{j,t} = a + b.\ F_{k,j,t} + e_{k,j,t}$ (where $e_{k,j,t}$ is an OLS residual)

The coefficient b then indicates the analysts' (average) forecasting ability = the % of the forecast which gets into prices.

If a=0 and b=1, the this means that the forecast is unbiased (no under or over reaction).

If b > 1, then this means that the forecasts are biased downwards (they are smaller than they should be, and need to be scaled up to match the real errors).

If b < 1, then this means that the forecasts are biased upwards (they are larger than they should be, and need to be scaled down to match the real errors).

The results of the test are as follows.

Regression: Table III
The analysts show small but significant degree of forecasting ability; the value of b = 0.259 (t=5.0), and the R^2 is 0.007. The size of b suggests that analysts overpredict; in line with the averages.

Time horizon: Table III
All forecasts were made notionally for the 12 month period. Even if we discover that this forecast contains information about the future, this does not tell us which month's excess return the analyst has information about. Does the analyst have information about the first few months, the last few months or all months? A clever little test to investigate this was undertaken.

In the regression equation above, the actual return over 12 months was regressed on the forecasted return over the same 12 months. In this test however, the period over which the actual return was measured was varied. The experiment used the 12 month forecasts to explain the excess returns calculated over a shorter period (1,2,3,6) gradually increasing to the full 12 months.

Consider the first result of regressing the 1 month residual on the 12 month forecast. How should this be interpreted? Obviously, the 1 month residual could be just as large as the 12 month residual. But any random variation will be taken up by the error term. The coefficient captures the systematic link between the 1 month residual and the 12 month forecast.

If the forecast contains information about only the first month, then we would expect that the b = 0.269, that is no different from when we regress the 12 month residual on the 12 month forecast. If however, the forecast contains information about only the 12th month, then we would expect that the b = 0. If the forecast contains information about all months equally, then we would expect the coefficient to be one twelfth of 0.269 (that is, 0.022).

The results are as follows.

-actual residual for 1 month regressed on forecast for 12 months	b = 0.124
-actual residual for 2 month regressed on forecast for 12 months	b = 0.132
-actual residual for 3 month regressed on forecast for 12 months	b = 0.148
-actual residual for 6 month regressed on forecast for 12 months	b = 0.197
-actual residual for 12 months regressed on forecast for 12 months	b = 0.269.

Dimson & Marsh find that the 6 months coefficient is 0.197, which is 73% of 0.269. This means that by the time half the forecast period had elapsed, 73 % of the information contained in the forecast had arrived at the market. Even after 1 month, the coefficient is 0.124 which is 46% of 0.269.

This suggests that the forecasts are very short term. Even when analysts are asked to forecast over a year, they are really concentrating on the first few months.