

An Examination of the Economic Rationality of Financial Analysts' Forecasts of Earnings

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I. INTRODUCTION

The concept of rational expectation has recently become the underpinning of many economic variables. Major research efforts have been devoted to the empirical evaluation of the degree of rationality in the expectations of economic variables. However, the main conclusion that emerges from the studies in economic area is that economists' expectations are not formed in a fully rational manner.

The purpose of this study is to examine the property of financial analysts' forecasts (hereafter, FAF) of earnings in terms of rationality. Muth's [1961] criterion for rationality can be applied here in a sense that for a forecast to be rational it must not be biased nor contain a systematic error; furthermore, such a forecast cannot be improved by incorporating past forecasts and realizations. Whether FAF are biased and, if so, in which direction are important questions for investors because (1) investors behave as if their earnings expectations coincide with those of financial analysts (Abdel-khalik and Ajinkya, 1982; Givoly and Lakonishok, 1980), and (2) rationality of FAF is related to the market efficiency. Financial analysts are believed to be "informed" decision makers in the market place because they have a comparative advantage at gathering and/or interpreting economic and industry data. Their behavior leads the decisions of the "uninformed", and makes aggregated market information efficient.

In this study, financial analysts' forecasts of earnings per share (hereafter, EPS) for 752 companies for the years 1980 through 1984 were analyzed. By utilizing three different forecasting time frames (two years before, one year before, and current year), the first and the last forecast of

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each time frame are compared and their differences are determined. It is hypothesized that if forecasts are unbiased, the frequency of positive and negative changes between the two forecasts should be approximately equal.

Following this introduction is a review of relevant studies. Then the data collection procedures are discussed. In the fourth section, the method of analysis is provided. This paper closes with the results of this study and a discussion of the implications.

II. PRIOR STUDIES IN RATIONALITY OF FAF

Although a body of research is available that deals with the accuracy of FAF in Finance and Accounting areas, only the literature directly relevant to the rationality of FAF is summarized in this section.

Barefield and Comiskey (1975) examined analysts' mean forecasts of earnings for 100 companies in the years 1967 through 1972. They found evidence of upward bias in analysts' forecasts. Of 600 forecasts made in six years, 382 were overestimates, 11 were correct, and 207 were underestimates.

Givoly (1982) investigated the time-series behavior and economic rationality of annual FAF of EPS. He concluded that these forecasts appear to be rational, and that the adaptive expectations model seems to describe the formation of annual earnings expectations well.

Fried and Givoly (1982) determined the average relative error of about 1200 mean forecasts made from 1969 to 1979. The average error was calculated by subtracting the prediction from the realized value. Over time, it was significantly negative, indicating an upward bias. However, in 5 of the 11 years the error was positive.

Buchenroth and Jennings (1984) provide evidence on the relative frequency of changes in weekly consensus EPS forecasts reported in the Icarus data base. The results cover the 1978-1983 period for a sample of 805 firms with calendar year fiscal year ends. The consensus measure examined was the mean of the individual analyst forecasts. They concluded that as the forecast horizon lengthens, there are fewer small weekly changes in the weekly consensus earnings forecast and more large changes.

Brown, Foster, and Noreen (1985) examined the behavior of the analysts' mean absolute forecast error in months -22, -18, -14, -10, -6, and -2, where month 0 is the month in which the actual EPS is announced. The data consist of mean EPS forecasts as reported by IBES for about 500 firms over the 1976-1980 period. They found that FAF of EPS become more accurate as the announcement month of the actual EPS is approached. This result is not surprising because as time passes the expansion of information is available to analysts about the conditions that will prevail for the remainder of the horizon period left to forecast.

Elton, Gruber, and Gultekin (1984) studied the sources of security analyst earnings forecast errors. For a sample of IBES firms in the 1976-1978 period, they examined how much of the forecast error is due to the inability of analysts to (1) predict what EPS will be for the economy (ie., for the total firms in the sample), (2) estimate the differential performance of individual industries, and (3) predict how each firm will differ from its industry average. Their conclusion was that the vast majority of error in forecasting arose from misestimates of industry performance and company performance.

III. DATE COLLECTION

At least four publications regularly report EPS forecasts made by group of financial analysts. The four publications are Standard and Poor's *Earnings Forecaster*, Value line's *Investment Service*, the Lynch, Jones and Ryan's *Institutional Brokers Estimation Service*(IBES), and Zacks Investment Researcher's *Icarus Service*. For this study, EAF of EPS were collected from Zacks Investment Researcher's Icarus service. Zacks accumulates up to 60 analyst forecasts for about 2,400 companies and resells them to interested subscribers. The service reports, among other things, analysts weekly average annual EPS forecasts for current fiscal year, for one year ahead, and for two years ahead. From this data base, EPS figures forecasted for the years 1980 through 1984 were collected. To qualify for inclusion in the sample, a company had to meet the following two requirements. First, the company's fiscal year end month must be December.

Second, FAF for the company's annual EPS must be available from the data base for the five year period(1980-1984). After these processes, 752 companies were chosen and used for the final analyses.

IV. METHOD OF ANALYSIS

The changes in the average forecasts over three different forecasting time frames were considered :

1. the two-year period,
2. the year before the fiscal year of earnings being forecasted, and
3. the year of the earnings being forecasted.

The first and the last forecasts of each time frame for a company were compared and their changes were calculated.

If the change was positive, it indicated that , on the average, the analysts revised the forecasts of the EPS figure for this company upward over the time period. If negative, they revised the forecasts downward. This procedure of comparisons was performed for all 752 companies for the three different time frames, and the total number of positive and negtive changes were determined. To test the hypothesis that half of the changes are positive and half of them are negative, a Chi-square proportionality test was utilized.

V. RESULTS

The results for the two-year time frame for the years 1980through 1984 are presented in Table 1 (p. 7). Overall, the hypothesis of equality of positive and negative revisions can be rejected at better than the .1% alpha level. The number of positive revisions is significantly higher than the number of positive revisions. When the sample is broken down to the year of the EPS figure, the hypothesis is rejected for all years except 1982.

The results for the year previous to the year of EPS are presented in Table 2. Here, too, the number of positive revisions is significantly higher than the number of negative revisions. For all the five years considered, the number of positive revisions was consistently higher than the number of

Table 1. Two-Year Forecast Period

Year of EPS Being Forecasted	Number of Positive Revisions	Number of Negative Revisions	Total Revisions	2 X	p
1980	479	257	736	67	p<.0000
1981	457	291	748	37	p<.0000
1982	383	367	750	.3	p>.2
1983	425	319	744	15	p<.0001
1984	445	296	741	30	p<.0000
Total Sample	2189	1530	3179	116	p<.0000

Table 2. One-Year Forecast Period

(in Previous Fiscal Year)

Year of EPS Being Forecasted	Number of Positive Revisions	Number of Negative Revisions	Total Revisions	2 X	p
1980	509	229	738	106	p<.0000
1981	503	237	740	96	p<.0000
1982	502	248	750	86	p<.0000
1983	396	352	748	2.6	p=.021
1984	517	232	749	108	p<.0000
Total Sample	2427	1298	3725	342	p<.0000

Table 3. Current Period Forecast

Year of EPS Being Forecasted	Number of Positive Revisions	Number of Positive Revisions	Total Revisions	2 X	p
1980	313	431	744	19	p<.0001
1981	289	453	742	36	p<.0000
1982	140	597	737	283	p<.0000
1983	430	312	742	19	p<.0001
1984	239	506	745	96	p<.0000
Total Sample	1411	2299	3710	212	p<.0000

negative revisions.

The results for the forecasts of current year EPS are presented in Table 3. Again, overall, the null hypothesis can be rejected at better than the .1% level. However, for this time frame, the number of negative revisions significantly outnumbered the number of positive revisions. When the sample is broken down again yearly, the hypothesis can still be rejected to the same direction, except 1983.

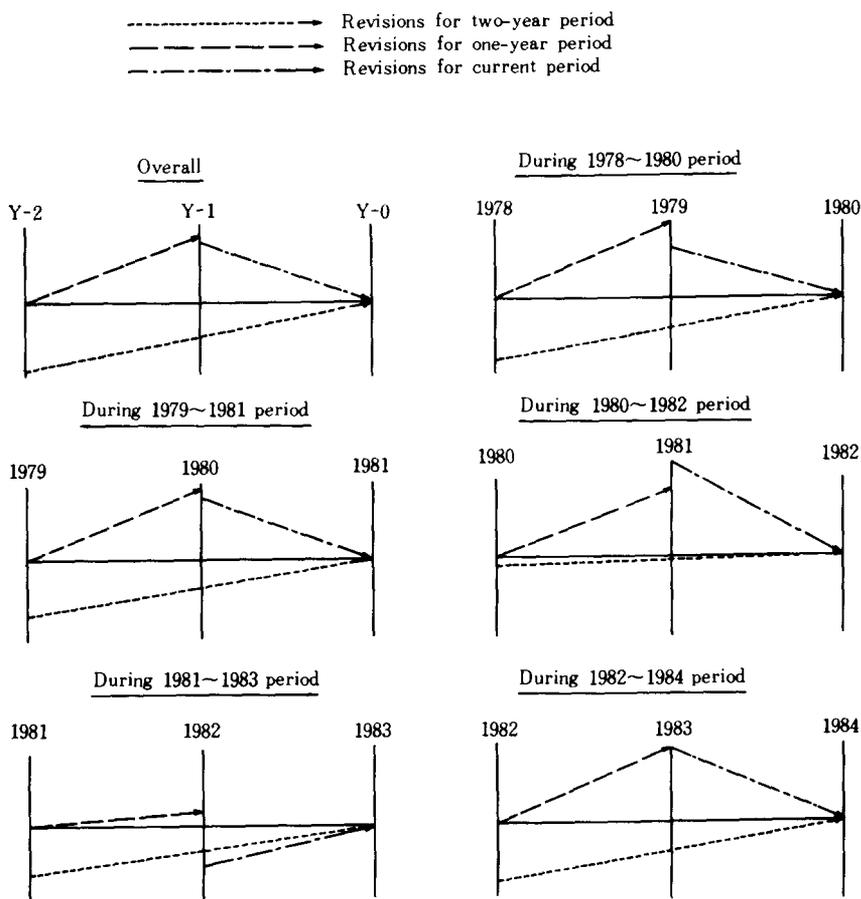
Note that an interesting pattern can be derived from the above results in the formation of analysts' forecasts. At the beginning of the two-year time frame, analysts appear to be conservative and underestimate earnings. Evidence of this is the fact that the number of positive revisions outnumber the number of negative revisions. However, by the end of the first year within the two-year time frame, they have revised their forecasts upward, according to the results in Table 2. But in doing so they overcompensate and, thus, revise forecasts downward during the second year of the two-year time frame. Patterns for the overall and five subperiods are represented in Figure 1 (p. 9).

VI. IMPLICATIONS AND CONCLUSIONS

Most importantly, the results of this study demonstrate that the financial analysts' forecasts are not rational. Even though financial analysts are believed to have the following abilities to (1) incorporate information from many sources, (2) adjust to structural change immediately, and (3) update continually as new information becomes available, their forecast of EPS were found to be biased. The results of this study indirectly support the results of Burefield and Comiskey(1975). Assuming that the last forecast made by analysts is equal to actual earnings, Table 3 indicates that 62 % of the forecasts were overestimates and 38 % were underestimates. Barefield and Comiskey found 64 % and 34 % , respectively.

It is interesting to compare the findings of this study with the results of the studies for the performance of economists'forecasts (Mincer and Zarnowitz, 1969; Ahlers and Lakonishok, 1983). Economists appear to have a downward bias in forecasting general economic variables, such as the level

Figure 1. Patterns in FAF of EPS



of GNP and inflation rates. The results of this study seem to suggest that financial analysts have the same propensity as economists in forecasting EPS.

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