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Continuity of Bias in Management Forecasts and Mispricing

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Abstract

Management's earnings forecasts, an information disclosure practice particular to Japan, may reflect not just information that only management knows but also management's bias. This paper analyzes how close earnings results have actually come to management's forecasts (the achievement ratio), the predictability of the bias in the forecasts, and how well the market recognizes it.

The results of the analysis suggest there may be continuity in the bias in management's forecasts, in that companies with high (low) achievement ratios in the previous year tend to have high (low) achievement ratios in the following year. In addition, the market does not seem to fully recognize the continuity in the achievement ratio, resulting in mispricings. Moreover, an analysis of the relationship between the achievement ratio and earnings surprises suggests that mispricings related to continuity in the achievement ratio may be a different phenomenon from those related to the earnings surprise effect.

Management's forecasts serve a very important purpose in terms of providing management's outlook on business directly to investors. The characteristics of management's forecasts could be a subject of further study so that the forecasts may be used more effectively.

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1. Introduction

Japanese companies issue forecasts for the coming fiscal year, as requested by the stock exchanges. These forecasts are considered useful, as they reflect information that only management knows. Ota (2005), for example, compares management's forecasts with I/B/E/S and Japan Company Handbook estimates and empirically shows that management's forecasts tend to be more accurate than I/B/E/S consensus estimates. Also, Ota (2002) and Nishi & Kaneda (2005) suggest that analysts' estimates may be affected by management's forecasts. Ota (2002) shows that management's forecasts have greater explanatory power for stock prices and stock returns than shareholders' equity and net income do.

One problem with management's forecasts, however, is that they reflect management's bias. Koch (1999), Irani (2000), and Nishi & Kaneda (2005), for example, show that financially weak companies tend to come up with optimistic earnings forecasts because they have incentives to present business conditions in a favorable light to obtain the financing they need.

Not only financially struggling companies but also other companies have such incentives to give a favorable slant, even slightly, to the outlook for their earnings, particularly if they anticipate needing to raise debt or undertake equity financing. Management's forecasts may also reflect factors particular to the company and the executives. Some companies tend to come up with earnings forecasts that are similar to targets, while others regularly come up with optimistic figures or solid but very conservative forecasts.

The conditions that companies face and the executives who lead companies do not change that frequently. Consequently, if management's forecasts have a bias, then companies that come up with optimistic forecasts could be expected to continue to do so, and likewise those companies that come up with conservative forecasts are likely to continue to do so.

This paper looks at the continuity of the bias in management's forecasts by using an achievement ratio, which measures how close earnings results have actually come to the forecasts. The results of the analysis show that those stocks with high (low) achievement ratios in the past tend subsequently to have high (low) achievement ratios. This paper also analyzes whether the stock market properly recognizes the continuity of the achievement ratio. The impact that management's forecasts have on analysts' estimates has already been mentioned by Ota (2002) and Nishi & Kaneda (2005), but the impact that the bias of management's forecasts has on analysts' estimates was not considered. Muramiya (2005) focuses on the difference between management's forecasts and actual results and shows a negative correlation between the accuracy of management's forecasts and the cost of capital, but also does not analyze the impact that continual bias in management's forecasts has on prices. This paper thus analyzes how this bias has been regarded in the market. The results of the analysis suggest that the market does not properly recognize the continuity of the achievement ratio after companies announce their earnings forecasts, and that consequently stocks may be mispriced.

Ota (2006) discusses the bias in management's net income forecasts and how the market sees it. The study of the difference between management's net income forecasts and the actual results for all Japanese publicly traded stocks (including OTC stocks) from 1979 to 1999 shows that the bias in management's forecasts has continuity. It also empirically confirms that the expected bias in management's forecasts at certain points in time, based on this continuity, has predictive power for subsequent stock returns. The results of the analysis here are consistent with those of Ota (2006), although the studies are based on different sample periods, universes, and methodologies. The analysis in this paper also confirms that management's sales and recurring income forecasts exhibit the same continuity of bias as their net income forecasts and that the

market has not properly recognized this continuity. Moreover, an analysis of the relationship between these effects and earnings surprises suggests that mispricings of the bias in management's forecasts may be a different phenomenon from those related to the surprise effect.

This paper is structured as follows.

In section 2, the achievement ratio is defined as an indicator for measuring the bias in management's forecasts. In section 3, the continuity of the achievement ratio is analyzed to see whether the bias in management's forecasts has the type of continuity in the hypothesis above. In section 4, whether the stock market properly recognizes the continuity of the achievement ratio is analyzed based on the trend in consensus earnings estimates and share price performance. In section 5, the correlation between performance differences stemming from the achievement ratio and the impact of surprising earnings forecasts is analyzed. The paper is concluded with a summary in section 6.

2. Definition of the Achievement Ratio

The difference between management's earnings forecasts and actual results is analyzed here to see whether the forecasts have a bias and whether they are optimistic or conservative. Specifically, to measure how close earnings results have actually come to the forecasts, the sales, recurring income, and net income achievement ratios $ACV_{i,t}$ for company i in fiscal period t are defined as follows:

$$ACV_{i,t}^{sales} = \frac{Act_{i,t}^{sales} - MF_{i,t,0}^{sales}}{MF_{i,t,0}^{sales}} \qquad ACV_{i,t}^{income} = \frac{Act_{i,t}^{income} - MF_{i,t,0}^{income}}{\left|Equity_{i,t-1}\right|} \qquad ACV_{i,t}^{netincm} = \frac{Act_{i,t}^{netincm} - MF_{i,t,0}^{netincm}}{\left|Equity_{i,t-1}\right|}$$

$Act_{i,t}^{sales}$, $Act_{i,t}^{income}$, $Act_{i,t}^{netincm}$, and $Equity_{i,t}$ represent actual sales, actual recurring income, actual net income, and actual shareholders' equity for company i in fiscal period t. $MF_{i,t,0}$ represents management's initial forecasts for company i in fiscal period t. An achievement ratio of 0 indicates that the actual results were the same as management's forecasts. On average, the achievement ratio of a company with bullish or optimistic forecasts is negative, and that of a company with conservative forecasts is positive.

The universe for our analysis consists of nonfinancial companies listed on the first section of the Tokyo Stock Exchange with fiscal years ending in March. Companies that have merged with another in a particular fiscal year are excluded from the analysis in that fiscal year. The sample period covers the 11 years from March 1996 to March 2006. Where possible, consolidated figures for forecasts and financial data are used; otherwise, parent figures are used[2].

Exhibit 1 shows a distribution of the achievement ratios for our universe of companies by fiscal year. To exclude the impact of outliers, however, the highest and lowest 3% of the companies in terms of achievement ratios are excluded.

The overall average achievement ratio for 1996–2006 is about –1%, which suggests that management's forecasts had an optimistic bias on average. The average achievement ratio, however, differs substantially from fiscal year to fiscal year. In fiscal 2001 (ended March 2002), the median achievement ratio for sales was –5.04%, that for recurring income –3.10%, and that for net income –3.28%. The change in the overall average achievement ratio probably stems

[2] *All management's forecasts and financial data are from Nomura Research Institute's Integrated Data Service.*

mainly from macro factors. In 2005 and 2006, the average and median achievement ratios were positive, reflecting a better-than-expected overall rebound in corporate earnings.

Exhibit 1 Distribution of achievement ratios

FY	Sales achievement				Recurring profit achievement				Net profit achievement			
	Average (%)	Median (%)	St. dev. (%)	Samples	Average (%)	Median (%)	St. dev. (%)	Samples	Average (%)	Median (%)	St. dev. (%)	Samples
1996.3	-0.13	-0.31	4.82	803	0.18	0.19	3.15	801	-0.21	0.04	2.67	800
1997.3	3.79	3.08	6.39	889	0.77	0.63	4.57	889	0.01	0.03	4.11	888
1998.3	-1.18	-1.05	4.16	911	-0.56	-0.28	2.23	911	-0.81	-0.28	2.36	909
1999.3	-0.79	-0.77	4.01	898	-0.74	-0.29	2.54	898	-1.11	-0.35	3.16	897
2000.3	-2.36	-1.73	4.77	918	-1.87	-0.61	4.10	918	-2.94	-0.94	5.85	918
2001.3	-4.23	-3.40	4.92	954	-2.45	-1.35	4.51	954	-3.73	-1.05	9.46	954
2002.3	-6.06	-5.04	6.54	997	-4.99	-3.10	6.84	996	-7.03	-3.28	10.46	996
2003.3	-1.97	-1.66	5.43	1048	-1.17	-0.23	4.73	1046	-3.54	-1.30	7.01	1047
2004.3	-2.60	-2.57	5.58	1050	-2.92	-1.47	4.75	1045	-4.69	-1.82	8.70	1048
2005.3	1.45	0.85	5.78	1116	0.90	0.57	4.61	1112	0.07	0.37	4.21	1113
2006.3	1.72	1.35	5.73	1130	0.65	0.51	4.09	1127	0.23	0.40	3.76	1129
Average	-1.12	-1.02	5.28	974	-1.11	-0.49	4.19	972	-2.16	-0.74	5.61	973

Note: (1) Distribution of achievement ratios by fiscal year for nonfinancial companies listed on the first section of the Tokyo Stock Exchange with fiscal years ending in March. (2) To exclude the impact of outliers, however, the highest and lowest 3% of the companies in terms of achievement ratios are excluded.
Source: Nomura

3. Continuity of the Achievement Ratio

If management's forecasts reflect a bias owing to the particular characteristics of the company or the executives, then the bias most likely has staying power because the conditions that companies face and the executives who lead companies do not change that frequently. If this hypothesis is valid, then those companies with high (low) achievement ratios (defined earlier) in the past could be expected subsequently to have high (low) achievement ratios, on average. In this paper, the achievement ratio is used to try to determine whether the bias in management's forecasts has such continuity.

3. 1. Grouping simulation

To analyze the continuity of the achievement ratio, a grouping simulation is first done in the following manner. First, the companies in the universe are placed into 10 equal groups based on fiscal 1995 achievement ratios. The median achievement ratios in each of the subsequent three fiscal years are then determined for each group. The medians for the entire universe are excluded to factor out the impact of changes in overall achievement ratios owing to fiscal years. The analysis is repeated for each fiscal year until fiscal 2002. Finally, the group medians are averaged by group and period and the results across the groups are compared.

The results are shown in **Exhibit 2**, and the sales achievement ratios are graphed in **Exhibit 3**.

For group 1, which consists of those with the lowest sales achievement ratios in the current fiscal year, the median achievement ratios in the three subsequent fiscal years are –3.49%, –1.77%, and –1.42%, which are all statistically significant at the 5% confidence level, indicating that the group continued subsequently to have the lowest achievement ratios. The same trend holds for the recurring income and net income achievement ratios. In addition, those companies with high (low) achievement ratios in a particular fiscal year tend subsequently to have high

(low) achievement ratios on average. Consistent with the hypothesis, these results show that the achievement ratios of management's forecasts have continuity, management's forecasts probably reflect a bias, and this bias has continuity.

However, group 10, which consists of those with the highest net income achievement ratios, did not have subsequent achievement ratios that were that high. One reason may be that the group may include companies with achievement ratios temporarily boosted by extraordinary gains or other factors.

Exhibit 2 Trends in achievement ratios by group

Sales achievement		(Lower)			FY1 Sales achievement					(Higher
		1	2	3	4	5	6	7	8	9	10
FY1	Ach. (%)	-11.50	-6.08	-3.59	-2.03	-0.66	0.59	1.74	3.13	5.18	10.66
FY2	Ach. (%)	-3.49	-1.70	-1.02	-0.76	-0.32	0.44	1.02	0.95	1.16	1.46
	t value	(-4.93) **	(-6.77) ***	(-3.84) **	(-3.27) *	(-1.31)	(2.13)	(5.72) ***	(4.10) **	(3.15) *	(3.30) *
FY3	Ach. (%)	-1.77	-0.92	-0.46	-0.02	-0.17	0.28	0.56	0.44	0.65	0.78
	t value	(-3.42) *	(-2.78) *	(-1.99)	(-0.07)	(-1.08)	(1.54)	(2.21)	(1.36)	(2.73) *	(1.67)
FY4	Ach. (%)	-1.42	-0.57	-0.28	-0.12	0.07	-0.04	0.22	0.38	0.83	0.81
	t value	(-3.14) *	(-1.50)	(-0.83)	(-0.52)	(0.39)	(-0.13)	(0.82)	(1.59)	(2.73) *	(2.16)

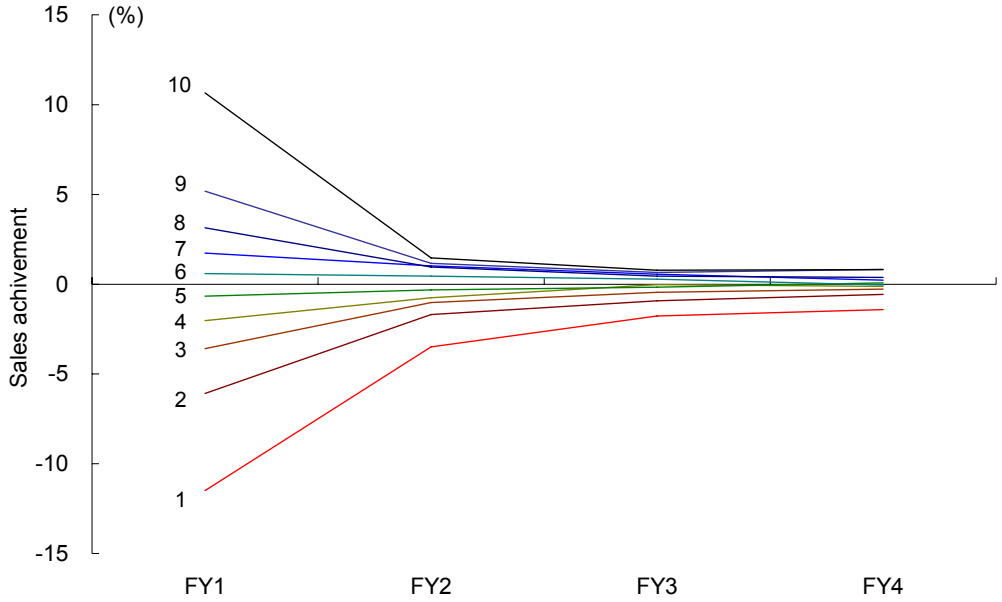
Recurring profit achievement		(Lower)			FY1 Recurring profit achievement					(Higher)
		1	2	3	4	5	6	7	8	9	10
FY1	Ach. (%)	-12.54	-4.59	-2.44	-1.21	-0.35	0.28	0.88	1.58	2.72	6.46
FY2	Ach. (%)	-5.57	-1.95	-0.81	-0.19	-0.03	0.43	0.62	0.78	0.91	0.69
	t value	(-4.48) **	(-5.14) **	(-2.85) *	(-3.05) *	(-0.37)	(1.85)	(2.99) *	(4.97) **	(3.88) **	(3.16) *
FY3	Ach. (%)	-3.39	-1.06	-0.23	-0.08	0.13	0.27	0.34	0.36	0.52	0.40
	t value	(-3.72) **	(-1.97)	(-1.53)	(-0.64)	(1.38)	(1.96)	(2.21)	(1.97)	(4.84) **	(1.79)
FY4	Ach. (%)	-2.78	-0.70	0.14	0.00	0.05	0.29	0.21	0.39	0.40	0.18
	t value	(-3.59) **	(-3.00) *	(0.93)	(-0.02)	(0.41)	(1.93)	(1.91)	(2.55) *	(2.14)	(1.46)

Net profit achievement		(Lower)			FY1 Net profit achievement					(Higher)
		1	2	3	4	5	6	7	8	9	10
FY1	Ach. (%)	-20.05	-5.65	-2.57	-1.15	-0.30	0.24	0.71	1.19	2.06	5.45
FY2	Ach. (%)	-9.76	-2.12	-1.03	-0.22	0.18	0.28	0.67	0.58	0.65	0.41
	t value	(-2.64) *	(-2.29)	(-2.95) *	(-1.88)	(1.32)	(2.34)	(3.34) *	(3.93) **	(4.32) **	(1.33)
FY3	Ach. (%)	-4.34	-1.32	-0.51	-0.16	0.21	0.32	0.41	0.45	0.42	-0.10
	t value	(-3.00) *	(-1.97)	(-2.31)	(-1.03)	(1.30)	(2.63) *	(1.87)	(2.65) *	(2.41) *	(-0.31)
FY4	Ach. (%)	-3.92	-0.67	-0.19	0.11	0.37	0.21	0.22	0.31	0.04	0.20
	t value	(-2.83) *	(-1.93)	(-1.41)	(1.29)	(4.54) **	(1.86)	(2.16)	(1.83)	(0.35)	(1.78)

Note: (1) Medians and t-statistics for achievement ratios in subsequent three years for groups of companies based on achievement ratios in the current fiscal year. (2) The t-statistics are for the null hypothesis that the expected value is 0. (***) indicates statistical significance (with a two-tailed test) at the 0.1% level, (**) at the 1% level, and (*) at the 5% level.

Source: Nomura

Exhibit 3　Trends in sales achievement ratios by group



Note: (1) Medians for achievement ratios in subsequent three years for groups of companies based on achievement ratios in the current fiscal year. (2) For nonfinancial companies listed on the first section of the Tokyo Stock Exchange with fiscal years ending in March. .
Source: Nomura

3. 2. Regression analysis testing

In the previous section, a grouping simulation was used to analyze the continuity of the achievement ratios of management's forecasts. In this section, a regression analysis is used as another test of the continuity of achievement ratios. A cross-sectional regression of company-specific achievement ratios is conducted against the achievement ratios in the previous fiscal year, based on the following equation:

$$ACV_{i,t} = \alpha + \beta\, ACV_{i,t-1} + \varepsilon_{i,t}$$

To exclude the impact of outliers, however, the highest and lowest 3% of the companies in terms of achievement ratios are excluded from the sample. Also, a separate regression is done using data for the entire period and the following equation, which adds a fiscal year dummy variable $I_{t,j}$ to the independent variables in the above equation to factor in differences in average achievement ratios owing to fiscal years.

$$ACV_{i,t} = \beta\, ACV_{i,t-1} + \sum_{j=1997}^{2006} \beta_j I_{t,j} + \varepsilon_{i,t}$$

The results are shown in **Exhibit 4**. The regression coefficients are positive and statistically significant at the 5% level in all periods, and positive and statistically significant at the 0.1% level in almost all periods. This regression analysis thus also shows the continuity of achievement ratios. Specifically, a high (low) achievement ratio in a particular fiscal year tends also to be high (low) in the following year[3]. In the case where data for the entire period are used,

[3] *A regression analysis (not included here) was also done using a sector dummy variable (based on the Tokyo Stock Exchange's 33-sector classification and Nomura's 19-sector classification) to minimize differences in achievement ratios stemming from sector, but the results were not substantially different, indicating that the results shown here are robust.*

the regression coefficient for the net income achievement ratio is 0.38, close to the 0.348 result from Ota (2006), which is based on a similar analysis. These results are thus consistent with those for net income in Ota (2006) and also support the hypothesis regarding sales and recurring income achievement ratios.

Exhibit 4 Results of regression analysis of achievement ratios in consecutive years

	Sales achievement						No.of samples
FY	Const.	(t)		Coefficient	(t)		R2	
1997	3.73	18.00	***	0.36	8.18	***	0.33	767
1998	-1.83	-11.58	***	0.19	8.61	***	0.15	843
1999	-0.85	-6.37	***	0.14	4.52	***	0.09	867
2000	-1.86	-11.77	***	0.21	5.29	***	0.19	853
2001	-3.55	-19.91	***	0.22	6.35	***	0.44	868
2002	-4.70	-17.17	***	0.34	7.62	***	0.50	903
2003	-1.27	-5.41	***	0.11	4.10	***	0.13	944
2004	-2.04	-10.94	***	0.10	3.13	**	0.15	993
2005	1.61	8.14	***	0.08	2.42	*	0.06	994
2006	1.16	6.97	***	0.36	12.72	***	0.20	1061
Pool				0.19	18.49	***	0.20	9092

	Recurring profit achievement						No.of samples
FY	Const.	(t)		Coefficient	(t)		R2	
1997	0.49	3.42	***	0.35	7.41	***	0.08	771
1998	-0.74	-10.13	***	0.19	11.55	***	0.19	862
1999	-0.63	-7.50	***	0.33	8.48	***	0.16	877
2000	-1.56	-11.12	***	0.34	6.10	***	0.20	857
2001	-1.70	-10.73	***	0.34	9.38	***	0.28	877
2002	-3.79	-15.69	***	0.51	10.10	***	0.42	915
2003	-0.29	-1.52		0.24	10.11	***	0.16	956
2004	-2.10	-17.34	***	0.52	20.32	***	0.49	1003
2005	0.99	5.97	***	0.08	2.39	*	0.04	994
2006	0.28	2.37	*	0.35	13.74	***	0.17	1068
Pool				0.33	31.35	***	0.24	9175

	Net profit achievement						No.of samples
FY	Const.	(t)		Coefficient	(t)		R2	
1997	-0.03	-0.22		0.13	2.55	*	0.01	771
1998	-0.87	-10.30	***	0.30	13.51	***	0.26	857
1999	-0.88	-7.69	***	0.36	6.82	***	0.15	875
2000	-2.62	-12.06	***	0.41	6.15	***	0.23	856
2001	-2.97	-8.36	***	0.20	3.62	***	0.14	873
2002	-6.22	-16.94	***	0.30	7.50	***	0.35	906
2003	-1.84	-6.40	***	0.31	11.65	***	0.29	954
2004	-0.86	-5.17	***	1.16	52.54	***	0.79	1016
2005	0.20	1.31		0.06	3.84	***	0.01	999
2006	0.08	0.73		0.23	8.03	***	0.06	1077
Pool				0.38	34.63	***	0.28	9171

Note: (1) The t-statistics are for the null hypotheses that the constant term and regression coefficients are 0. (***) indicates statistical significance (with a two-tailed test) at the 0.1% level, and (**) at the 1% level.
Source: Nomura

4. The Stock Market's Recognition of the Continuity of Achievement Ratios

4. 1. Hypothesis

The results of the two analyses in the previous sections indicate that the achievement ratios of management's forecasts have continuity. This finding suggests that achievement ratios in the previous fiscal year can be used to forecast achievement ratios in the following fiscal year to some extent. The issue, then, is whether the stock market properly recognizes the continuity of achievement ratios.

That achievement ratios have continuity means that companies with high (low) achievement ratios in the previous fiscal year have subsequent earnings results that exceed (fall short of) management's initial forecasts on average[4]. Hence, if the market properly recognizes the continuity of achievement ratios, then consensus earnings estimates for companies with high (low) achievement ratios in the previous fiscal year should be higher (lower) than

[4] *In the discussion here, "exceed management's initial forecasts" is used in comparison with the market average. When the overall market's achievement ratio is negative, the achievement ratio itself may be negative, and vice versa. The same applies hereinafter, unless otherwise noted.*

management's forecasts, even if the consensus estimates are close to management's forecasts on average, as pointed out by Ota (2002). Williams (1996), a study of the relationship in the US market between the past accuracy of management's forecasts and the extent to which analysts revise their estimates after companies come out with their earnings forecasts, shows that the accuracy of management's forecasts affects analysts' confidence in the forecasts. Hirst et. al. (1999) similarly shows, based on a study involving students, that the accuracy of management's forecasts affects investors' confidence in the forecasts. If the market properly recognizes the continuity of achievement ratios as mentioned above, the achievement ratios of management's forecasts would not have any additional predictive power for returns because the information would have already been priced into stocks.

Conversely, if the market does not properly recognize the continuity of achievement ratios and earnings estimates and share prices are based on management's forecasts, then past achievement ratios of management's forecasts might have some additional predictive power for returns. In other words, if investors were to take such action, then the consensus earnings estimates after management's forecasts are released would be close to management's forecasts on average, regardless of past achievement ratios. If stocks are priced based on such forecasts, then those stocks with consistently high (low) achievement ratios would be undervalued (overvalued). It is likely, though, that the extent to which management's forecasts, used for pricing, are ultimately achieved can be gradually forecast based on company trends and analysts' estimate revisions after the forecasts are announced and until results are announced in the following year, and becomes clear when results are announced. As it becomes clear how close results are likely to come to management's forecasts, stocks of companies with high (low) achievement ratios for the previous fiscal year and thus likely to have high (low) achievement ratios for the current fiscal year could be expected to benefit (be hurt) as they become less undervalued (overvalued).

Based on the above, if investors price stocks without sufficiently recognizing the continuity of achievement ratios, then two phenomena would probably be observable. The first is that consensus earnings estimates would be close to management's forecasts immediately after the latter are announced, regardless of past achievement ratios, and as they are revised over time, the achievement ratios for the current fiscal year would gradually become apparent. The second is that return differentials attributable to past achievement ratios would be observable because mispricings immediately after management's forecasts are announced would be corrected as the achievement ratios for the current fiscal year gradually become apparent.

Muramiya (2005) empirically demonstrates that the less accurate management's forecasts are, the higher the cost of capital tends to be. This finding suggests that the accuracy of management's forecasts is priced into stocks. Muramiya (2005), however, does not analyze whether the market properly recognizes the bias in management's forecasts or the proxy, the achievement ratios, because the study ignores the bias in management's forecasts. In this section, this point is analyzed and the two hypotheses laid out earlier are tested.

4. 2. Trends in consensus earnings estimates after management's forecasts are announced

(1) Analysis of consensus earnings estimates

Here, how the market's expectations of the achievement ratios for the current fiscal year change over time after management's forecasts are announced is analyzed, based on the following method.

First, it is assumed that companies with fiscal years ending in March, which make up our universe, announce their earnings results for the latest fiscal year and forecasts for the next fiscal year in May. At end-May, which is regarded here as "immediately after management's forecasts are announced," the stocks in the universe are divided into five groups based on the achievement ratios for the previous fiscal year. Then, for each group, the extent of the difference between analysts' consensus estimates and management's initial forecasts at the end of each month from June to the following May is analyzed. This difference *n* months after management's initial forecasts are announced, $ESTDEV_{i,t,n}$, is defined as the same as the achievement ratio except actual results are replaced by analysts' consensus estimates, as shown below

$$ESTDEV_{i,t,n}^{sales} = \frac{AnalystEst_{i,t,n}^{sales} - MF_{i,t,0}^{sales}}{MF_{i,t,0}^{sales}} \qquad ESTDEV_{i,t,n}^{netincm} = \frac{AnalystEst_{i,t,n}^{netincm} - MF_{i,t,0}^{netincm}}{\left|Equity_{i,t-1}\right|}$$

and the group median is regarded as the value for the group. $MF_{i,t,0}$ represents management's initial forecasts for company *i* at time *t*, and $AnalystEst_{i,t,n}$ represents analysts' consensus estimates n months after management's initial forecasts are announced. This procedure is repeated for fiscal 1996 to fiscal 2005, the average is calculated for each group, and the groups are then compared. Where possible, I/B/E/S consensus estimates for analysts' estimates are used; otherwise Toyo Keizai estimates are used.

(2) Results of analysis of consensus earnings estimates

The deviations in analysts' estimates for each group 0, 3, 6, 9, and 11 months after management's initial forecasts are announced are shown in **Exhibit 5**. A graph of the results for sales estimates is shown in **Exhibit 6**.

The results show very small deviations immediately after management's initial forecasts are announced for all of the groups. In other words, analysts' consensus estimates and management's forecasts practically match on average. This finding confirms that of Ota (2002), which found that analysts' estimates are affected by management's forecasts. It also suggests that analysts' estimates at this point in time do not reflect the continuity of achievement ratios and that analysts' estimates in Japan do not reflect the accuracy of management's forecasts the way they do in the US market, as demonstrated by Williams (1996). The result is consistent with the hypothesis, and if stocks are priced based on these estimates, then the continuity of achievement ratios may not be priced into stocks immediately after management's forecasts are announced.

It should also be apparent from **Exhibit 6** that companies with low achievement ratios for the previous fiscal year have analysts' estimates that tend to be revised downward, primarily one to two quarters after management's forecasts are announced. Based on the continuity of achievement ratios, companies with low achievement ratios for the previous fiscal year can be expected to have low achievement ratios for the current fiscal year also, on average, but the result suggests that the likely achievement ratios for the current fiscal year, based on the

continuity of achievement ratios, gradually become clear about three months after management's forecasts are announced, not immediately after[5].

In sum, the results indicate that the continuity of achievement ratios is not reflected in analysts' estimates immediately after management's forecasts are announced and gradually becomes clear thereafter. This finding, which is consistent with the previously noted hypothesis, suggests that the market does not properly recognize the continuity of achievement ratios.

Exhibit 5 Number of months after announcement of management's forecasts and analysts' estimates

Months		(Lower) 1	2	Sales achievement 3	4	(Higher) 5
0	Deviation (%)	-0.10	0.00	0.00	0.00	0.00
	Relative (%)	-0.10	0.00	0.00	0.00	0.00
	t value	(-1.00)	(-)	(-)	(-)	(-)
3	Deviation (%)	-0.12	-0.08	-0.06	-0.18	-0.06
	Relative (%)	-0.05	-0.02	0.01	-0.11	0.01
	t value	(-0.47)	(-0.12)	(0.97)	(-0.64)	(0.13)
6	Deviation (%)	-1.30	-0.93	-0.56	-0.45	-0.07
	Relative (%)	-0.72	-0.36	0.02	0.12	0.50
	t value	(-2.40) *	(-2.10)	(0.14)	(0.79)	(1.90)
9	Deviation (%)	-2.16	-1.47	-1.10	-0.44	-0.12
	Relative (%)	-1.11	-0.42	-0.05	0.61	0.93
	t value	(-3.85) **	(-2.26)	(-0.51)	(2.34) *	(2.72) *
11	Deviation (%)	-2.21	-1.76	-1.29	-0.71	-0.35
	Relative (%)	-0.93	-0.49	-0.02	0.56	0.92
	t value	(-2.54) *	(-1.95)	(-0.13)	(1.96)	(3.46) **

Months		(Lower) 1	2	Recurrent profit achievement 3	4	(Highe 5
0	Deviation (%)	-0.09	0.00	0.00	0.00	0.04
	Relative (%)	-0.08	0.00	0.00	0.00	0.04
	t value	(-1.48)	(-)	(-)	(-)	(1.35)
3	Deviation (%)	-0.05	0.00	0.05	0.04	0.19
	Relative (%)	-0.06	-0.02	0.04	0.03	0.17
	t value	(-1.76)	(-0.65)	(1.88)	(0.41)	(1.42)
6	Deviation (%)	-0.78	-0.44	-0.09	0.07	0.28
	Relative (%)	-0.61	-0.26	0.08	0.24	0.45
	t value	(-1.74)	(-2.58) *	(1.80)	(1.76)	(2.16)
9	Deviation (%)	-1.43	-0.64	-0.25	0.00	0.31
	Relative (%)	-1.07	-0.28	0.11	0.36	0.67
	t value	(-2.25)	(-4.08) **	(1.88)	(3.11) *	(2.63) *
11	Deviation (%)	-1.47	-0.76	-0.28	-0.04	0.28
	Relative (%)	-1.09	-0.38	0.11	0.34	0.66
	t value	(-2.19)	(-2.90) *	(1.41)	(3.04) *	(3.44) **

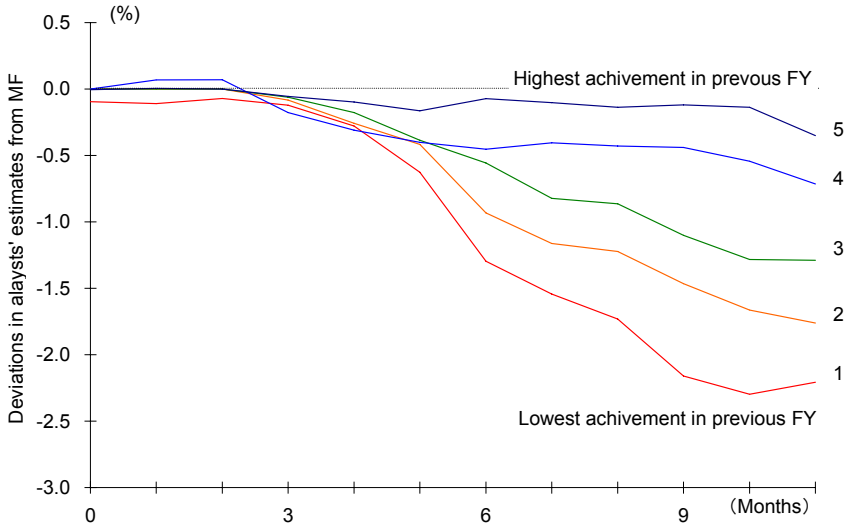
Months		(Lower) 1	2	Net profit achievement 3	4	(Higher) 5
0	Deviation (%)	-0.03	0.03	0.02	0.00	0.02
	Relative (%)	-0.03	0.03	0.02	0.00	0.02
	t value	(-1.03)	(1.27)	(0.95)	(-)	(0.99)
3	Deviation (%)	0.01	0.03	0.07	0.10	0.20
	Relative (%)	-0.04	-0.02	0.02	0.05	0.15
	t value	(-2.96) *	(-1.68)	(1.10)	(1.97)	(1.94)
6	Deviation (%)	-0.41	-0.21	-0.07	0.08	0.15
	Relative (%)	-0.31	-0.12	0.02	0.17	0.25
	t value	(-2.94) *	(-1.44)	(0.67)	(2.76) *	(2.26)
9	Deviation (%)	-0.83	-0.37	-0.22	0.00	0.09
	Relative (%)	-0.57	-0.12	0.04	0.26	0.35
	t value	(-2.37) *	(-1.20)	(0.55)	(3.08) *	(2.07)
11	Deviation (%)	-1.21	-0.55	-0.28	-0.06	-0.10
	Relative (%)	-0.85	-0.19	0.08	0.30	0.26
	t value	(-2.32) *	(-1.39)	(1.04)	(3.49) **	(2.32) *

Note: (1) The figures for "Relative" represent the difference with the median deviation for the universe, and the t-statistics are for the null hypothesis that the difference with the median deviation for the universe is 0. (2) (***), (**), and (*) indicate statistical significance (with a two-tailed test) at the 0.1%, 1%, and 5% levels, respectively. (3) In the case where the deviation is the same in all fiscal years, the t-statistic is replaced by "-". (4) The higher the group number, the higher the achievement ratio for the previous fiscal year (5 = highest, 1 = lowest).

Source: Nomura

[5] *The tendency for analysts' consensus estimates to be revised several months after management's forecasts are announced may be substantially affected by management's forecast revisions, including those at the time of first-half results. The impact of management's forecast revisions on the results in this paper could be a subject of further study.*

Exhibit 6 Trend in analysts' sales estimates one year after management's forecasts are announced



Note: (1) Deviations between analysts' sales estimates and management's initial forecasts one year after management's forecasts are announced. (2) X-axis: Number of months after the announcement of management's forecasts. (3) The higher the group number, the higher the achievement ratio for the previous fiscal year (5 = highest, 1 = lowest).
Source: Nomura

4. 3. Analysis of mispricings

(1) Analysis of mispricings

The results in the previous section were consistent with the first hypothesis, namely that analysts' estimates do not reflect the continuity of achievement ratios immediately after management's forecasts are announced and are gradually revised thereafter. This point indicates that the continuity of achievement ratios is generally not properly discounted immediately after management's forecasts are announced and that return differentials, stemming from differences in achievement ratios for the previous fiscal year, subsequently arise. This hypothesis is tested in this section.

Immediately after earnings results for the previous fiscal year and management's forecasts for the current fiscal year are announced, the companies in the universe are divided into groups based on the achievement ratios for the previous fiscal year, with the average performance of the stocks of companies in each group over the subsequent 12 months then compared. If the above hypothesis is valid, then a portfolio consisting of stocks of companies with high achievement ratios for the previous fiscal year could be expected to outperform a portfolio consisting of stocks of companies with low achievement ratios for the previous fiscal year.

The specifics of the analysis are as follows.

The universe consists of nonfinancial companies listed on the first section of the Tokyo Stock Exchange with fiscal years ending in March. Achievement ratios for the previous fiscal year can be calculated at end-May because most earnings releases come out by then. The companies in the universe are then divided at end-May into five equal groups based on the sales, recurring income, and net income achievement ratios for the previous fiscal year. The equal-weighted returns of these groups are calculated for each month over the next 12 months (until end-May of the following year). This process is repeated for each year, and then the group returns relative to

the benchmark are compared. The benchmark is an equal-weighted portfolio of all the stocks in the universe, and returns are total (including dividends).

The sample period is from June 1996 (the first sort is at end-May 1996) to May 2006 (10 years). The groups are diversified by sector, based on Nomura's 19-sector classification, to minimize differences in achievement ratios stemming from sector. Specifically, companies within each sector are divided into five groups based on achievement ratios, and then these groups are combined with other groups of the same rank to form the final five groups.

(2) Results of the analysis

Exhibit 7 shows the group returns relative to the benchmark, based on an analysis using achievement ratios for sales, recurring income, and net income. The measurement period for monthly returns in the exhibit represents the number of months after management's forecasts are announced. For example, 0–3 means the return in the first three months immediately after management's forecasts are announced. The 12-month group returns relative to the benchmark based on an analysis using achievement ratios for sales are shown in **Exhibit 8.** Returns relative to the benchmark, however, are defined here as the cumulative return of each group divided by the cumulative return of the benchmark, and are indexed to 100 as of the starting point. The x-axis shows the number of months after management's forecasts are announced (when stocks are sorted into groups); 0 means end-May and 12 means and end-May of the following year.

Groups 4 and 5 (high sales, recurring income, and net income achievement ratios for the previous fiscal year) outperformed groups 1 and 2 (low achievement ratios). For example, group 5 based on sales achievement ratios had an excess return in the 12 months after management's forecasts were announced (denoted as 0-12 in the exhibit) of 3.39%, more than 6 percentage points better than the excess return of –2.93% for group 1 (the lowest achievement ratios). Similarly, the differences in 12-month returns between the top and bottom groups in terms of recurring income and net income achievement ratios are 5–6 percentage points. This result is as expected, supports the hypothesis that the pricing of stocks does not reflect the continuity of achievement ratios, and is consistent with the finding in Ota (2006) of a 4.5 percentage point difference in returns between the top and bottom groups in terms of net income estimates, based on a similar analysis.

However, the exhibits show that the above trend for the returns of the groups with the highest and lowest achievement ratios holds mainly in the first six months after the achievement ratios for the previous fiscal year become available (time period 0–6). There is no appreciable difference in returns in the subsequent six months (time period 6–12). In **Exhibit 7**, the difference in returns, based on sales, recurring income, or net income achievement ratios, is most significant for the six months after management's forecasts are announced and is not statistically significant in the subsequent six months. The results indicate that information on likely achievement ratios for the following fiscal year, based on the ratios for the previous fiscal year, is reflected in share prices in the half year after management's forecasts are announced. These results are consistent with those in a previous section, namely that analysts' estimates tend to be revised primarily one to two quarters after management's forecasts are announced.

Consequently, it appears clear that the continuity of the achievement ratios of management's forecasts is not reflected in share prices immediately after management's forecasts are announced, resulting in mispricings, which tend to correct in the half year after management's forecasts are announced. The results support the hypothesis and indicate that the bias in management's forecasts is not properly recognized by the market.

Exhibit 7 Performance results by achievement ratios for previous fiscal year

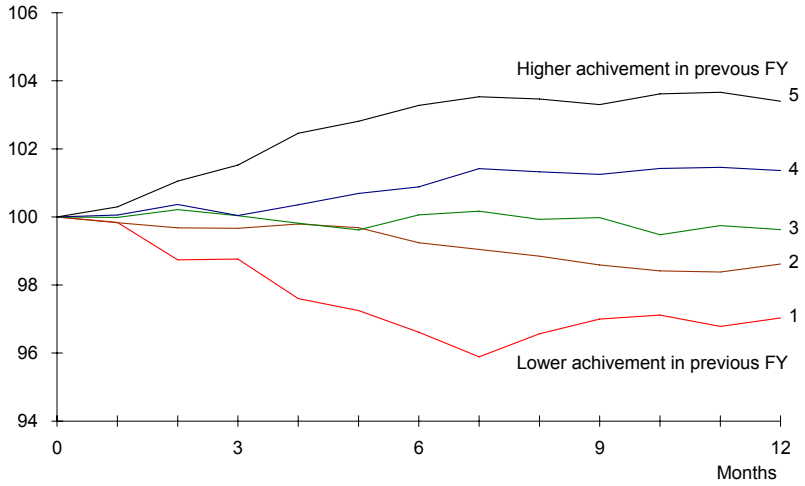
Months		(Lower) 1	2	3	4	(Higher) 5	5 - 1
		Sales achievement					
0-3	Cum. return	-1.23	-0.33	0.04	0.04	1.51	2.74
	Monthly avg.	-0.41	-0.11	0.01	0.01	0.50	0.92
	t value	(-1.69)	(-0.93)	(0.09)	(0.10)	(2.86) **	(2.36) *
0-6	Cum. return	-3.37	-0.76	0.06	0.89	3.27	6.64
	Monthly avg.	-0.57	-0.13	0.01	0.15	0.54	1.11
	t value	(-3.14) **	(-1.48)	(0.12)	(1.33)	(4.62) ***	(4.19) ***
0-12	Cum. return	-2.93	-1.38	-0.39	1.38	3.39	6.32
	Monthly avg.	-0.25	-0.12	-0.03	0.11	0.28	0.53
	t value	(-1.76)	(-1.94)	(-0.51)	(1.35)	(3.23) **	(2.59) *
3-6	Cum. return	-2.18	-0.42	0.03	0.84	1.73	3.91
	Monthly avg.	-0.73	-0.14	0.01	0.28	0.57	1.31
	t value	(-2.70) *	(-1.14)	(0.08)	(1.68)	(3.67) ***	(3.58) **
6-12	Cum. return	0.45	-0.63	-0.44	0.48	0.14	-0.31
	Monthly avg.	0.07	-0.11	-0.07	0.08	0.02	-0.05
	t value	(0.35)	(-1.25)	(-0.85)	(0.63)	(0.17)	(-0.18)
	Av. samples	206	199	193	195	201	

Months		_ower) 1	2	3	4	(Highe 5	5 - 1
		Recurrent profit achievement					
0-3	Cum. return	-1.50	-0.79	-0.32	1.17	1.48	2.98
	Monthly avg.	-0.51	-0.26	-0.11	0.38	0.49	1.00
	t value	(-1.50)	(-2.70) *	(-0.79)	(2.10) *	(3.58) **	(2.33) *
0-6	Cum. return	-4.24	-1.22	-0.11	2.80	2.92	7.17
	Monthly avg.	-0.73	-0.21	-0.02	0.46	0.48	1.21
	t value	(-2.93) **	(-2.40) *	(-0.20)	(3.05) **	(4.51) ***	(3.93) ***
0-12	Cum. return	-3.68	-0.86	-0.20	2.37	2.52	6.20
	Monthly avg.	-0.31	-0.07	-0.01	0.20	0.21	0.51
	t value	(-1.69)	(-1.08)	(-0.19)	(1.84)	(2.64) **	(2.28) *
3-6	Cum. return	-2.84	-0.45	0.21	1.60	1.42	4.26
	Monthly avg.	-0.95	-0.15	0.07	0.53	0.47	1.42
	t value	(-2.60) *	(-1.06)	(0.51)	(2.20) *	(2.84) **	(3.19) **
6-12	Cum. return	0.64	0.38	-0.08	-0.40	-0.39	-1.03
	Monthly avg.	0.11	0.06	-0.01	-0.07	-0.07	-0.18
	t value	(0.44)	(0.65)	(-0.08)	(-0.45)	(-0.65)	(-0.59)
	Av. samples	206	199	193	195	201	

Months		(Lower) 1	2	3	4	(Higher) 5	5 - 1
		Net profit achievement					
0-3	Cum. return	-1.18	-0.51	-0.37	0.47	1.61	2.79
	Monthly avg.	-0.40	-0.17	-0.12	0.16	0.53	0.93
	t value	(-0.97)	(-1.41)	(-0.73)	(0.79)	(3.67) ***	(1.82)
0-6	Cum. return	-3.04	-0.57	-0.50	1.57	2.62	5.66
	Monthly avg.	-0.52	-0.09	-0.08	0.26	0.43	0.96
	t value	(-1.77)	(-0.94)	(-0.74)	(1.75)	(3.95) ***	(2.67) **
0-12	Cum. return	-2.58	-0.73	-0.83	2.12	2.16	4.74
	Monthly avg.	-0.21	-0.06	-0.07	0.18	0.18	0.39
	t value	(-1.01)	(-0.82)	(-0.82)	(1.71)	(2.17) *	(1.51)
3-6	Cum. return	-1.96	-0.06	-0.14	1.07	1.00	2.96
	Monthly avg.	-0.65	-0.02	-0.05	0.36	0.33	0.98
	t value	(-1.51)	(-0.12)	(-0.29)	(1.63)	(2.03)	(1.92)
6-12	Cum. return	0.67	-0.16	-0.32	0.58	-0.43	-1.10
	Monthly avg.	0.10	-0.03	-0.05	0.10	-0.07	-0.18
	t value	(0.36)	(-0.25)	(-0.43)	(0.66)	(-0.64)	(-0.50)
	Av. samples	206	199	193	195	201	

Note: (1) The t-statistics are for the null hypothesis that the excess return is 0. (2) (***) indicates statistical significance (with a two-tailed test) at the 0.1% level, (**) at the 1% level, and (*) at the 5% level.
Source: Nomura

Exhibit 8　Cumulative performance results by sales achievement ratios



Note: Y-axis shows returns relative to the benchmark; x-axis shows number of months after the announcement of management's forecasts.
Source: Nomura

5. Achievement ratios of Management's Forecasts and the Surprise Effect

5. 1. Relationship with the surprise effect

The analysis up through the previous section suggests that the continuity of the bias in management's forecast is not properly recognized by the market and that achievement ratios for the previous fiscal year have predictive power for returns. The earnings surprise effect[6] is a widely known phenomenon that is similar. This effect refers to the tendency for stocks with positive (negative) earnings surprises (based on analysts' consensus estimates) to continue to rise (decline) after the earnings results (see, for example, Bernard and Thomas (1989)). Ng et. al. (2007) shows that post-management forecast drift, or the difference between management's new forecasts and existing analysts' consensus estimates, has predictive power for returns in the US market. This indicator is similar to the achievement ratios of management's forecasts in that they are based on differences between forecasts and actual results, or management's forecasts and analysts' consensus estimates. These indicators also have similar correlations with subsequent returns. Earnings surprise is definitionally the same as the achievement ratio of management's forecasts, except in that earnings surprise is based on analysts' consensus estimates immediately prior to earnings announcements rather than management's forecasts at the start of the fiscal year. Both indicators are based on differences between forecasts and actual results. Hence, the returns observed in the previous section may reflect the earnings surprise effect. In this section, we analyze this possibility.

Earnings surprise for company i in fiscal period t, $SPR_{i,t}$, is defined below, based on the definition for the achievement ratio, and the two indicators are then compared.

$$SPR_{i,t}^{sales} = \frac{Act_{i,t}^{sales} - AnalystEst_{i,t,11}^{sales}}{AnalystEst_{i,t,11}^{sales}}$$

[6] *This phenomenon is also known as post-earnings announcement drift (PEAD).*

$$SPR_{i,t}^{income} = \frac{Act_{i,t}^{income} - AnalystEst_{i,t,11}^{income}}{\left|Equity_{i,t-1}\right|}$$

$$SPR_{i,t}^{netincm} = \frac{Act_{i,t}^{netincm} - AnalystEst_{i,t,11}^{netincm}}{\left|Equity_{i,t-1}\right|}$$

$AnalystEst_{i,t,11}$ refers to analysts' consensus estimate at the beginning of the month when earnings results are announced. As for the earlier analysis, I/B/E/S consensus estimates and consolidated figures are used when available; otherwise Toyo Keizai estimates and parent figures are used.

The cross-sectional rank correlation coefficients between the achievement ratios of management's forecasts, earnings surprises, and common indicators (e.g., CAPM ß, B/P, and log market cap) are shown in **Exhibit 9**. The rank correlation coefficient between the achievement ratio and earnings surprise, whether based on sales, recurring income, or net income, is 0.5, indicating no lack of correlation but not a strong one either, considering both indicators are based on differences between forecasts and actual results. The correlation between the achievement ratio, on the one hand, and CAPM ß, B/P, and log market cap, on the other, is low, indicating that the former and latter are very much independent of each other.

Exhibit 9 Rank correlation between achievement ratio and other indicators

		ACV			SPR			CAPM β	B/P	LOG MKV
		Sales	Rec. Profit	Net Profit	Sales	Rec. Profit	Net Profit			
ACV	Sales	1.00								
	Rec. Profit	0.51	1.00							
	Net Profit	0.39	0.68	1.00						
SPR	Sales	0.54	0.24	0.16	1.00					
	Rec. Profit	0.24	0.50	0.34	0.39	1.00				
	Net Profit	0.18	0.34	0.52	0.28	0.58	1.00			
CAPM β		0.03	-0.02	-0.02	0.08	0.02	0.01	1.00		
B/P		0.09	0.06	0.07	0.16	0.11	0.11	-0.03	1.00	
LOGMKV		0.13	0.18	0.19	0.02	0.09	0.09	-0.15	-0.32	1.00

Note: Average rank correlation coefficients over the entire period as of end-May each year.
Source: Nomura

5. 2. Surprise-adjusted performance

To test whether the achievement ratios of management's forecasts have more information than earnings surprises do for predicting returns, returns were calculated using a two-step sort based on earnings surprise and achievement ratio, in the following manner.

The companies in the universe were divided at end-May each year into three equal groups based on the extent of the earnings surprises for the previous fiscal year. These three groups were then further divided into three equal subgroups based on achievement ratios, for a total of nine equal-sized groups. The monthly equal-weighted returns were then calculated for each group over the initial six months (through end-November), the timeframe that was found to be effective for predicting returns based on achievement ratios. The returns were similarly calculated for each year and then compared with the benchmark returns, which are also equal

weighted but for all stocks in the universe. The sample period is from June 1996 to November 2006.

The average annualized excess returns for each group are shown in **Exhibit 10**. In the two-step sort involving earnings surprise, the achievement ratio with the greatest effect is the one based on sales. The differences in returns between the subgroups with the highest and lowest achievement ratios were 9.22 percentage points for the group with the greatest earnings surprise, 5.52 percentage points for the middle group based on earnings surprise, and 6.63 percentage points for the group with the weakest earnings surprise. The results were all positive and statistically significant at the 5% level, indicating that achievement ratios had an impact even on surprise-adjusted returns, i.e., the ratios have information beyond what the earnings surprise factor has. The results for the two-step sorts based on recurring income and net income were not statistically significant, but the subgroups with the highest achievement ratios outperformed those with the lowest achievement ratios for all groups based on earnings surprise. These results indicate that mispricings based on the continuity of the achievement ratios of management's forecasts are different from mispricings based on earnings surprises.

Exhibit 10 Performance results based on two-step sorts

Sales

			Achivement level			
			Top	Middle	bottom	Top-Bottom
Surprise	Top	Average	-1.72	4.58	7.50	9.22
		t value	(-0.87)	(2.02) *	(4.05) ***	(3.88) ***
	Middle	Average	-3.96	1.82	1.56	5.52
		t value	(-2.47) *	(1.21)	(0.89)	(2.18) *
	Bottom	Average	-7.36	-3.15	-0.73	6.63
		t value	(-2.46) *	(-1.80)	(-0.44)	(2.42) *
	Top-Bottom	Average	5.65	7.72	8.23	
		t value	(1.43)	(2.21) *	(2.74) **	

Recurrent profit

			Achivement level			
			Top	Middle	bottom	Top-Bottom
Surprise	Top	Average	2.91	7.26	7.71	4.79
		t value	(1.40)	(3.90) ***	(4.81) ***	(1.94)
	Middle	Average	-3.92	-0.10	3.53	7.46
		t value	(-2.61) *	(-0.05)	(1.84)	(3.07) **
	Bottom	Average	-11.09	-5.06	-3.21	7.88
		t value	(-2.80) **	(-2.94) **	(-1.88)	(1.87)
	Top-Bottom	Average	14.00	12.32	10.91	
		t value	(3.60) ***	(3.93) ***	(4.04) ***	

Net profit

			Achivement level			
			Top	Middle	bottom	Top-Bottom
Surprise	Top	Average	1.81	4.15	7.99	6.18
		t value	(0.94)	(2.29) *	(4.54) ***	(2.18) *
	Middle	Average	-4.80	-1.88	3.79	8.59
		t value	(-3.11) **	(-0.98)	(1.92)	(3.48) ***
	Bottom	Average	-6.57	-3.23	-2.93	3.64
		t value	(-1.60)	(-1.68)	(-2.02) *	(0.81)
	Top-Bottom	Average	8.38	7.38	10.92	
		t value	(2.15) *	(2.31) *	(4.62) ***	

Note: (1) The t-statistics are for the null hypothesis that the average annualized excess return of each group is 0. (2) (***) indicates statistical significance (with a two-tailed test) at the 0.1% level, (**) at the 1% level, and (*) at the 5% level.
Source: Nomura

5. 3. Fama-MacBeth regression

Finally, the results of a Fama-MacBeth regression test[7] of monthly returns in the six months after achievement ratios for the previous fiscal year become available are shown in **Exhibit 11**. The independent variables are the achievement ratio for the previous fiscal year (ACV), earnings surprise (SPR), CAPM ß (beta), B/P, log market capitalization (LOGMKV), and a sector dummy variable (based on Nomura's 19-sector classification). To exclude the impact of

[7] *See Fama and MacBeth (1973).*

outliers, the highest and lowest 3% of the stocks in terms of achievement ratio for the previous fiscal year, earnings surprise, and B/P are excluded from the universe, and all variables other than the sector dummy variable are normalized to a mean of 0 and standard deviation of 1. Before the regression, values in excess of ±3 are brought to ±3.

Exhibit 11 indicates that the previous fiscal year's achievement ratio based on sales has the greatest predictive power for returns, more than the sales-based surprise factor does. This factor impact is statistically significant even adjusting for the impact of CAPM ß, B/P, or company size. Thus, it could be concluded that the sales-based achievement ratio has a different predictive power for returns than CAPM ß, value and size factors, and earnings surprise do. A similar trend is observable for the achievement ratio based on recurring income, although it has somewhat weaker explanatory power. The achievement ratio based on net income does not have statistically significant explanatory power for returns adjusted for the surprise effect, but its regression coefficient is positive even if earnings surprise is added as an independent variable. These results support the hypothesis that the continuity of achievement ratios has a different predictive power for returns than the earnings surprise factor does.

Exhibit 11 Results of Fama-MacBeth regression analysis

Sales							Recurrent profit						
Const.	ACV	SPR	Beta	B/P	LOGMKV	R2	Const.	ACV	SPR	Beta	B/P	LOGMKV	R2
-0.81 (-1.16)	0.32 (4.44) ***					0.280	-0.82 (-1.19)	0.35 (3.55) ***					0.283
-0.81 (-1.16)		0.19 (2.96) **				0.279	-0.82 (-1.19)		0.37 (4.61) ***				0.282
-0.81 (-1.16)			-0.21 (-0.88)			0.296	-0.82 (-1.19)			-0.18 (-0.81)			0.295
-0.81 (-1.16)	0.29 (3.60) ***	0.07 (1.04)				0.282	-0.82 (-1.19)	0.22 (2.30) *	0.28 (3.73) ***				0.286
-0.81 (-1.16)	0.30 (4.72) ***		-0.20 (-0.88)			0.298	-0.82 (-1.19)	0.33 (4.05) ***		-0.16 (-0.74)			0.299
-0.81 (-1.16)		0.18 (3.14) **	-0.21 (-0.90)			0.297	-0.82 (-1.19)		0.33 (4.92) ***	-0.16 (-0.73)			0.298
-0.81 (-1.16)	0.26 (3.72) ***	0.07 (1.14)	-0.20 (-0.89)			0.300	-0.82 (-1.19)	0.22 (2.64) *	0.25 (3.68) ***	-0.15 (-0.72)			0.301
-0.81 (-1.16)	0.25 (4.77) ***		-0.11 (-0.54)	0.18 (2.13) *	0.37 (2.04) *	0.317	-0.82 (-1.19)	0.25 (3.67) ***		-0.07 (-0.36)	0.23 (2.58) *	0.39 (2.23) *	0.317
-0.81 (-1.16)		0.14 (2.77) **	-0.12 (-0.56)	0.17 (1.94)	0.39 (2.16) *	0.316	-0.82 (-1.19)		0.27 (4.90) ***	-0.07 (-0.37)	0.23 (2.52) *	0.41 (2.33) *	0.317
-0.81 (-1.16)	0.23 (3.91) ***	0.04 (0.78)	-0.11 (-0.54)	0.18 (2.10) *	0.37 (2.08) *	0.318	-0.82 (-1.19)	0.17 (2.33) *	0.21 (3.59) ***	-0.07 (-0.36)	0.22 (2.58) *	0.39 (2.24) *	0.319

Net profit						
Const.	ACV	SPR	Beta	B/P	LOGMKV	R2
-0.82 (-1.19)	0.26 (2.45) *					0.284
-0.82 (-1.19)		0.25 (3.55) ***				0.281
-0.82 (-1.19)			-0.20 (-0.89)			0.295
-0.82 (-1.19)	0.15 (1.40)	0.20 (3.08) **				0.285
-0.82 (-1.19)	0.24 (2.77) **		-0.19 (-0.89)			0.299
-0.82 (-1.19)		0.21 (3.62) ***	-0.19 (-0.86)			0.297
-0.82 (-1.19)	0.15 (1.59)	0.18 (2.87) **	-0.19 (-0.88)			0.301
-0.82 (-1.19)	0.18 (2.24) *		-0.10 (-0.51)	0.21 (2.24) *	0.40 (2.32) *	0.318
-0.82 (-1.19)		0.17 (3.15) **	-0.10 (-0.50)	0.21 (2.21) *	0.41 (2.41) *	0.316
-0.82 (-1.19)	0.11 (1.22)	0.14 (2.38) *	-0.10 (-0.51)	0.21 (2.23) *	0.40 (2.35) *	0.319

Notes: (1) The t-statistics are for the null hypothesis that the regression coefficient is 0. (2) (***) indicates statistical significance (with a two-tailed test) at the 0.1% level, (**) at the 1% level, and (*) at the 5% level. (3) The sector dummy variable is used in all models, but its coefficient has been omitted. (4) The constant term shows the average coefficient for the sector dummy variable, weighted by the number of stocks, but does not depend on the model because the independent variables are normalized.

Source: Nomura

6. Conclusion

This paper analyzed the possible bias in management's forecasts; its continuity, as measured by the achievement ratio (showing the difference between management's forecasts and actual results); and whether the market properly recognizes the continuity.

The results showed that those companies with high (low) achievement ratios in the past tend subsequently to have high (low) achievement ratios. These results are consistent with the hypothesis that management's forecasts have a bias stemming from the particular characteristics of the executives and/or the companies and that this bias tends to have continuity because the particular characteristics do not change much in the short term, and suggest that the past achievement ratios of management's forecasts can be used to forecast the bias in management's forecasts to some extent.

This paper also analyzed whether the market properly recognizes the continuity of the bias in management's forecasts. The results showed that consensus earnings estimates tend to be close to management's forecasts immediately after the latter are announced, regardless of past achievement ratios, and then tend to be revised over the subsequent one to two quarters in the expected direction based on the continuity of the achievement ratios. The results also showed that achievement ratios for the previous fiscal year have statistically significant explanatory power for subsequent six-month returns. These results support the hypothesis that the market does not properly recognize the continuity of the bias in management's forecasts immediately after the forecasts are announced, that the extent to which management's forecasts for the following fiscal year are achieved gradually becomes apparent based on company trends, and that consequently the continuity of the achievement ratios may be mispriced immediately after management's forecasts are announced. Finally, the results confirmed that the continuity of achievement ratios may have a different explanatory power for returns than that of earnings surprise, a similar indicator.

While management's forecasts may have a bias, they play a very important role in terms of communicating management's outlook directly to investors. The characteristics of management's forecasts could be a subject of further study to accurately extract information from management's forecasts and to be able to use them more effectively.

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