An Investigation of Asymmetric Earnings Forecasts of Japanese Financial Analysts

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ABSTRACT: A number of U.S. studies have documented an optimistic bias in analysts' forecasts of earnings. This study investigates whether the optimistic bias and asymmetric behavior of forecast errors found in most U.S. studies exists in Japan. We find that for firms reporting profits, Japanese analysts' forecasts have much greater accuracy and exhibit a small pessimistic bias in comparison to firms reporting losses, where analysts' forecasts exhibit extremely poor accuracy and an extremely significant optimistic bias. The lack of ability to forecast losses is due to their transitory nature and not due to earnings management. Forecast accuracy and bias are not related to firm size, but are related to the magnitude of reported losses and profits.

INTRODUCTION

Forecasts of corporate profits influence the price of corporate stocks. When a firm announces that earnings will not be as large as the forecasted value, the firm's stock price immediately falls. In a similar way, when a firm earns higher profits than that forecasted, the company's stock price increases. Numerous studies in accounting and finance have found results suggesting that earnings forecasts made by U.S. analysts display an optimistic bias (i.e., forecasted earnings exceed actual earnings).[1] A number of explanations have been offered regarding this phenomenon. Some studies focus on the behavior of analysts making the forecasts while others focus on the behavior of the managers of firms whose earnings are being forecasted.

With respect to the analysts, one argument is that those making

[1] See, Brown (1998) for a review of the literature.

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forecasts may have incentives to overestimate earnings (Philbrick and Ricks, 1991; Dugar and Nathan, 1995), while another explanation is simply that the analysts are not able to make rational forecasts of earnings. With respect to the latter, Dowen (1996) and Hwang *et al.* (1996) find that analysts have difficulty predicting losses and large profits because of the highly transitory nature of these occurrences.[2]

A second line of reasoning focuses on the behavior of managers and explores whether the optimistic bias is the result of certain kinds of earnings management or, possibly, the result of firms having the ability to manage analysts' forecasts. With regard to earnings management, Brown (1998) argues that an optimistic bias (forecast > actual earnings) often exists when managers expect to report losses, because they may take efforts to exacerbate the loss (leading to a large optimistic forecast error) hoping to have a more prosperous following year.[3] But when managers expect profits, a slight pessimistic bias (forecast < actual earnings) often exists because they attempt to exceed the analyst's forecasts by a small amount. An additional source of manipulation of the forecast error is a firm's management, through its communications with analysts, influencing the analysts' forecasts (forecast management). In a recent speech, Arthur Levitt, former chairman of the Securities and Exchange Commission (SEC) articulates these issues:

> "This is the pattern earnings management creates: companies

[2] For a discussion of the distinction between permanent and temporary earnings forecasts, see Ali, Klein and Rosenfeld (1992).

[3] A number of studies have shown that if actual earnings come in below those forecasted, even by an amount as small as a few cents, the stock price of the firm falls dramatically. This means that firms have an incentive to take larger losses. Whether the forecast error is small or large, the stock price is going to fall dramatically.

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try to meet or beat Wall Street earnings projections in order to grow market capitalization and increase the value of stock options. Their ability to do so depends on achieving the earnings expectations of analysts. And analysts seek constant guidance from companies to frame those expectations." (Levitt, 1998).

A major objective of this study is to investigate whether the optimistic bias and asymmetric behavior of forecast errors found in most U.S. studies exists in Japan. There are a number of reasons that we focus on Japanese firms. First, while Japan has the second largest stock market in the world with over 343 trillion yen in market value of stocks on the Tokyo Stock Exchange-First Section as of February 2001, there has been little investigation of biases in analysts' forecasts of Japanese firms. Second, large amounts of U.S. and international funds have flowed into the Japanese stock market and, as such, international investor interest in Japanese stocks is high. For example, as of December 31, 1999, the value of U.S. mutual funds invested solely in Japanese stocks was $8.1 billion. This amount does not include balances of funds that only invest in Pacific Rim, global and/or international stocks. The balance of U.S. mutual funds that specialize in Pacific Rim stocks as of December 31, 1999, was $12.4 billion. Third, if the forecast bias exists in Japan, similar to that found in the U.S. studies, we attempt to determine whether the cause is due to analysts' irrationality or to either earnings management or forecast management. If earnings or forecast management is the reason, knowing the extent of this practice in Japan should be of concern to U.S. and international investors and the Japanese Ministry of Finance (MOF) which monitors financial and accounting practices of Japanese firms. The U.S. Securities and Exchange Commission (SEC) has recently begun considering whether to allow foreign firms to list on U.S. exchanges using International Accounting Standards (IAS). The SEC is also interested in knowing the extent of earnings management by foreign firms. Indeed, the Chief Accountant of the SEC has asked academic researchers to provide more evidence on earnings management in other countries using IAS (Turner and Godwin, 1999). While our discussion focuses on Japanese accounting standards rather than IAS, our evidence is suggestive of the strictness with which accounting standards are applied and interpreted in Japan and provides evidence useful to the SEC on this issue.[4]

Our empirical investigation focuses on the 225 Japanese firms that make up the Nikkei composite stock

[4] Pownall and Schipper (1999) also examine country-specific practices to make inferences and recommendations to the SEC on the potential value-relevance of IAS standards if adopted by different countries.

index. Our results suggest that during periods in which firms experience losses, forecasts tend to be overly optimistic. During periods where firms experience profits, forecasts appear to be reasonably accurate, but exhibit a small pessimistic bias. Our results suggest that analysts who forecast earnings in Japan have a difficult time predicting losses and large profits due to their transitory nature. We also show that firm size is not directly related to forecast bias, but, rather, that forecast bias is related to the magnitude of profit or loss a firm reports. With the exception of a few cases, there is generally a significant improvement in forecast accuracy of annual earnings from the first to the fourth quarter. However, we also find that the extent of analysts' forecast bias for firms that report losses decreases only slightly from their first to their fourth quarter forecasts of annual earnings. Finally, we investigate whether the large negative forecast errors for firms experiencing losses and small positive errors for firms reporting profits result from discretionary accruals being used by managers.

Brown and Higgins (1999) examine the extent to which Japanese managers (along with managers in 12 other countries) attempt to manipulate earnings to achieve the forecasted value. While Brown and Higgins (1999) do not provide formal tests of the relationship between earnings manipulation and asymmetric patterns in forecast errors, we, in fact, test this relationship and find no evidence to support either earnings or forecast management. Thus, while managers in Japan may manage earnings, they do not do so in the same manner as it is often accomplished in the United States.

The organization of the remainder of this paper is as follows: section two provides a review of the literature, section three describes the data used in this study, section four presents the methodology and empirical results relating to the accuracy and degree of bias in analysts' forecasts using descriptive statistics. In section five we investigate whether the optimistic bias of analysts' forecasts are the result of earnings and/or forecast management. Finally, section six presents the summary and conclusion.

REVIEW OF LITERATURE

Numerous studies have examined whether or not financial analysts' earnings forecasts are biased. Kang *et al.* (1994) and Francis and Philbrick (1993), among others, have found that analysts' forecasts tend to be optimistic in that analysts' earnings forecasts are, on average, higher than actual earnings. Other research has concluded that U.S. analysts do not make rational forecasts because they either under react (e.g., Abarbanell and Bernard, 1992) or over react to new information (DeBondt and Thaler, 1990).

Dowen (1996) investigates the difference in forecast errors between firms reporting losses and those reporting profits. He finds that analysts display a greater optimism for firms reporting losses than for firms reporting profits. He finds that

the median forecast error is more optimistic for firms reporting losses, as is the proportion of overly optimistic forecasts. Hwang *et al.* (1996) examine Institutional Brokers Estimate System (I/B/E/S) analysts' forecast accuracy and find that I/B/E/S analysts' earnings forecasts for firms reporting losses are, on average, much too high and much less accurate than those of firms that report profits. They report that the average forecast error of firms reporting losses is about 10 times that of firms reporting profits and, the larger the reported loss, the larger and more negative the forecast error. They also find that the overall negative forecast error for their study is cut in half when loss firms are excluded from their sample. It would appear that the optimistic bias reported in earlier studies is due to the inclusion of firms reporting losses. Hwang *et al.* (1996) also find that firms reporting losses are, on average, much smaller than firms reporting profits, suggesting that the higher forecast error found for loss firms might be the result of firm size or risk characteristics. They investigate the size issue by grouping loss and profit firms by their relative market value and find that large loss firms have significantly higher forecast errors than small profit firms, thus, concluding that analysts' forecast accuracy depends more on whether the firm reports a profit or loss than on its size. They argue that firms that report losses have larger temporary earnings components than those that report profits and, thus, it is difficult for analysts to predict in loss situations. This is consistent with the idea that losses are more transitory in nature than profits and, hence, more difficult to predict.[5]

Rather than focus on analyst's rationality in attempting to understand the nature of forecast errors, a few recent studies have explored another explanation which is the firm's management of the forecast error. In this regard, two studies have investigated aspects of the earnings component rather than the earnings forecasts themselves as a source of the forecast error. Brown (1998) argues that managers have different incentives to manage earnings depending on whether a firm reports a profit or a loss. For firms reporting profits, it is argued that managers attempt to achieve or slightly exceed analysts' earnings forecasts, resulting in small positive forecast errors. However, in years in which losses are reported, it is argued that managers are not concerned too much with meeting analysts' forecasts but, instead, at times, take actions that will increase *future* earnings (and their future compensation) by taking a "big bath" in the current year (by forcing a larger loss than would otherwise occur). If analysts are unaware that a firm intends to take a "big bath," their forecast will likely overstate actual

[5] One other interpretation that they give to their results is that, since loss firms are primarily followed by analysts, they will, on average, overpredict earnings because they are paid by the amount of the commission they generate (Philbrick and Ricks, 1991).

earnings by a large amount.[6] If enough firms exhibit such extreme negative forecast errors, the mean forecast errors for a large sample of firms will be skewed to such an extent that the average forecast error for the entire sample may be negative, erroneously suggesting that, on average, analysts are optimistic.

Consistent with this, Brown (1998) finds that an optimistic bias exists when firms report losses, but a pessimistic bias exists when firms report profits. Further, he finds that analysts following small firms display greater optimism because small firms are more likely to report losses. However, while Brown argues that these results suggest that managerial behavior affects forecast errors, his results cannot definitively distinguish between whether it is managerial behavior that causes these findings or whether it is analysts' behavior (i.e., analysts may be less adept at forecasting losses than they are at forecasting profits).

Whether analysts have greater difficulty forecasting in years in which losses occur relative to years when profits occur, cannot be determined by an analysis of the current year's forecast error. This analysis can yield misleading results because it cannot determine whether a large forecast error is the result of analyst behavior or the firm managing earnings. One must investigate actual earnings and forecasts and attempt to find a set of variables, which would act as a "smoking gun" to determine whether managers actually manage earnings in bad years or whether analysts are just poor forecasters of losses.

In line with the above point, Abarbanell and Lehavy (2000a) build upon Brown's research and show that managerial behavior is at least partly responsible for the patterns observed. Specifically, they show that when managers elect to take large income decreasing discretionary accruals (earnings baths), these events are associated with extreme negative forecast errors.[7] They also report that the higher incidence of small pessimistic errors is associated with reporting discretion (earnings management) to achieve or slightly exceed analysts' forecasts by a few cents per share.[8]

In addition to managing the earnings component of the forecast error through accounting manipulations, managers can also influence forecasts through their communications with analysts throughout the reporting period, which can also result in systematic patterns in forecast errors. Richardson *et al.* (1999) investigate forecast management and find that U.S. analysts overestimate earnings in the first quarter of the year, but revise their

[6] Note that extreme negative errors can arise even if the firm does not take a big bath.

[7] Abarbanell and Lehavy (2000a, 2000b) argue that taking extreme discretionary accruals is sometimes the optimal response when firms cannot meet the analysts' forecasts.

[8] Note, that Abarbanell and Lehavy's research does not imply that other incentive explanations are incorrect (e.g. analysts may not be rational), but it does suggest that existing theories need to be refined.

forecasts downward each succeeding quarter so that, by year-end, they have underestimated reported earnings. Their study supports the following anecdotal claim:

> "CFO's are more likely to talk forecasts down rather than up, so as to increase the likelihood of a positive earnings surprise and avoid a negative earnings surprise." (I/B/E/S, 1996).

Burgstahler and Eames (1999) also test for managing of analysts' forecasts by comparing the forecast revision that occurs between the first and fourth quarters of the year, using this as a proxy for forecast management. The forecast revision, as they acknowledge, could be the result of managers influencing the analysts' forecasts, or the result of new information that became available to the analysts during the course of the year from sources other than management. However, their results do show that, in the fourth quarter, a downward forecast revision of annual earnings occurs more frequently when such a revision is sufficient to avoid a negative surprise (actual earnings less than forecasted earnings), rather than to make a negative surprise less negative or a positive surprise more positive. This pattern of forecast revision is consistent with forecast management.

Studies of the Rationality of Analysts' Forecasts in Japan

Studies regarding Japanese analysts' earnings forecasts find that they display an optimistic bias. Mande and Kwak (1996) show that Japanese analysts make more optimistic forecasts relative to U.S. analysts following the same Japanese firms. The authors also examine analysts' reports and find that Japanese analysts are more optimistic regarding a firm's future economic prospects[9] and, thus, conclude that Japanese analysts, who possibly have stronger ties with Japanese corporate managers, have more incentive to publish optimistic forecasts.[10] Mande (1996) also finds that Japanese analysts' average earnings forecast errors are negative, and concludes that Japanese analysts "add a measure of optimism to their earnings forecasts to remain in favor with management (p.96)." His study provides indirect evidence in support of forecast management in Japan. Specifically, his findings are that Japanese analysts' first quarter forecasts of annual earnings *exceed*

[9] For example, in their sample for Fuji, the Japanese analysts predicted that profits would rise and that there was favorable demand for the firm's products. By contrast, the U.S. analysts predicted that there would be negative profit growth because competition was depressing margins.

[10] In a telephone conversation with one of the authors of this study, an analyst of Toyo Kezai strongly disagreed that Japanese analysts release optimistic forecasts to remain in favor with the management. He pointed out that an analyst's income comes from his clients and not the firm. He did, however, provide no explanation why his firm's forecasts were, on average, optimistic.

the reported earnings by an average of 11 percent, the second quarter by nine percent, and the third by six percent. However, their fourth quarter estimate is on average two percent *below* actual earnings. Mande, however, only examines analysts' forecasts of Japanese firms that are listed on U.S. exchanges.

Studies of Earnings Management in Japan

The few papers that have investigated earnings management to date in Japan have primarily examined one kind of earnings management: income smoothing (e.g., Hall *et al.,* 1994; Ball *et al.*, 1998). Studies suggest that Japanese managers may have bonus, debt, and other contractual incentives to smooth earnings (e.g., Herrman and Inoue, 1996; Mande *et al.,* 2000). Dechow and Sloan (2000) point out that while academics have tended to focus on contractual incentives, practitioners and regulators have focused on incentives provided by capital markets to manage earnings, such as whether firms believe there is a benefit in meeting analysts' forecasts.

The present paper follows this more recent approach by focusing on capital market incentives and providing evidence of an additional type of earnings management other than income smoothing. The only paper related to this topic of investigating Japan is Brown and Higgins (1999) which compares earnings surprises in the U.S. with those in 12 other countries, including Japan. They show that U.S. managers are more adept at managing earnings surprises than are managers in 12 other countries. However, they also find that when firms have losses, the percentage of extreme negative surprises is significantly less for Japanese firms relative to U.S. firms. They suggest that Japanese managers manage losses better than U.S. managers, which is contrary to their initial expectations. In fact, this surprising result is only found for Japan. They attempt to explain this by arguing that Japanese markets are unique in that Japanese managers are required to provide forecasts of next year's earnings, and that these managers forecast accurately.

We could accept this explanation if there were also more accurate forecasts for years in which firms earned profits, however, this is not the case. In their study, Brown and Higgins (1999) use I/B/E/S consensus forecasts where the actual earnings of foreign firms are those reported, not by the firms, but by the analysts themselves. While I/B/E/S appears to have taken steps since 1995 to correct this situation, there are still the following problems: i) I/B/E/S defines income differently for various firms and over time, and ii) some analysts forecast a different income concept than the actual earnings reported by I/B/E/S. These problems make conclusions regarding the management of forecast errors questionable (Abarbanell and Lehavy, 2000b).

As a result of the self-reporting situation, Brown and Higgins (1999) used only forecasts over a three-year

period, 1995-1997. In our study, the annual earnings forecasts, reported quarterly, are over a 10 year period and are made by all analysts for one definition of earnings: 'reported earnings'. Also, Higgins (2002) finds that forecast lags of I/B/E/S analysts for Japanese firms range from a low of 49 days in 1993 to a high 220 days in 1996, where as, the forecast lag of our analysts is the same throughout the 10 year period. Because forecast horizon affects forecast accuracy, it is important to have a constant forecast lag.

DATA

Our sample is composed of firms that were included on the Nikkei 225 Index every year from 1988 through 1997.[11] For these firms, we obtained consolidated net income data and forecasts of consolidated net income from the Japan Company Handbook-First Section[12] (JCH) published by Toyo Kezai (henceforth, TK), a Japanese firm of analysts.[13] Since 1988 TK has published one firm-wide forecast of consolidated annual earnings for each firm four times a year (Winter, Spring, Summer and Autumn), similar to Value-Line in the U.S. The forecasts published by TK were collected for firms with fiscal years ending on March 31.[14] The March 31 year-end restriction is to ensure that the forecast horizon is the same for all sampled firms.[15] During the sample period, 61 firms did not report consolidated earnings for fiscal years ending March 31. Therefore, our sample consists of 164 firms for which 1,560 earnings forecasts and actual values were available. The forecasts of annual earnings used in this paper are published every quarter. We employ forecasts of annual consolidated net income, published by TK, made in the first (Autumn issues) and fourth quarter (Winter issues) of each year. Our primary emphasis is on annual earnings forecasts made in

[11] The Nikkei 225 Index, computed using stock prices of 225 leading Japanese issues, is Japan's benchmark stock average index.

[12] Stocks on the Tokyo Stock Exchange are traded on two sections. In order to be listed on the First Section, firms must meet certain standards set by the exchange. These standards relate to the minimum number of shares outstanding, trading volume and frequency, and minimum dividend payment. It is usual for new firms to be listed on the Second Section first, before they are transferred to the First Section. In 1987 there were 1100 (435) firms listed on the First (Second) Exchange with a total market value of 352 (11.4) trillion yen (Hamao, 1991).

[13] Toyo Keizai is a highly respected brokerage house in Japan. Forecasts provided by Toyo Keizai analysts are of high quality and Japanese investors place a high degree of trust and confidence in these forecasts (Mande,1996). The group forecasts published by TK are similar to those provided by Value-line in the U.S.. Such firm-wide forecasts are common in the extant literature.

[14] The most common year-end for Japanese firms is March 31. Approximately two-thirds of all firms on the First Exchange have this fiscal year-end.

[15] O'Brien (1988) shows that forecast horizon is an important determinant of forecast accuracy.

the fourth quarter, as this is where most of the earnings management takes place (Mande *et al.,* 2000). However, we also analyze the change in the annual earnings forecasts reported in the first versus the fourth quarter. Data on shares outstanding, sales, plant property and equipment, total assets and accounts receivables, special gains and losses were obtained from the 1998 Pacific Basin Capital Markets (PACAP) data bases.

METHODOLOGY AND EMPIRICAL RESULTS

Characteristics of the Fourth Quarter Forecasts for the Overall Sample

Figure 1 on the next page presents the distribution of Japanese analysts' fourth quarter annual earnings forecast errors for the overall sample. Similar to Brown (1998) and Degeorge *et al.* (1999), we analyze forecast errors on a per share basis[16] and winsorize extreme forecast errors (see Brown, 1998 and Abarbanell and Lehavy, 2000a). We define "extreme" as forecast errors exceeding ±25 yen. Extreme positive (negative) errors were 1.28 percent (2.95 percent) of the total number of observations.

Figure 1 shows that the largest concentration of forecast errors is around zero, which suggests that Japanese analysts are generally very accurate in forecasting earnings. Indeed, 68 percent of all Japanese analysts' forecast errors are ±5 yen and 22 percent are ±1 yen. Of those that are ±1 yen, there are more positive (55 percent) than negative (45 percent) forecast errors, a pattern also reported for U.S. analysts' forecast errors (Brown, 1998).

Are Japanese Analysts Optimistic in Forecasting Earnings?

For the overall sample, the mean earnings forecast error (defined as actual minus forecast) is -1.20 yen and 55 percent of all forecast errors are negative. The mean is statistically significantly different from zero (t-value=-5.96). Our greater frequency of optimistic errors is consistent with previous studies of U.S. analysts' forecasts whose results have also shown marginally more optimistic forecast errors than pessimistic[17] (Brown, 1998).

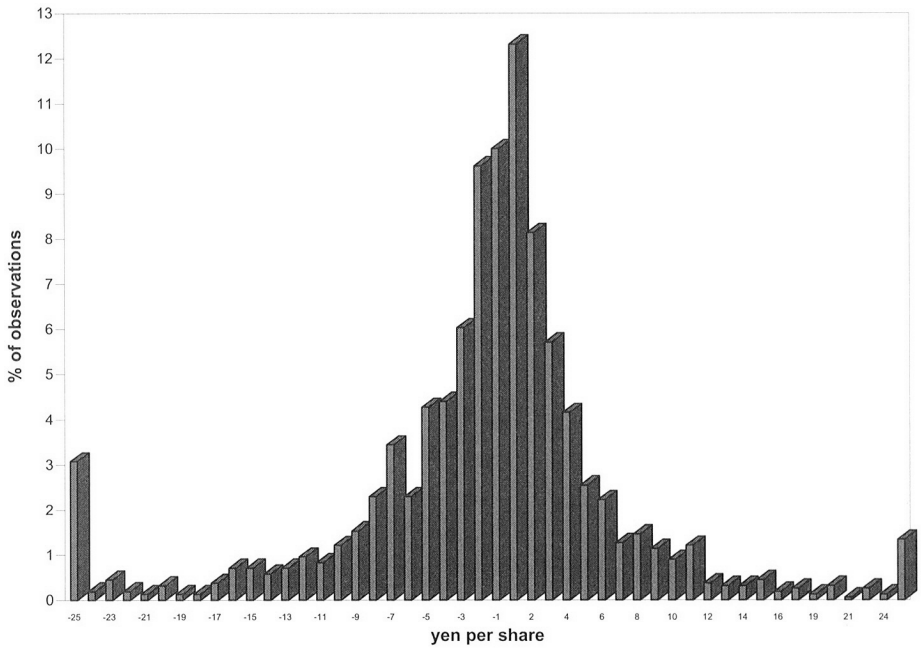
However, unlike the mean, the median forecast error is small, about -0.48 yen, which is only 40 percent of the mean forecast error.[18] This

[16] Forecast error on a per share basis was computed by subtracting forecasted from actual earnings which was then divided by common shares outstanding at the beginning of the fiscal year. There were no zero forecast errors. Besides being easier to interpret, Brown (1998) argues that the number of forecast errors classified as being "close" to or "far away" from zero depends on the deflator used.

[17] By way of comparison to U.S. analysts, Brown (1998) finds that the mean forecast error is -1.53 cents and that 52.1 percent of the forecast errors are negative.

[18] Although small, we find the median is also statistically significantly different from zero using the non-parametric sign test (z-value=-3.69).

Figure 1
Forecast Errors of All Firms in the Sample (1988-97)
n = 1560

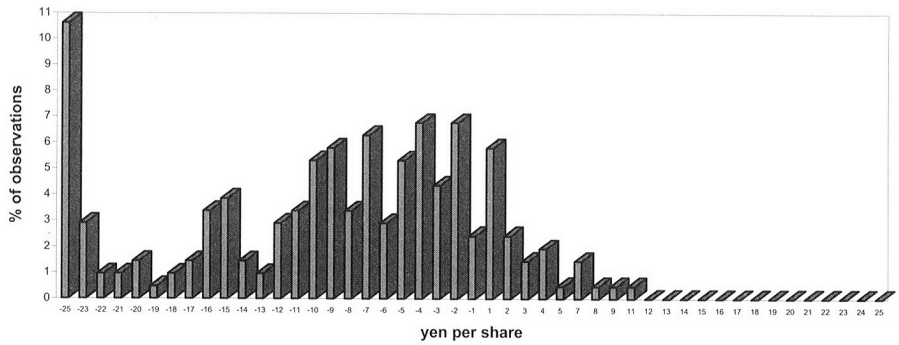


suggests that the overall mean bias may be significantly influenced by a few large negative forecast errors (Abarbanell and Lehavy, 2000a; Brown, 1998). A visual inspection of Figure 1 also supports this contention. The distribution of Japanese analysts' forecast errors has a longer and fatter optimistic than pessimistic tail. That is, there are more "large" negative than "large" positive forecast errors. For example, 20 percent of all forecasts exceeded actual earnings by five or more yen, but only 12 percent of all forecasts were under actual earnings by five or more yen. Similar to U.S. studies (e.g., Abarbanell and Lehavy, 2000a), when we truncate only five percent of each tail of the forecast error distribution, we find that the mean bias decreases considerably (26 percent), from -1.20 to -0.88, which demonstrates the significant effect of extreme negative errors on the mean bias.

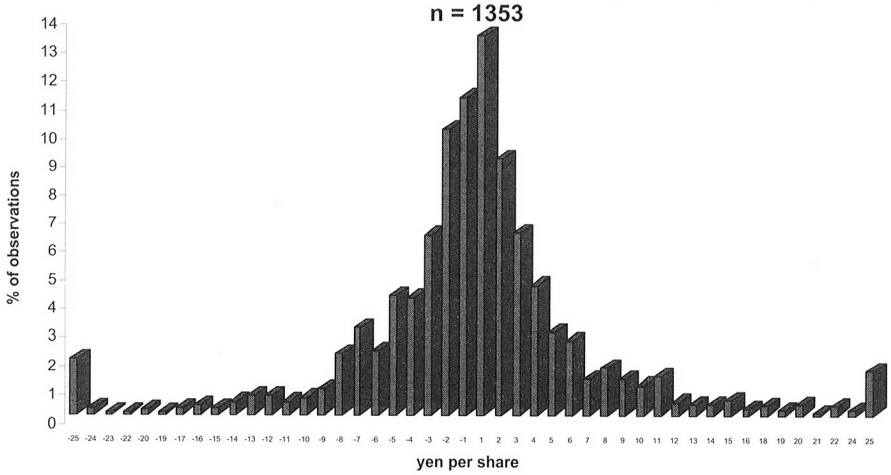
Does the Reporting of a Loss versus a Profit Affect Analysts' Forecast Errors?

Figure 2 and Table 1 on the next pages summarize the sample distribution of forecast errors. There are 207 cases where Japanese firms report losses, representing 13 percent of the sample. Figure 2, Panel A, shows that for these firms, Japanese analysts' forecasts substantially exceed reported earnings. The mean (median) forecast error for this sub-sample (reported in Table 1) is about -8.65 (-7.11) yen, which is 721 (1,481) percent larger than the mean

Figure 2
Panel A: Forecast Errors for Firms Reporting Losses (1988-97)
n = 207



Panel B: Forecast Errors for Firms Reporting Profits (1988-97)
n = 1353



(median) forecast error of the overall sample. In comparison, for the 1,353 cases where Japanese firms report profits, Figure 2, Panel B, shows that forecast errors for firms reporting profits are much smaller than for firms that report losses. For this sub-sample, the mean forecast error (reported in Table 1) was negative, about -0.06 yen (t-value=-0.32), while the median error was positive, 0.01 yen (z-value=0.02). Both mean and median forecast errors for firms reporting profits are statistically insignificant at all conventional levels of statistical testing. These results indicate that the statistically significant optimistic bias for the overall sample is caused by a

Table 1: Sample Distribution of Forecast Errors

	Mean[a]	Median[a]	% negative forecast errors	Forecast Error (|FE|) > 25 yen: % extreme positive FE	Forecast Error (|FE|) > 25 yen: % extreme negative FE	% FE between ± 1 yen	% of all FE between ±1 yen that are between 0&1 yen	% of FE where actual< forecast by 5 yen	% of FE where actual > forecast by 5 yen	% forecasting a profit when a loss occurred	%forecasting a loss when a profit occurred
Overall sample	-1.20	-0.48	55	1.28	2.95	22	55	20	12	-	-
Firms reporting losses	-8.65	-7.11	85	0.00	10.00	8	70	59	3	45	-
Firms reporting profits	-0.06	0.01	50	1.50	1.90	25	54	14	14	-	-

Notes: a. In yen per share.

relatively small number of large negative forecast errors of firms reporting losses, and that analysts' forecasts are generally on target for firms reporting profits.

To evaluate the effect of the relatively few observations that are driving inferences concerning analysts' optimism for the overall sample, we examine the frequency and magnitude of extreme negative errors for the loss sub-sample. As Table 1 shows, for this sub-sample, 85 percent of the forecast errors are negative and, further, 10 percent of these are substantially negative with analysts' forecasts exceeding actual earnings by 25 or more yen. In comparison, there are no instances where actual earnings exceeded analysts' forecasts by more than even 11 yen. In addition to displaying poor forecast accuracy, we also find that Japanese analysts have extreme difficulty in identifying that a loss will even occur. Specifically, as data in Table 1 (see Columns 11 and 12) shows, analysts forecast profits 45 percent of the time when losses were subsequently reported. In contrast, analysts' predict losses in only two percent of the cases where firms subsequently reported profits.

We next again examine the sub-sample of firms reporting profits. Table 1 shows for this sub-sample, 50 percent of the forecast errors are positive; 1.5 percent are extremely positive, (i.e., actual exceeds forecast by more than 25 yen) and 1.9 percent are extremely negative, (i.e., forecast exceeds actual by more than 25 yen). The biggest concentration of forecast errors, amounting to 25 percent, are ± 1 yen. Of these, 54 percent are positive and 46 percent are negative.

Overall, we find that there is a fundamental difference in the distribution of forecast errors for firms reporting losses versus firms reporting profits. There is much greater forecast accuracy and no forecast bias when firms report profits, but extremely poor forecast accuracy and extremely significant optimistic bias when firms report losses. Our results also indicate that, overall, the optimistic bias for the entire sample of forecast errors is driven by a few, extremely negative, forecast errors of firms that report losses.

Does Analysts' Forecast Accuracy and Bias Improve Over Time?

Unforeseeable regime changes can result in systematic forecast errors in certain periods, even when agents are fully rational. Because our sample covers a 10 year period, it is possible for us to examine whether the overall optimistic bias of the entire sample can be attributed to certain periods and whether the forecast optimism and forecast errors are significantly reduced from 1988 to 1997 regardless of whether firms reported losses or profits.

Table 2 presents yearly forecast error statistics separating firms that report losses from those that report profits. Summary statistics in Table 2 include the mean error (ME), the mean absolute error (MAE) and the root mean square error (RMSE). ME is a measure of the average magnitude of the forecast error, and can be

Table 2: Trends in Forecast Accuracy & Bias

Panel A: Firms Reporting Losses (N=207)									
		Forecast Accuracy[a]			Forecast Bias[a]				
		Absolute Forecast Error |*Actual-Forecast*|			Signed Forecast Error *Actual-Forecast*		Proportion of Analysts Forecasting a Loss	Proportion of Extremely Negative Forecast Errors	Proportion of Extremely Positive Forecast Errors
Year	N	Mean	Std.Dev.	RMSE[b]	Mean	Std.Dev.			
1988	9	7.18	5.58	8.90	-7.00	5.83	0.55	0.00	0.00
1989	3	4.25	3.58	5.15	3.07	5.08	1.00	0.00	0.00
1990	3	13.06	10.84	15.78	-13.06	10.84	0.00	0.33	0.00
1991	6	16.99	6.52	18.00	-16.99	6.52	0.33	0.17	0.00
1992	11	15.43	7.30	16.93	-15.43	7.30	0.27	0.27	0.00
1993	30	11.01	6.72	12.92	-11.01	6.72	0.40	0.00	0.00
1994	46	6.24	5.56	8.32	-5.26	6.50	0.74	0.02	0.00
1995	44	8.45	7.56	11.28	-7.58	8.45	0.59	0.07	0.00
1996	30	11.06	9.63	14.56	-10.06	10.70	0.57	0.27	0.00
1997	25	9.86	8.55	12.94	-8.62	9.85	0.48	0.12	0.00
Totals	207	9.46	7.77	12.23	-8.65	8.67	0.55	0.10	0.00
Corr. With Year[c]		0.06		0.11	-0.13		0.13	0.04	

Notes: a. In yen per share.
b. RMSE = Root Mean Square Error
c. There were no statistically significant trends.

Table 2: Trends in Forecast Accuracy & Bias (Continued)

Panel B: Firms Reporting Profits (N=1,353)									
		Forecast Accuracy[a]			Forecast Bias[a]				
		Absolute Forecast Error |Actual-Forecast|			Signed Forecast Error *Actual-Forecast*		Proportion of Analysts Forecasting a Loss	Proportion of Extremely Negative Forecast Errors	Proportion of Extremely Positive Forecast Errors
Year	N	Mean	Std.Dev.	RMSE[b]	Mean	Std.Dev.			
1988	114	3.99	4.82	6.24	2.14	5.89	0.02	0.01	0.01
1989	145	4.30	5.71	7.13	1.92	6.89	0.01	0.01	0.02
1990	152	4.15	5.00	6.49	0.36	6.49	0.01	0.01	0.02
1991	153	4.20	4.98	6.50	-0.83	6.47	0.01	0.01	0.01
1992	150	5.64	6.25	8.40	-3.38	7.72	0.01	0.04	0.01
1993	132	4.21	5.28	6.74	-1.30	6.64	0.01	0.02	0.01
1994	117	4.47	5.95	7.42	-0.07	7.45	0.04	0.03	0.02
1995	119	4.51	5.34	6.97	0.56	6.97	0.03	0.01	0.02
1996	133	4.66	6.03	7.61	0.27	7.63	0.02	0.05	0.01
1997	138	4.80	6.46	8.03	0.35	8.06	0.01	0.03	0.03
Totals	1353	4.50	5.61	7.20	-0.06	7.20	0.02	0.02	0.01
Corr. With Year[c]		0.43		0.58	-0.26		0.16	0.33	0.61

Notes: a. In yen per share.
b. RMSE = Root Mean Square Error
c. There were no statistically significant trends.

considered a simple measure of forecast bias. A negative (positive) error indicates that analysts, on average, overestimate (underestimate) earnings per-share. MAE and RMSE are measures of forecast accuracy. RMSE is calculated by summing the squares of each error, divided by the number of forecasting events, and taking the square root of this magnitude. The RMSE will magnify the effect of large forecast errors, as opposed to the MAE.

The most apparent pattern in Panel A is how the proportion of analysts predicting a loss increased during the decade of the 1990's for firms that experienced a loss. In addition, as the 1990's progressed, Panel A shows that there was an improvement in forecast accuracy, a reduction in optimistic bias and a reduction in the proportion of extremely negative forecast errors. Though there appears to be an improvement in forecast accuracy in Panel A during the 1990's, the change in accuracy was not statistically significant over the 10 year period of our study.

For firms reporting profits in Panel B there was no improvement in forecast accuracy and generally no reduction in the number of extremely positive forecast errors. There was also an increasing proportion of extremely negative forecast errors during the period. Finally, in Panel B, during the 1990's, the proportion of analysts forecasting losses for firms that subsequently reported profits marginally increased. This could be because, as the 1990's progressed, more firms were experiencing losses and more firms were moving in that direction. These results are in contrast to studies of U.S. analysts' forecasts that have shown significant improvement over time due to, among other things, an increase in communication between analysts and managers (Brown, 1998). Brown and Higgins (1999) also find that I/B/E/S forecast errors for Japanese firms have not decreased over time. They argue, however, that this is because foreign analysts no longer self-report actual earnings (see section above: *Studies of Earnings Management in Japan*).

With regard to forecast bias, in six of the 10 years where firms report profits (Panel B) analysts display a small pessimistic bias, whereas, when firms report losses (Panel A) analysts showed very significant optimistic bias in nine of 10 years. For the entire sample period, the extremely optimistic bias for firms reporting losses and the small pessimistic bias for firms reporting profits is not, therefore, driven by events in any single year.[19]

Does Firm Size Have a Relationship to Forecast Accuracy and Bias?

When forecasting earnings for small firms, analysts may not always

[19] Because a large optimistic bias is found for firms that experience losses, our study also indicates that the sign, magnitude, and level of significance of mean forecast errors for the entire samples can vary in research studies depending on the mix of firms experiencing profits and losses (see, Brown [1998]).

Table 3: The Effect of Firm Size on Forecast Accuracy and Bias (1988-97)

Groups Ranked by Market Value		Forecast Accuracy[a] Absolute Forecast Error |Actual-Forecast|			Forecast Bias[a] Signed Forecast Error (Actual-Forecast)		Firm Size Shares Outstanding x Price at Beginning of Fiscal Year (million yen)		Net (Loss) Profit (million yen)	
Panel A: Firms Reporting Losses (N = 207)										
	N	Mean	Std. Dev.	RMSE[b]	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
1 (Small)	62	11.49	7.88	13.89	-10.24	9.47	71,059	33,848	(-2,547.00)	3,049.87
2	66	9.19	7.08	11.57	-8.69	7.08	170,185	70,104	(-6,965.74)	13,053.72
3	35	7.41	7.58	10.51	-7.18	7.80	317,606	101,029	(-7,359.31)	95,08.38
4	15	8.16	9.26	11.90	-7.46	9.87	642,162	189,556	(-21,183.80)	37,163.49
5 (Large)	29	8.90	8.04	12.10	-7.59	9.33	1,511,990	655,840	(-49,980.76)	59,489.79
Panel B: Firms Reporting Profits (N = 1,353)										
	N	Mean	Std. Dev.	RMSE[b]	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
1 (Small)	259	3.91	4.60	6.03	0.15	6.04	107,778	52,006	2,101.73	2,344.61
2	257	4.43	5.72	7.22	-0.55	7.22	229,195	81,952	4,448.06	3,361.49
3	292	4.36	4.77	6.46	-0.22	6.46	390,475	139,979	8,198.07	6,265.06
4	288	4.10	5.19	6.60	0.37	6.60	792,459	280,885	18,935.20	11,955.31
5 (Large)	257	5.80	7.38	9.36	-0.09	9.39	2,479,495	3,514,933	53,859.02	52,096.61

Notes: a. In yen per share.
b. RMSE = Root Mean Square Error

be well informed (Bhushan, 1989). Further, they may have little at stake when they make their forecasts, and thus, little time and effort may be devoted to making these forecasts. Small firms also tend to be less stable and reside in less mature industries, making their earnings more difficult to predict (Anthony and Ramesh, 1992). Therefore, we examine whether patterns in forecast accuracy and the overall optimistic bias of the entire sample are possibly attributable to the small firms in the sample.

In Table 3, all the 164 firms in our sample, whether reporting profits or losses, were grouped together and ranked by magnitude of market capitalization at the beginning of each fiscal year. Five equal size categories were created.[20] Then, within each size category, firms reporting losses were separated from firms reporting profits, creating panels A and B of Table 3. Thus, the firms reporting losses in Panel A in a given size group are the same capitalization size as the firms reporting profits in Panel B in the same size group. In Panel A, forecast accuracy (for firms reporting losses), as measured by absolute forecast error, increased 20 percent from group one to group two, and continued to increase 20 percent from group two to group three. However, forecast accuracy decreased 10 percent from group three to group four, and continued to decrease nine percent from group four to group five. In Panel B, forecast accuracy (for firms reporting profits) remained fairly constant for the first four groups, however, for group five, it decreased about 41 percent from group four. RMSE also indicates that forecast accuracy is lower for the largest firms.

If firm size were positively related to forecast accuracy, we would expect to find that the absolute forecast error would be larger for small firms in group one reporting profits than for large firms in group five reporting losses. However, this is not true. The forecast error for group five (Panel A) is more than twice that of group one (Panel B). Additional support that size and forecast accuracy are not positively related is that, in Panel A, as firm size increases, forecast error decreases to group three and then begins to increase again while, in Panel B, the forecast error is the highest for group five. These results are strikingly similar to those in Hwang *et al.* (1996) who show that firm size is not directly related to forecast accuracy but, rather, that forecast accuracy is related to the magnitude of profit or loss that firms report. We cannot fully examine Hwang *et al.*'s explanation until we sort the sample by the magnitude of losses and profits, which will be done later in this paper.

With regard to forecast bias, Panel A in Table 3 shows that the optimistic bias is largest for small firms. Progressing from groups one to three, the optimistic bias decreases.

[20] Because actual earnings or forecasts are sometimes missing in JCH the number of observations are not the same in each size group.

Table 4: The Effect of the Magnitude of Loss or Profit Per Share on Forecast Accuracy and Bias (1988-97)

Groups Ranked by Magnitude of (Losses) or Profits On a Per Share Basis		Forecast Accuracy[a] Absolute Forecast Error |Actual-Forecast|			Forecast Bias[a] Signed Forecast Error (Actual-Forecast)		Firm Size Shares Outstanding x Price at Beginning of Fiscal Year (million yen)		Net (Loss) Profit (million yen)	
Panel A: Firms Reporting Losses (N=207)										
	N	Mean	Std. Dev.	RMSE[b]	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
1 (Small)	42	4.21	3.52	5.46	-3.32	4.38	342,103	463,106	(-1,211.33)	1,584.55
2	41	7.52	5.54	9.30	-6.51	6.73	391,269	428,944	(-3,823.07)	4,374.45
3	42	7.51	5.92	9.52	-7.05	6.49	376,573	444,872	(-10,129.88)	13,127.64
4	41	11.76	7.49	13.89	-11.28	8.21	264,243	408,922	(-8,973.10)	10,361.19
5 (Large)	41	16.48	9.12	18.78	-15.27	11.06	565,215	828,492	(-40,035.10)	57,359.06
Panel B: Firms Reporting Profits (N=1,353)										
	N	Mean	Std. Dev.	RMSE[b]	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
1 (Small)	277	3.68	5.30	6.45	-2.14	6.09	435,368	456,462	2,975.64	3,871.53
2	269	2.74	3.32	4.30	-0.87	4.21	501,891	523,552	6,990.92	8,514.48
3	269	3.80	4.50	5.88	-0.18	5.89	542,518	719,679	10,790.90	14,267.11
4	269	4.80	5.01	6.93	0.69	6.91	727,182	722,681	19,181.19	20,262.96
5 (Large)	269	7.54	7.75	10.80	2.25	10.58	1,716,986	3,561,791	46,874.13	52,012.55

Notes:
a. In yen per share.
b. RMSE = Root Mean Square Error

However, moving from group three to group five, the optimistic bias increases very marginally. Brown (1998) examined whether the reason for the greater optimistic bias is because small firms tend to take an "earnings bath" more often than large firms. His examination, however, did not find that small firms experienced extremely negative forecast errors more often than large firms, and he concluded that small firms were not more likely to take earnings baths. Similar to Brown, we also found (results available from authors on request) that firms in groups one and two had fewer extremely negative forecast errors relative to those in groups three, four, and five. A more likely reason for the greater optimistic bias for small firms appears to be that small firms experience losses more frequently than large firms (see also Brown, 1998). For the entire sample, the percentage losses experienced in groups one to five were 19 percent, 20 percent, 11 percent, five percent and 10 percent respectively. Lastly, with regard to forecast bias for firms reporting profits, Table 3 Panel B shows that this is nonexistent, regardless of size.

Overall, we conclude that firm size does not explain the asymmetric patterns in forecast accuracy and bias for firms reporting losses versus those reporting profits. Similar to Hwang *et al.* (1996), we next explore whether the magnitude of loss and profit can explain the systematic patterns in forecast accuracy and bias.

Does the Magnitude of Profit or Loss Affect Forecast Accuracy and Bias?

In Table 4, for both Panels, observations were ranked by the magnitude of loss (Panel A) or magnitude of profit (Panel B) stated on a per share basis and then divided into five equal categories.[21] In Panel A, we find that, as losses per share increase, so does the absolute forecast error, the root mean square error, and the optimistic bias. There is clearly a significant difference in forecast accuracy between groups one and five (t-value=8.13). There is a 291 percent decrease in forecast accuracy and a 360 percent increase in forecast bias moving from groups one to five. In Panel B we can see that forecast accuracy also decreases as firm profitability increases. The largest increase in mean absolute forecast error and RMSE is from group four to group five, which was 57 percent and 56 percent, respectively. This suggests that analysts also have difficulty predicting large profit situations.

These findings are similar to those in Hwang *et al.* (1996) and support the idea that firms do not consistently experience large profits and analysts, therefore, have difficulty predicting these transitory occurrences. This same argument can also explain the large magnitude of forecast errors

[21] Because the magnitude of profits and losses is likely to be correlated with firm size, we deflate by shares outstanding. Our results without deflation leads to a conclusion similar to that discussed.

Table 5: Relationship of Annual Earnings with First and Fourth Quarter Forecasts Thereof (1988-97)

Groups By Sign of First Quarter Forecast Error	Direction of Forecast Revision from First to Fourth Quarter (F_{qrt4}-F_{qrt1})	Fourth Quarter Forecast Error (EPS-F_{qrt4})	N	First Quarter Forecast Error[a] (EPS-F_{qrt1}) Mean	First Quarter Forecast Error[a] Std. Dev.	Fourth Quarter Forecast Error[a] (EPS-F_{qrt4}) Mean	Fourth Quarter Forecast Error[a] Std. Dev.
Panel A: Firms Reporting Losses (N=207)							
Group I: N = 17 Firms with Positive First Quarter Forecast Errors (EPS-F_{qrt1} > 0)	Upward	Positive	6	9.57	9.42	2.11	1.63
	Upward	Negative	2	0.81	0.47	-3.55	3.19
	Downward	Positive	3	1.64	2.05	4.36	3.14
	No Change	Positive	6	3.81	4.38	3.81	4.38
Group II: N = 190 Firms with Negative First Quarter Forecast Errors (EPS-F_{qrt1}) < 0	Downward	Negative	105	-15.85	7.29	-10.65	7.59
	Downward	Positive	16	-6.85	6.06	2.20	2.16
	Upward	Negative	10	-8.82	9.41	-11.87	8.52
	No Change	Negative	59	-10.69	8.08	-10.69	8.08
Panel B: Firms Reporting Profits (N=1,351)							
Group III: N = 681 Firms with Positive First Quarter Forecast Errors (EPS-F_{qrt1} > 0)	Upward	Positive	282	8.03	6.77	4.60	6.46
	Upward	Negative	94	3.90	5.43	-3.39	4.69
	Downward	Positive	85	4.29	6.59	7.61	7.49
	No Change	Positive	220	3.94	5.21	3.94	5.21
Group IV: N = 670 Firms with Negative First Quarter Forecast Errors (EPS-F_{qrt1}) < 0	Downward	Negative	281	-8.40	6.45	-5.13	6.24
	Downward	Positive	89	-4.75	5.91	2.19	3.26
	Upward	Negative	79	-3.85	4.86	-6.17	5.77
	No Change	Negative	221	-3.63	4.39	-3.63	4.39

Notes: a. In yen per share.

when firms report losses.

As shown in Table 4, the mean absolute forecast error for each group of firms reporting losses (Panel A) is greater than the mean absolute forecast error for the corresponding group reporting profits (Panel B) which shows that while large profits are transitory and difficult to predict, losses are perceived to be even more transitory and even more difficult to predict.

How do Forecasts of Annual Earnings Made in the Fourth Quarter Compare to Those Made in the First Quarter?

Richardson *et al.* (1999) find that analysts' forecasts of annual earnings made in the first quarter are generally higher than their forecasts made in subsequent quarters. Our results support this finding only where firms experience losses. Specifically, in Table 5 (Column 2, Panel A), we find that, when firms report losses and analysts revise their forecasts of annual earnings announced in the first quarter of the year, in 87 percent of those cases, analysts revise their forecasts downward, while in only 13 percent of those cases did they revise their forecasts upward. However, in Column 2 of Panel B, in cases where firms report profits and analysts revise their forecasts, downward revisions take place only 50 percent of the time while upward revisions are also made 50 percent of the time. In both Panels A and B, it is interesting to note that, in one-third of all cases, no revisions of annual earnings forecasts took place at all. With the exception of a few cases (11 percent), as would be expected, there is generally a significant improvement in annual forecast accuracy from the first to the fourth quarter.

We next examine whether there was any change in the forecast bias between forecasts of annual earnings made in the first and fourth quarters. For the 207 firms reporting losses, in 190 cases (92 percent) analysts had issued optimistic forecasts of annual earnings in the first quarter (Group II, Panel A). This bias decreased slightly for the fourth quarter predictions of annual earnings, where in 176 cases (85 percent) forecasts continued to exhibit optimistic bias (Column 3, Panel A). However, there was a significant increase in forecast accuracy for 105 cases that originally had negative forecast errors (55 percent) that led to a 33 percent reduction in the forecast bias.

In Panel B, there was an equal number of optimistic (681 cases or 50 percent) and pessimistic (670 cases or 50 percent) forecasts of annual earnings issued in the first quarter. In the fourth quarter the proportions of optimistic-pessimistic forecasts of annual earnings were the same. The "unbiasedness" of analysts' forecasts for firms that reported profits clearly remains constant from their first to their fourth quarter forecasts of annual earnings.

How Informative are Earnings Forecasts?

In this section we examine in more detail the asymmetric aspects of annual earnings and annual earnings

forecasts that were illustrated in previous sections. Consider the symmetric regression of the form shown here:

$$A_{it} = \tilde{a}_1 + \tilde{a}_2 F_{it} + \grave{u}_{it} \quad (1)$$

Where A_{it} denotes the actual net profit or loss of firm i in year t, F_{it} denotes forecasted level of net profit or loss for firm i in year t, and ù is a stochastic disturbance term.

In such a regression, if the null hypothesis that $\tilde{a}_1 = 0$ and $\tilde{a}_2 = 1$ cannot be rejected, then the forecasts are said to be unbiased predictors of actual profits or losses. If, however, $\tilde{a}_1 < 0$, this means that, on average, the forecasts over predict the actual value. Likewise, if $\tilde{a}_1 > 0$, the forecasts, on average, under predict the actual value.

The above relation assumes that forecasters respond in the same way regardless of whether actual results are profits or losses. However, the descriptive analysis and histograms presented earlier suggest that during periods in which firms experience losses, forecasts tend to be overly optimistic, while during periods where firms experience profits, forecasts appear to be reasonably accurate. In an effort to take into account such asymmetry we estimate the following asymmetric regression model:

$$A_{it} = \acute{a}_1 I^+_{it} + \acute{a}_2 I^-_{it} + \hat{a}_1 I^+_{it} * F_{it} + \hat{a}_2 I^-_{it} * F_{it} + \mathring{a}_{it} \quad (2)$$

Where I^+_{it} denotes an indicator variable that is equal to 1 when firm i in year t experiences a profit and 0 otherwise. I^-_{it} denotes an indicator variable that is equal to 1 when firm i in year t experiences a loss and 0 otherwise. A_{it} and F_{it} are as defined in equation (1).

Table 6 on the next page presents estimates of equation (2), for the first and fourth quarter forecasts of annual earnings. The traditional method of estimation would be to begin with ordinary least squares (OLS) estimation of equation (2). However, an examination of the OLS residuals from equation (2) reveals that their distribution is leptokurtic (fat tailed) looking like a Cauchy or Student's t distribution. Since the estimated coefficients from OLS estimation (which assumes normally distributed residuals) are sensitive to large residuals, OLS is not the preferred estimator in such circumstances. An estimator that leads to more efficient coefficients and standard errors is the Least Absolute Deviation (LAD) estimator. Rather than minimizing the squared deviations (as does the OLS estimator) the LAD estimator minimizes the absolute deviations. Simply put, this estimator places a smaller weight on larger residuals. Not surprisingly, we find that when we eliminate residuals that are more than three standard deviations from the mean, the LAD and OLS results yield very similar results. As we would like to use all information, we employ the LAD estimator.[22]

[22] For more information on the LAD estimator as well as other Robust estimators see Judge, et. al. [1988], Amemiya [1985 p. 71].

Table 6: Regression of Analysts' First and Fourth Quarter Forecasts on Actual Earnings

Model: $A_{it} = \alpha_1 I_{it}^{+} + \alpha_2 I_{it}^{-} + \beta_1 I_{it}^{+} * F_{it} + \beta_2 I_{it}^{-} * F_{it} + \varepsilon_{it}$

Independent Variables	Estimated Coefficients (t-values)	
	1st Qtr.	**4th Qtr.**
α_1	-0.062 (0.113)	-0.130 (-.408)
α_2	-10.122 (-7.257)	-7.233 (-8.883)
β_1	1.000 (-1853.56)	1.009 (-3363.91)
β_2	0.505 (5.825)*	0.936 (63.68)*
DW	2.16	3.20
Adj. R^2	.957	.9908
N	1,552	1,546

* The t-value for the null hypothesis that β_2 is equal to 1 for quarter 1 is 5.7 and 4.31 for quarter 4.

NOTES:

a. I^{+}_{it} = an indicator variable which is equal to 1 when net profits ≥ 0, otherwise, it is 0, for firm i in year t.
b. I^{-}_{it} = an indicator variable which is equal to 1 when net profits < 0, otherwise, it is 0, for firm i in year t.
c. A_{it} = Actual net profit or loss of firm i in year t.
d. F_{it} = Forecast of net profit or loss for firm i in year t.

The results show that there is a striking difference between first and fourth quarter estimates of annual earnings when firms subsequently experience profits versus losses. The null hypothesis that $\hat{a}_1 = \hat{a}_2$ is strongly rejected as is the null hypothesis that $\acute{a}_1 = \acute{a}_2$. The results indicate that when net profits are experienced, first quarter forecasts of annual earnings are efficient and unbiased as we cannot reject the null that $\acute{a}_1 = 0$ and $\hat{a}_2 = 1$. In contrast, the results indicate that first quarter forecasts of annual earnings made when firms subsequently report losses are highly biased in that they are overly optimistic. This is evidenced by the large negative and significant value for $\acute{a}_2$. This overly optimistic bias decreases as we move from quarter one to quarter four, however, the null hypothesis that $\hat{a}_2 = 1$ is still rejected in the fourth quarter for firms subsequently reporting losses.

IS THE BIAS OF ANALYSTS' FORECASTS THE RESULT OF EARNINGS AND/OR FORECAST MANAGEMENT?

Thus far we have presented evidence that the overall sample

possesses an optimistic bias that is mostly driven by a few extremely negative forecast errors of firms reporting losses. We have also shown that because losses are transitory in nature, analysts have difficulty in forecasting these events, often resulting in extremely negative forecast errors.

In this section we examine whether the asymmetric distribution documented above is the result of two types of management manipulation of analysts' forecast errors: earnings management (where the earnings component is managed) and forecast management (where the forecast component is managed). To test for forecast management, we examine whether the need to have actual earnings equal to or slightly exceed forecasted earnings becomes more important to management as the fourth quarter approaches. Specifically, we obtain the change in forecasts from the first to fourth quarters and examine whether, as a result of the change, the firm is able to achieve the revised forecast. To test for earnings management, we examine whether discretionary accruals are used to achieve analysts' forecasts. In particular, we test whether the greater proportion of small positive forecast errors decreases and is close to the proportion of negative forecast errors under conditions where discretionary accruals are reversed. In addition, we examine whether managers take large income decreasing discretionary accruals when managers are unable to achieve the analysts' forecasts.

Does Management Influence Analysts to Revise Forecasts Downward to Achieve Positive Forecast Errors?

Table 5 (shown previously) should give us an insight into forecast management by examining situations where analysts reduced their forecasts from the first to the fourth quarter that then resulted in the firms achieving the revised forecasts. The above case would be particularly true where the first quarter forecasts were not achieved. Of the 190 cases in Panel A, Group II, where firms did not achieve the first quarter forecasts, there were only 16 cases (eight percent—see Column 3) where a downward revision resulted in firms achieving their revised forecasts. In Panel B, Group IV, there were only 89 (13 percents—see Column 3) of the 670 cases where downward revisions were made that resulted in firms exceeding their revised forecasts. Our results, therefore, do not indicate the existence of significant forecast management in Japan. We acknowledge that because the number of observations available for our analyses were small, particularly in the loss sub-sample, these results should be interpreted with caution.

Does Earnings Management Explain Japanese Analysts' Large Optimistic Bias for Firms Reporting Losses and Small Pessimistic Bias for Firms Reporting Profits?

Because discretionary accruals are not observable, they are computed

Table 7: The Effect of Earnings Management on Analysts' Forecast Errors (1988-97)

Groups Ranked by the Magnitude of Forecast Errors (FE)[a]		Discretionary Accruals as a Proportion of Total Assets[b,c]		Special Gains and Losses as a Proportion of Total Assets[b]	
Panel A: Firms Reporting Losses (N=186)					
	N	Mean	Std. Dev.	Mean	Std. Dev.
25 < FE	0	.	.	.	.
10 ≤ FE < 25	1	0.026	.	-0.032	.
5 ≤ FE < 10	5	-0.058	0.083	-0.007	0.038
1 < FE < 5	13	0.001	0.037	0.005	0.037
0 ≤ FE ≤ 1	12	-0.026	0.040	-0.010	0.021
-1 ≤ FE < 0	5	-0.022	0.031	-0.026	0.043
-5 ≤ FE < -1	46	-0.013	0.035	-0.003	0.009
-10 ≤ FE < -5	41	-0.003	0.040	-0.004	0.009
-25 ≤ FE < -10	43	-0.004	0.052	-0.001	0.014
FE < -25	20	0.004	0.065	-0.008	0.031
Panel B: Firms Reporting Profits (N=1,245)					
	N	Mean	Std. Dev.	Mean	Std. Dev.
25 < FE	20	-0.024	0.055	0.000	0.029
10 ≤ FE < 25	60	-0.013	0.052	0.005	0.037
5 ≤ FE < 10	100	-0.008	0.050	0.002	0.015
1 < FE < 5	291	-0.007	0.053	-0.002	0.008
0 ≤ FE ≤ 1	171	0.004	0.045	-0.001	0.008
-1 ≤ FE < 0	139	-0.001	0.046	-0.001	0.018
-5 ≤ FE < -1	289	0.008	0.060	-0.002	0.007
-10 ≤ FE < -5	109	-0.003	0.041	-0.001	0.007
-25 ≤ FE < -10	43	0.007	0.044	0.001	0.023
FE < -25	23	-0.007	0.051	-0.001	0.005

Notes:

a. Forecast errors (FE) are in yen per share.

b. When the proportion of accruals and special gains and losses to total assets equals or exceeds 1%, it is assumed that the firm took a "bath".

c. Discretionary accruals could not be computed for 129 cases because of missing data.

using the Jones (1991) model, as modified by Dechow *et al.* (1995). The resulting formula is:

$$TACC_{it}/TASS_{it-1} = á_1(1/TASS_{it-1}) + á_2(ÄREV_{it} - ÄREC_{it})/TASS_{it-1} + á_3(PPE_{it}/TASS_{it-1}) + å_{it} \quad (3)$$

Where TACC is total accruals which is net income before extraordinary items less operating cash flow, TASS is total assets, ÄREV is the change in revenue, ÄREC is the change in accounts receivable and PPE is gross plant, property and equipment.

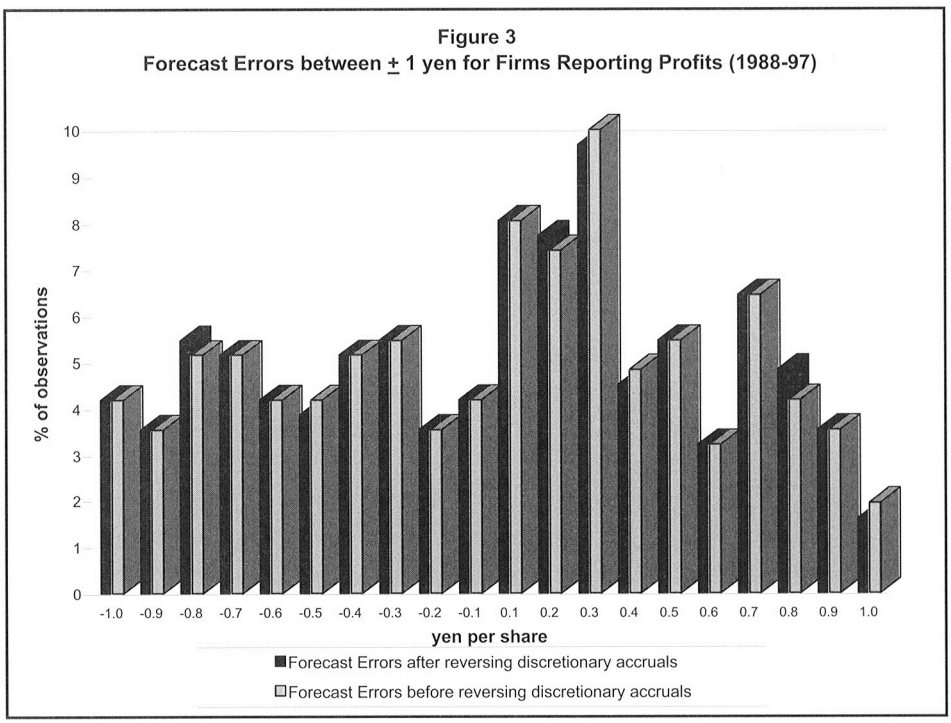
Deflating by TASS controls for scale bias while (ÄREV-ÄREC) and PPE control for non-discretionary levels of working capital accruals related to revenues and depreciation expense, respectively. $å_{it}$ is the residual which

is used to proxy for abnormal, discretionary accruals. The model is estimated using OLS for each sample year allowing for coefficients to vary with industry.[23]

An earnings bath is defined as discretionary accruals that are in excess of one percent of total assets. An examination of negative forecast errors greater than five yen indicates that discretionary accruals did not contribute in any way to a firm's loss. For firms reporting profits, the only apparent use of discretionary accruals to manage income is in those situations where the positive forecast error was more than 10 yen. In these cases, discretionary accruals were used to drive earnings down, which supports management seeing no value in having actual earnings exceeding forecasts by a large amount. An interesting result from Panel B of Table 7 (shown on the prior page) is that there are marginally more firms (55 percent) reporting forecast errors between zero and +1 yen per share, and fewer firms (45 percent) reporting forecast errors between -1 and zero yen per share. We examined if the skewness was due to earnings management. Figure 3 (below) plots forecast errors over this range based on reported net income and income after reversing discretionary accruals. As can be seen, the cause of the skewness is not due to discretionary accruals.

Finally, Okabe (1999) argues that Japanese managers manage earnings with sales of real estate and investments. Gains and losses arising

Figure 3
Forecast Errors between ± 1 yen for Firms Reporting Profits (1988-97)



[23] We use the industry definitions in the JCH.

from these transactions are classified as special gains and losses on the income statement. We did not find evidence that Japanese managers used real estate and investment sales to achieve analysts' forecasts or to take a "big bath" (see Table 7).

SUMMARY AND CONCLUSION

Many studies have reported results suggesting that earnings' forecasts made by U.S. analysts display an optimistic bias (i.e., forecasted earnings exceed actual earnings). Different explanations have been offered to explain this phenomenon. Some studies focus on the behavior of the analysts making the forecasts while others examine the behavior of the managers whose firms' earnings are being forecasted. With respect to the analysts, one explanation is simply that the analysts are not able to make rational forecasts of earnings. A second line of reasoning focuses on the behavior of managers, and looks at whether the optimistic bias is the result of certain kinds of earnings management or, possibly, the result of firms having the ability to manage analysts' forecasts.

This paper investigates whether the optimistic bias and asymmetric behavior of forecast errors found in most U.S. studies exists in Japan. While Japan has the second largest stock market in the world with significant international investment in its stocks, there has been no investigation of biases in analysts' forecasts of Japanese firms. In this paper we examine Japanese firms that were included on the Nikkei 225 Index every year from 1988 through 1997. We find that there is a fundamental difference in the distribution of forecast errors for firms reporting losses versus those reporting profits. Our results suggest that during periods in which firms experience losses, forecast accuracy is extremely poor and extremely significant optimistic bias occurs. However, when firms report profits, there is much greater forecast accuracy and only a small pessimistic forecast bias occurs. Our results, therefore, indicate that the optimistic bias for the entire sample of forecast errors is driven by the extremely negative forecast errors of a few firms reporting losses.

Employing regression analysis, we also find that there is a striking difference in forecast bias when firms experience profits versus losses. The results indicate that, when net profits are experienced, forecasts are efficient and unbiased. In contrast, when firms report losses, the forecasts made are highly biased in that they are overly optimistic. The bias decreases only slightly as we move from the first to the fourth quarters and approach the end of the year.

Given biased forecasts in Japan, we attempt to determine whether the cause of this bias is the result of analysts' irrationality or due to either earnings management or forecast management. Similar to other U.S. studies, we find that firm size does not explain the asymmetric patterns in forecast accuracy and bias for firms reporting losses versus those reporting

profits. Instead, our results suggest that analysts in Japan have difficulty forecasting losses/ large profits due to their transitory nature. Specifically, we show that forecast accuracy and bias are related to the magnitude of profit/loss a firm reports.

Finally, we investigate whether the large negative forecast errors for firms experiencing losses and small positive errors for firms reporting profits are the result of discretionary accruals used by managers (i.e., earnings management). The few papers that have investigated earnings management to date in Japan have primarily examined contractual incentives of Japanese managers to smooth income. The present paper follows the recent approach in the U.S. by focusing on capital market incentives and provides evidence of an additional type of earnings management other than income smoothing. We find no evidence to support that either earnings or forecast management are related to the asymmetric patterns in forecast accuracy and bias. Thus, while managers in Japan may manage earnings, they do not do so in the same manner as it is often accomplished in the United States. This is most likely due to the fact that the extreme negative reaction of U.S. stock prices to not meeting analysts' forecasts is not present in the Japanese stock market. This is consistent with Brown and Higgins (1998) and Ball *et al.* (1998) that show stock markets in Japan are not nearly as responsive to earnings news as are U.S. markets.

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