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An analysis of Japanese earnings forecast revisions with application to seasoned equity offerings

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Abstract: Using the bootstrap method, we explore the characteristics of revisions in Japanese earnings forecast data. We find that forecast revisions exhibit a downward trend over time as the actual earnings announcement date approaches, and are serially correlated with three significant lags. Using these characteristics we develop a model to estimate abnormal forecast revisions, and illustrate the model's use with a sample of Japanese companies announcing seasoned equity offerings (SEOs). In contrast to results obtained by studies using American data, our findings indicate significant positive upward revisions when Japanese firms announce an SEO.

Keywords: Earnings forecast revisions, Japanese seasoned equity offerings

1. Introduction

Beginning in the late-1980s, researchers began to more closely examine the Japanese financial markets in order to shed more light on how the world's second largest economy allocates its capital. Whether the subject is initial public offerings (IPOs) (e.g., Jenkinson (1990)), seasoned equity offerings (SEOs) (e.g., Kang, Kim, Park, & Stulz, 1996), the cost of capital (e.g., Frankel, 1991), or the stock market (e.g., Chan, Hamao, & Lakonishok, 1991), this was a period during which international researchers began to focus on Japanese financial markets. Exploration of Japanese markets continues today with recent work on IPOs (e.g., Kerins, Kutsuna, & Smith, 2007), SEOs (e.g., Cooney, Kato, & Schallheim, 2003), firms' cost of capital (e.g., Goyal & Yamada, 2004), and the stock market (e.g., Ahn, Cai, Hamao, & Ho, 2005).

Many of these papers include an event study analysis of the market reaction to various informational events. In a typical event study, market- or risk-adjusted stock returns are examined on the days surrounding the informational event of interest. If statistically significant adjusted returns are found they are assumed to have been triggered by the event's implications for stock value. Since expected cash flow is a fundamental variable in stock valuation, informational events that affect the market's cash flow expectations should also affect stock returns. Researchers have studied changes in cash flow expectations through revisions in analysts' earnings forecasts. Basyah and Hartigan (2007) find earnings forecast revisions subsequent to anti-dumping petitions. Fried and Givoly (2002) show that analysts' forecasts are more closely associated with stock price changes than are forecasts generated by time-series models of stock prices themselves. Arbanell, Lanen, and Verrecchia (1995) develop a theoretical model of stock trading in which earnings forecasts are explicitly incorporated as a fundamental component in setting the market's expectations for future returns. However, analysts' forecasts are not perfect. O'Brien (1988) shows that early forecasts are systematically revised downward over time implying an optimism bias. Brous (1992) finds serial correlation in the time series of earnings forecasts, develops corrections for both serial correlation and O'Brien's (1988) optimism bias, and provides a methodology to estimate abnormal forecast revisions.

Improving upon the Brous (1992) methodology, we use the bootstrap method to study the empirical properties of revisions in Japanese earnings forecast data, and illustrate use of the resulting empirical model by examining forecast revisions for a sample of

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Japanese SEOs.[1] While we are aware of no study of Japanese earnings forecast data, several papers have documented that announcements of Japanese SEOs produce stock returns different from those found using U.S. SEO data. For example, Kang et al. (1996) document that announcements of Japanese offshore, dollar-denominated convertible bonds, equity-like instruments, produce abnormal returns averaging +0.5%, while in contrast, Mikkelson and Partch (1986) find average abnormal returns of −1.97% for a sample of U.S. convertible bond issues. Kang and Stulz (1996) find that under special circumstances, SEO announcements by Japanese companies result in positive abnormal returns of +0.45%, while in contrast Masulis and Korwar (1986) find abnormal announcement period returns of −3.15% for their U.S. sample of SEOs. Finally, Brous (1992) reports negative and significant abnormal earnings forecast revisions subsequent to SEO announcements of a sample of U.S. firms. We are the first to analyze forecast revisions surrounding Japanese SEO announcements.

We find that Japanese earnings forecast data are both subject to optimism bias, and exhibit serial correlation, indicating that these characteristics are neither a function of some peculiarity in U.S. data, nor are they limited to analysts covering American companies. Using our empirical model that corrects for these biases, we study the SEO announcements of a sample of Japanese firms, and find statistically positive abnormal forecast revisions that average nearly 22%. These revisions are positively related to abnormal stock returns surrounding the SEO announcements, which is consistent with our premise that earnings forecast revisions proxy for changes in underlying cash flow expectations. Unlike in the U.S., SEO announcements in Japan convey positive information to earnings forecasters and the market.

In the following section we explore the characteristics of Japanese earnings forecast data, and use them to develop an abnormal forecast revision model. In section 3, we illustrate use of the model by examining the earnings forecast revisions of Japanese companies announcing SEO. Section 4 concludes the paper.

2. Earnings forecast revisions

In this section, we explore the empirical characteristics of revisions to Japanese earnings forecast data. Brous (1992) explores the properties of U.S. earnings forecast data by forming a portfolio of 500 randomly selected firms included in Standard & Poor's *Institutional Broker Estimation System* (IBES). We improve upon the Brous (1992) methodology through use of the bootstrap method to better estimate the properties of Japanese earnings forecast data.

2.1. Properties of Japanese earnings forecast revisions

Our initial sample consists of all 3343 firms included in Japanese earnings forecast data provided by IBES over the period 1990 to 2003. The IBES item of interest is the mean earnings forecast for each company across all analysts covering the company. Our first data filter requires sample companies to have at least 60 months of forecast data on the IBES database. This requirement is necessary for estimation of model parameters and cuts the sample to 1513 Japanese firms.

We use a simulation procedure based on the bootstrap method (see, e.g., Chernick (2008)) in order to learn about the large-sample characteristics of revisions in Japanese earnings forecast data. First, we randomly select, with replacement, a "non-event" date between January 1, 1990 and December 31, 2003. Next, we pair each randomly selected non-event date with a Japanese company by randomly selecting, with replacement, one of the 1513 companies. We repeat this procedure 500 times producing a portfolio of 500 randomly selected companies each paired with a false event date. Finally, we repeat this procedure 1000 times in order to develop 1000 different 500-firm non-event portfolios.[2]

Following Brous (1992), we define earnings *forecast revision* (FR) as:

$$FR_{i,t} = \frac{F_{i,t} - F_{i,t-1}}{P_{i,t-1}} \tag{1}$$

where $FR_{i,t}$ is the forecast revision for firm i in month t; $F_{i,t}$ and $F_{i,t-1}$ are the mean values of analysts' earnings forecasts for firm i in months t and t−1, respectively, as reported by IBES; $P_{i,t-1}$ is the stock price for firm i at the end of month t−1; and month t is the month of the randomly selected non-event.

We compute FR for each firm in month t, as well as the mean, standard deviation, and *t*-statistic of each of the 1000 portfolios' FR. If forecast revisions are unbiased then the set of 1000 mean forecast revisions should be distributed around zero. The grand mean (median) FR across all 1000 portfolios is −0.00287 (−0.00209), with a maximum (minimum) portfolio mean FR value of 0.037 (−0.085). The mean (median) *t*-statistic across the 1000 portfolios is −1.80 (−1.87) and the maximum (minimum) *t*-statistic is 1.06 (−4.19). Fig. 1 is a histogram of the *t*-statistics for the 1000 portfolios illustrating that well over half of the portfolios are significantly negative at the 10% level. In fact, in 608 of the 1000 portfolios, the *t*-statistic for the mean FR is significantly different from zero at the 10% level. Finally, none of the portfolios has a significantly positive mean FR. Clearly, revisions of the earnings forecasts of Japanese firms computed from the IBES International database are negatively biased.[3]

[1] Chiou, Lee, and Lee (2010) document that Japanese companies issue securities under Japan's civil law-based legal system as opposed to a common law-based legal system.

[2] Not all 500 firms have data on the randomly chosen non-event date. Because of this, the average 500-firm portfolio actually contains 385 companies. The maximum (minimum) number of firms in a 500-firm portfolio is 477 (340).

[3] The range of these statistics, illustrated in Fig. 1, clearly show the potential for bias in relying on one randomly selected portfolio to explore IBES data, as in Brous (1992). For example, the mean FR was not significantly different from zero in nearly 40% of our portfolios.

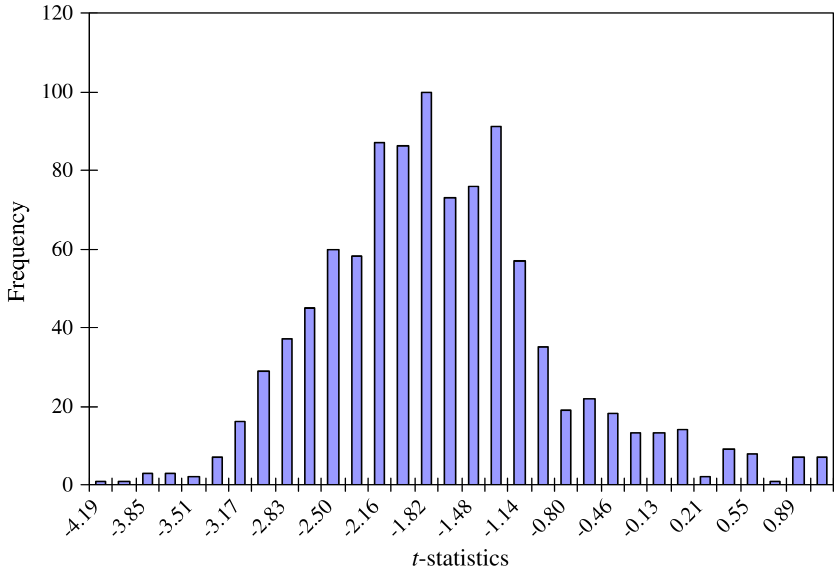

Fig. 1. Raw forecast revisions with outliers. This figure shows the empirical distribution of forecast revisions using a sample of Japanese companies contained in the IBES International database from which we form 1000 random 500-firm portfolios. The monthly revision in the mean forecast is calculated by dividing the difference between the forecasts from one month to the next by the firm's stock price per share in the prior month. This sample of forecast revisions contains outliers.

In their work with IBES data, both Ederington and Goh (1998) and Keane and Runkle (1998) report outlier problems. Therefore, we filter our sample in order to eliminate potential problems caused by outliers. Following Ederington and Goh (1998) we eliminate any FR if it falls more than five standard deviations from the mean FR for its 500-firm portfolio.[4] This process eliminates only 121 of the 385,031 observations across all 1000 simulated portfolios. These 121 omitted observations, however, have a significant effect on the sample statistics. The new grand mean (median) FR across all 1000 portfolios is −0.00219 (−0.00196), the mean (median) *t*-statistic is −1.91 (−1.97), and the range of the mean FR is much tighter now with maximum and minimum values of 0.0023 and −0.0101, respectively. The maximum and minimum *t*-statistics are unchanged at 1.06 and −4.19, respectively. Fig. 2 is a histogram of the *t*-statistics after filtering out the 121 outlier FR. As evident in the figure, despite the elimination of outliers the negative bias remains.

Next we test Japanese earnings forecast data for serial correlation, which Brous (1992) found to be present in U.S. data. First, we develop a twelve-month time series of forecast revisions centered on the non-event month t for each firm in all 1000 portfolios. We then regress each firm's forecast revision for month t on its own lagged forecast revisions. Statistically significant estimated coefficients on the lagged forecast revisions indicate serial correlation. Table 1 provides the results of four regression models in which firm data from all 1000 portfolios is pooled and lagged forecast revisions are added to the regression sequentially in order to test the marginal effect of each additional lag, and shows five interesting characteristics. First, in row one of the table, the significantly negative intercepts across all four models are consistent with the findings of O'Brien (1988), Brous (1992) and Ederington and Goh (1998), as well as Figs. 1 and 2. Absent new information, forecast revisions tend to be negative implying that earnings forecasts tend to be overly optimistic in general. Second, all estimated coefficients on lagged forecast revisions are positive indicating that FR are positively serially correlated. Third, neither the estimated coefficients nor their respective *t*-statistics are affected as lagged terms are added across the four models indicating that the lag structure is quite stable. Fourth, as lagged variables are added to the regression, the estimated coefficients on the marginal lagged FR are smaller and less statistically significant than the preceding lagged FR. And fifth, a lag structure with three significant lags is consistent with an empirical model in which it takes four months on average for new information to be fully reflected in the mean earnings forecast reported by IBES.[5] Recall that the variable FR is computed using the mean earnings forecast across all financial analysts. Only when all analysts update their forecasts will the mean forecast fully reflect the new information and obtain equilibrium with respect to the new information. For example, suppose a company releases unexpectedly positive information about its future prospects on March 1 of a given year. If, as the data indicates, only about one-quarter of the forecasts collected by IBES as of the end of March reflect the new information then the mean earnings forecast reported by IBES for March will be below its eventual equilibrium level. If in April and May another one-quarter of the forecasts are updated and reported to IBES, respectively, the mean forecast revision will gradually increase until June when the last one-quarter of the analysts update their forecasts and all forecasts fully reflect the information released March 1.

There appears to be a shorter period of serial correlation in Japanese earnings forecast data than in analogous U.S. data. Brous (1992, Table IV) reports five significant lags in IBES data covering U.S. companies. This difference between what we find using

[4] Over 50% of forecast revisions equal zero. Because of this, we calculate the standard deviation using only non-zero FR.

[5] In unreported results we add fifth and sixth lags, which are both insignificantly different from zero.

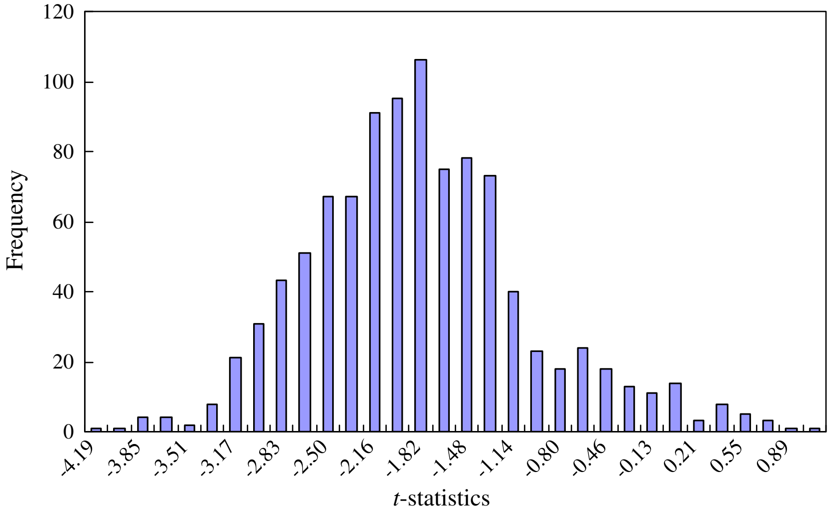

Fig. 2. Raw forecast revisions without outliers. This figure shows the empirical distribution of forecast revisions using a sample of Japanese companies contained in the IBES International database from which we form 1000 random 500-firm portfolios. The monthly revision in the mean forecast is calculated by dividing the difference between the forecasts from one month to the next by the firm's stock price per share in the prior month. Forecast revisions more than five standard deviations from the portfolio mean have been removed.

Japanese data and what Brous reports for U.S. data may be a result of the difference in sample periods, a difference between U.S. and Japanese data, or from our more rigorous use of the bootstrap method. Whatever the reason, in the next section we use our results to model expected earnings forecasts for Japanese companies, which we then use to calculate abnormal forecast revisions.

2.2. Abnormal earnings forecast revisions

In order to estimate expected forecast revisions, we follow Brous (1992) and assume the forecast revision process is described as follows:

$$\mathrm{FR}_{i,t} = k_i + \varepsilon_{i,t} \tag{2}$$

where k_i is a forecastable component and $\varepsilon_{i,t}$ is a random unforecastable component. We estimate the expected forecast revision for firm i in month t as follows:

$$E[\mathrm{FR}_{i,t}] = k_i + \left(\frac{1}{n}\right)\sum_{c=1}^{n-1}\varepsilon_{i,t-c} \tag{3}$$

where n equals the number of lagged months required for serial correlation to fully disperse. The forecastable component, k_i, is the mean forecast revision for company i estimated using all months of earnings forecasts for each firm excluding the 13-month sample period beginning six months prior to the non-event date, month t, and ending six months afterwards.[6] The unforecastable components, $\varepsilon_{i,t-c}$, are equal to the lagged differences between k_i and the actual monthly forecast revisions for firm i in months $t-c$. Consistent with our findings above, we set $n=4$ in equation 3, which is equivalent to assuming that analysts' forecasts follow a third-order moving average process. A third-order process is consistent with a four-month lag in analysts' revisions.

We rerun the simulation by randomly selecting a new set of date/company pairs between January 1, 1990 and December 31, 2003, eventually producing 1000 new portfolios of 500 randomly selected companies with randomly selected false event dates.[7] Defining month t as the non-event month, we estimate *abnormal forecast revisions* (AFR) in month t for each firm as the difference between the actual forecast revision and the expected forecast revision:

$$\mathrm{AFR}_{i,t} = \mathrm{FR}_{i,t} - E\left[\mathrm{FR}_{i,t}\right]. \tag{4}$$

Finally, we compute the *t*-statistic for the difference between zero and the mean AFR for each 500-firm portfolio.

As with the raw forecast revisions, if abnormal forecast revisions are unbiased then the mean abnormal forecast revision for the randomly selected non-event dates should be zero. The grand mean (median) AFR across all 1000 portfolios is −0.0005 (−0.00004), while the mean (median) *t*-statistic is 0.16 (0.03). The maximum (minimum) portfolio mean value of AFR is 0.062

[6] Our requirement of 60 months of data ensures we have 47 months of data with which to estimate these parameters.

[7] Again, not all 500 firms have data on the randomly chosen non-event date. Because of this, and because of the added requirement for lagged FR, the average 500-firm portfolio now has 346 companies. The maximum (minimum) number of firms in a 500-firm portfolio is 439 (296).

Table 1
Ordinary least squares regression of non-event month forecast revisions.

Intercept	−0.002***	−0.002***	−0.002***	−0.002***
	(−26.15)	(−25.81)	(−25.59)	(−25.44)
FR_{t-1}	0.108***	0.107***	0.107***	0.107***
	(35.22)	(34.63)	(34.61)	(34.60)
FR_{t-2}		0.012***	0.011***	0.011***
		(3.76)	(3.58)	(3.57)
FR_{t-3}			0.006**	0.006*
			(2.04)	(1.94)
FR_{t-4}				0.003
				(1.02)
F-value	1240***	627***	419***	315***
Adjusted R^2	0.0105	0.0106	0.0107	0.0107

The independent variable is the earnings forecast revisions ($FR_{i,t}$) for firm i in month t and are computed using the following equation: $FR_{i,t} = (F_{i,t} - F_{i,t-1})/P_i$ where $F_{i,t}$ equals the mean earnings forecast of firm i in month t as reported by IBES, and P_i equals the stock price in month t − 1. Month t is a randomly selected month and represents a "non-event" in the life of firm i. Independent variables are the lagged values of FR_i. The sample consists of all Japanese firms that have at least 60 months of earnings forecast data on the IBES database. (*t*-statistic).
*,**, and *** signify statistical significance at the 0.1, 0.05, and 0.01 levels, respectively.

(−0.093), while the maximum (minimum) *t*-statistic is 3.24 (−2.82). Fig. 3 is a histogram of the *t*-statistics for all 1000 portfolios and illustrates that the distribution has shifted to the right and is now centered near zero. More formally, the *t*-statistic for the mean AFR is significantly different from zero at the 0.10 level in only 105 of the 1000 portfolios, a ratio equal to 10.5%. Specifically, the mean AFR are significantly negative in 12 of the portfolios and significantly positive in 93 of the portfolios. The modified Brous (1992) methodology has eliminated the negative bias in the Japanese earnings forecast data.

Finally, we filter this sample of nonevent AFR for outliers by eliminating any AFR that falls more than five standard deviations from the mean AFR for its 500-firm portfolio.[8] The new grand mean (median) AFR across all 1000 portfolios is −0.00003 (+0.00003), while the mean (median) *t*-statistic is −0.154 (0.03). The range of values for AFR is much tighter now with a maximum (minimum) value of 0.0186 (−0.0225), while the maximum (minimum) *t*-statistic remains unchanged at 3.19 (−3.00). Fig. 4 is a histogram of the *t*-statistics for all 1000 portfolios after filtering for outlier AFR. With filtering, the *t*-statistic for the mean AFR is significantly different from zero at the 0.10 level in 96 of the 1000 portfolios, a ratio equal to 9.6%, while the mean AFR are significantly negative in 16 of the portfolios and significantly positive in 80 of the portfolios.

In conclusion, Japanese earnings forecast data are subject to optimism bias and serial correlation, indicating that these characteristics are neither a function of some peculiarity in the U.S. markets, nor are they limited to the forecasts of analysts covering American companies. Any study of Japanese earnings forecast revisions must account for these characteristics. In order to study the effects on earnings forecasts of announcements of SEOs by Japanese companies, which we turn to next, we simply follow the procedure developed above. Specifically, we use a third-order moving average process rather than Brous's fourth-order process, and we replace the random "non-event" date with the actual date of the SEO announcement.

3. Japanese seasoned equity offerings

3.1. Hypothesis development

Myers and Majluf (1984) develop a model of asymmetric information in which managers of firms requiring outside capital use their private information to help determine the specific form of new financing. For example, suppose a manager needing new capital expects surprisingly good financial performance for the foreseeable future. This private information is by definition not reflected in the current share price. According to the model, this manager will issue new debt in order to avoid issuing under-valued shares. Only when the manager holds unfavorable private information will he issue new equity. In this game theoretic model, market participants are fully aware of managerial incentives and discount the value of outstanding equity upon announcement of a SEO in anticipation of poor future performance. Hence, whether they intend to or not, managers signal the nature of their private information through their financing decisions.

Using U.S. data, researchers have documented empirical results that are consistent with the Myers and Majluf (1984) model. For example, Mikkelson and Partch (1986) find cumulative abnormal returns that average +8.20% in the pre-announcement period followed by two-day announcement period abnormal returns that average −3.30% (see also Asquith and Mullins (1986), and Masulis and Korwar (1986)).[9] This market reaction to SEO announcements implies a negative signal from managers and the receipt of and reaction to that negative signal by the market. Investigating a possible underlying cause of this negative market reaction, Brous (1992) examines revisions in cash flow expectations surrounding SEOs, and reports negative and significant abnormal earnings forecast revisions that average −10.2%. Apparently, earnings analysts of U.S. companies view SEO announcements as a signal to reduce their expectations for the announcing firm's future performance, which is consistent with the reaction of equity market participants.

[8] We calculate the standard deviation using only non-zero AFR.
[9] In an examination of stock for bond exchanges, Kitsabunnarat-Chatjuthamard, Lung, Nishikawa, and Rao (2010) find mean (median) abnormal stock returns of 2.02% (3.33%).

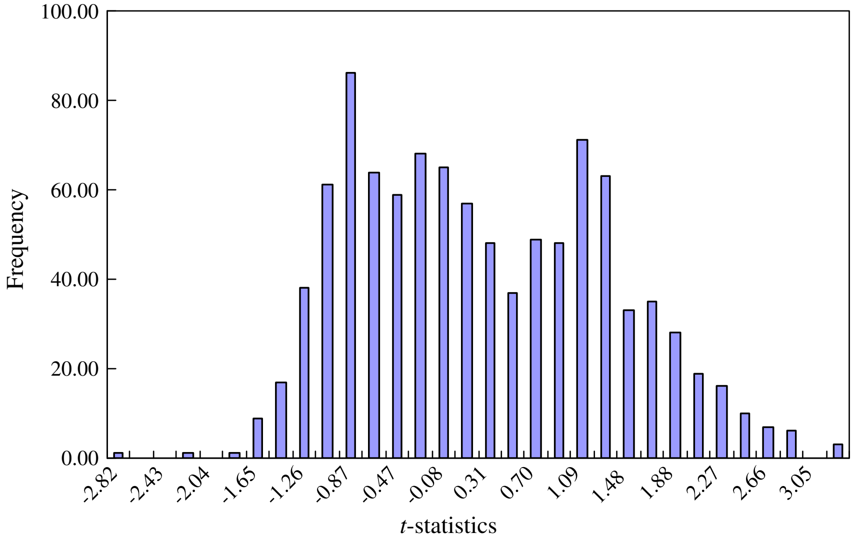

Fig. 3. Abnormal forecast revisions with outliers. This figure shows the empirical distribution of abnormal forecast revisions computed using the Brous (1992) method using a sample of Japanese companies contained in the IBES International database from which we form 1000 random 500-firm portfolios. This sample of forecast revisions contains outliers.

Authors have examined the market reaction to SEO announcements by Japanese firms. The reported results are inconsistent with the Myers and Majluf (1984) model and the related empirical studies using samples of U.S. companies. For example, using data over the period from 1985 through May 1991, Kang and Stulz (1996) report significantly positive average abnormal stock returns of about +0.5% at the announcements of SEOs by Japanese firms, and no run-up in prices prior to the offering. Upon further analysis, however, Kang and Stulz (1996) find that positive announcement period results are limited to announcements made during the growth of the Japanese stock market bubble in the 1980s, and to announcements made by the smaller companies in their sample. They conclude that the positive announcement period stock returns are not robust to changes in sample period, although they are reliably nonnegative throughout the entire sample period.

Cooney et al. (2003) extend the sample period backward in order to test the underwriter certification hypothesis of Booth and Smith (1986). Prior to 1991, the year in which Japan deregulated its security issuing process, underwriters used either the fixed-price or the formula-price method of issuing securities. Under the fixed-price process, underwriters were required to set and maintain the offering price for up to two weeks prior to the offering. This long period of price maintenance subjected underwriters to potential losses associated with changes in the market value of outstanding equity. According to Cooney et al. (2003), this price

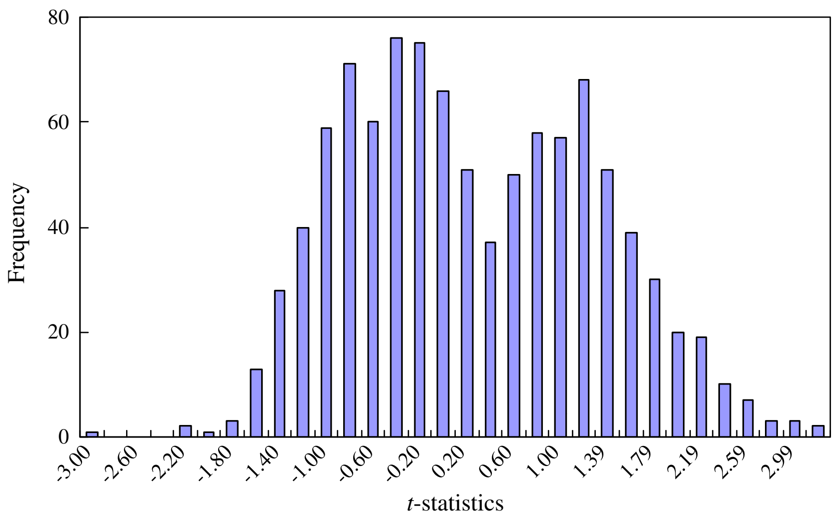

Fig. 4. Abnormal forecast revisions without outliers. This figure shows the empirical distribution of abnormal forecast revisions computed using the Brous (1992) method from a sample of Japanese companies contained in the IBES International database from which we form 1000 random 500-firm portfolios. Forecast revisions more than five standard deviations from the portfolio mean have been removed.

risk motivated underwriters to bring only the highest quality offerings to market, implying that an underwritten offering represented a virtual guarantee by the underwriter of the issuer's quality. The formula-price underwriting process, implemented near the midpoint of their sample period, provided less certification than the fixed-price process because the price was established closer to the issue date and was cancelable up to that date. Splitting their sample into offerings made under each of the two underwriting processes, Cooney et al. (2003) find that only offerings made under the fixed-price process are associated with positive abnormal returns suggesting that underwriter certification may be the key factor behind the "anomalous" positive stock returns for Japanese companies.

The Myers and Majluf (1984) model holds that the decision to make a SEO signals that the stock is overvalued at its current price. Accordingly, at the current price the market's estimate for either risk or future cash flows may be incorrect. Using the methodology developed in Section 2 above, we use abnormal revisions in earnings forecasts to examine whether future cash flow expectations change for a sample of Japanese firms that announce SEOs between 1993 and 2003. Our choice of sample period is important for two reasons. First, after deregulation of the Japanese underwriting process in 1991, Japanese underwriters discontinued use of both the fixed- and formula-price underwriting processes in favor of a book-building process similar to that used in the U.S. If the choice of underwriting process was the underlying cause of the positive average stock returns for Japanese issuers, as argued by Cooney et al. (2003), then a sample drawn after discontinuation of those underwriting processes should be free of such influence. Second, since our sample period begins after the bubble years of the Japanese stock market, our findings cannot be attributed to the associated run-up in prices as argued by Kang and Stulz (1996). Therefore, our more recent sample period should provide a set of Japanese firms that is more directly comparable to samples of U.S. companies.

Given the deregulated Japanese book building offering process, used over the entirety of our sample period, is similar to that used in the U.S., we have reason to expect results consistent with the theoretical model of Myers and Majluf (1984), and with Brous's (1992) findings. More formally, null hypothesis 1 states that announcements of SEOs by Japanese firms have no significant effect on the market's cash flow expectations for announcing firms. As mentioned above, Fried and Givoly (2002) and Arbanell et al. (1995) relate earnings forecasts to stock returns and expected returns, respectively. Consequently, we use revisions in analysts' earnings forecasts to proxy changes in cash flow expectations, and expect earnings forecast revisions to be positively related to announcement period stock returns. In its null form, hypothesis 2 states that there is no significant relation between abnormal earnings forecast revisions and abnormal stock returns.

3.2. Sample selection

We obtain our initial sample of 1935 Japanese companies making announcements of SEOs over the period from January 1993 through December 2003 from the *Securities Data Corporation* (SDC) Platinum database. Day 0 is defined as the earlier of the announcement date or the filing date, both as reported by SDC. All announcing companies are listed on the *Tokyo Stock Exchange* (TSE). We collect earnings forecast data for sample companies from the IBES International database and stock returns from both the *Pacific-Basin Capital Markets* (PACAP) and Datastream databases. Therefore, we omit from our sample any company whose earnings forecasts and/or stock returns are not contained in these databases. Finally, we require at least 60 months of data surrounding the announcement of an equity offering, which ensures 47 months of data with which to estimate model parameters as outlined above. Our data requirements result in a final sample of 479 announcements made by 301 Japanese companies.

Panel A of Table 2 shows the distribution of seasoned equity announcements by year and by month. Note the large increase from just two announcements per year in 1993 and 1994 to 100 and 101 announcements in 1999 and 2000, after which time the numbers of announcements per year decline. This is indicative of the cyclical nature of new stock offerings in Japan and may also indicate a reluctance to offer new securities in the period immediately after deregulation of the Japanese underwriting process. Cooney et al. (2003) show similar cyclicality in Japanese SEOs during their sample period from 1974 through 1991, and indeed their sample contains just one observation in 1991. There does not appear to be any clustering of SEO announcements by month, although there are nearly four times as many announcements in November as in December. Panel B indicates that there is very little industry clustering of seasoned equity announcements. Of the ten industries listed, the electrical industry has the highest proportion at 16.3% of the total number of offerings, while the automobile industry has the lowest proportion with just 4.3% of the total. Panel C provides descriptive statistics of the offerings themselves. The mean (median) number of shares offered is about 18 million (15 million) with a mean (median) market value of about ¥12 billion (¥38.5 million). The mean percentage increase in number of shares is 15.5%.

3.3. Results

In order to illustrate the effectiveness of our AFR methodology, we begin our empirical analysis with an examination of unadjusted earnings forecast revisions. Table 3 contains the average unadjusted forecast revisions for our sample companies over the eleven months surrounding the announcement. As noted above, these unadjusted revisions are likely to be subject to both an optimism bias and serial correlation. The optimism bias is evident in that the average unadjusted revisions are negative in ten of the eleven months, and significantly negative in nine of those ten. Interestingly, however, the single month in which the average unadjusted forecast revision is positive is the month immediately following the SEO announcement.

Table 4 presents the average AFR computed following the methodology outlined above. First, note that unlike the unadjusted forecast revisions, the average AFR are negative in just four of the eleven sample period months. Second, the average AFR are significantly different from zero in only one of the eleven sample months. Finally, and most importantly, the average AFR is

Table 2
Characteristics of a sample of Japanese seasoned common stock offerings.

Panel A. Annual and monthly distributions of seasoned common stock offerings

The sample includes 479 season equity offering announcements for 301 firms with data available in both the IBES International and PACAP databases. This sample does not include initial public offerings (IPO), or private placements.

Year	Number of offers included in sample	Percentage (%)	Month	Number of offers included in sample	Percentage (%)
1993	2	0.4	January	42	8.77
1994	2	0.4	February	58	12.11
1995	7	1.46	March	40	8.33
1996	31	6.47	April	22	4.59
1997	26	5.43	May	37	7.72
1998	39	8.14	June	24	5.01
1999	100	20.88	July	47	9.81
2000	101	21.09	August	53	11.06
2001	53	11.06	September	44	9.19
2002	58	12.11	October	31	6.47
2003	60	12.53	November	64	13.36
			December	17	3.55
Total	479	100	Total	479	100

Panel B. Industry distribution of seasoned common stock offerings

The sample includes 301 firms that are both available in IBES International database and PACAP Database.

Industry	Number of firms in the sample	Percentage
Automobiles	13	4.32%
Banking	39	12.96%
Chemical	33	10.96%
Construction	23	7.64%
Electrical	49	16.28%
Financial	19	6.31%
Food & Household	30	9.97%
Machinery & Engineering	40	13.29%
Service	35	11.63%
Other	20	6.64%
Total	301	100.00%

Panel C. Descriptive statistics for seasoned common stock offerings

Summary statistics for a sample of 479 seasoned equity offerings by 301 firms with data available from both the IBES International and PACAP databases between 1993 and 2003.

Descriptive Measure	Mean	Median	Standard Deviation	Minimum	Maximum
Number of shares offered (thousands)	18,255	15,000	77,421	0.09	1,464,250
Market valueof share offered (millions)	¥12,058.1	¥38.5	¥4891.4	¥342.0	¥7,138,804.5
Proportion of shares offered/shares previously outstanding	0.1546	0.1098	0.1792	0.00002	2

Table 3
Average monthly, unadjusted earnings forecast.

Relative month	Average monthly revision in the mean of analysts' forecast	*t*-statistic	Standard deviation
−5	−0.00852	−2.41***	0.08828
−4	−0.00322	−2.25***	0.03595
−3	−0.00685	−3.79***	0.04565
−2	−0.00716	−2.7***	0.06793
−1	−0.00456	−2.35***	0.05079
0	−0.00539	−1.96**	0.07361
1	0.00580	1.37	0.1115
2	−0.00624	−2.06**	0.07965
3	−0.00164	−0.94	0.04541
4	−0.00208	−2.29**	0.02339
5	−0.00125	−1.76*	0.01811

This table contains the mean monthly revision in the mean earnings forecast, which is calculated by dividing the difference between the forecasts from one month to the next by the firm's stock price per share in the prior month. The sample consists of all Japanese firms announcing seasoned equity offerings for which earnings forecasts are available from IBES International from 1993 to 2003. The announcement month is month 0.
*,**, and *** signify statistical significance at the 0.1, 0.05, and 0.01 levels, respectively.

Table 4
Average monthly and cumulative abnormal earnings forecast revisions.

Panel A			
Forecast month	Average abnormal forecast revision	*t*-statistic	Standard deviation
−5	−0.0058	−1.00	0.1144
−4	0.0020	0.82	0.0495
−3	−0.0005	−0.18	0.0606
−2	−0.0002	−0.07	0.0636
−1	0.0012	0.33	0.072
0	0.0008	0.21	0.0762
1	0.0140	2.1**	0.1388
2	−0.0052	−0.98	0.1117
3	0.0009	0.29	0.0643
4	0.0000	0.01	0.0386
5	0.0014	0.9	0.031

Panel B			
Window	Cumulative abnormal forecast revision	t-statistic	Standard deviation
(0, +1)	0.0145	1.91**	0.1572

This table contains the monthly average abnormal forecast revisions, which are calculated using a modified Brous (1992) method. The null hypotheses each month and for the cumulative abnormal forecast revision is that the average abnormal earnings forecast revision equals zero. The sample consists of all Japanese firms announcing seasoned equity offerings for which earnings forecasts are available from IBES International from 1993 to 2003. The announcement month is month 0. *,**, and *** signify statistical significance at the 0.1, 0.05, and 0.01 levels, respectively.

positive and statistically significant only in the month immediately after the announcement month. Since we do not know the temporal relation between the seasoned equity announcement date and the date on which each analyst's updated earnings forecast is reported to IBES, we cumulate the AFR over months 0 and +1 in order to capture the full effect of the announcement on the earnings forecasts of those analysts reacting to the announcement. The two-month *cumulative abnormal forecast revision* (CAFR), reported at the bottom of Table 4 is positive and statistically significant at the 0.05 level. These statistics contrast sharply with those reported by Brous (1992) who finds a statistically and economically significant negative average earnings forecast revision of −10.2% using U.S. data. In order to get an idea of the economic significance of the CAFR for our sample of Japanese firms, and to compare our findings to those of Brous (1992), we assume the average *price-to-earnings ratio* (PE) is 15. Algebraically, when we multiply the mean CAFR by the mean PE the price drops out of the equation leaving the percentage change in the mean earnings forecast. For our sample, the product of CAFR and PE indicates the average two-month earnings forecast is revised upward an economically significant 21.75% ($=0.0145 \times 15 \times 100\%$); twice that found by Brous (1992).

Fig. 5 illustrates the findings reported in Table 4 by plotting the average monthly AFR accumulated from month −6 over the entire thirteen-month sample window. Note the dramatic rise in month +1, and, following a retraction in month +2, the apparent maintenance of the higher level through month +6.

Previous studies of Japanese SEOs focused on short-term announcement effects, which we now analyze for comparison purposes. Following Kang and Stulz (1996) and Cooney et al. (2003), we use the Scholes and Williams (1977) methodology to

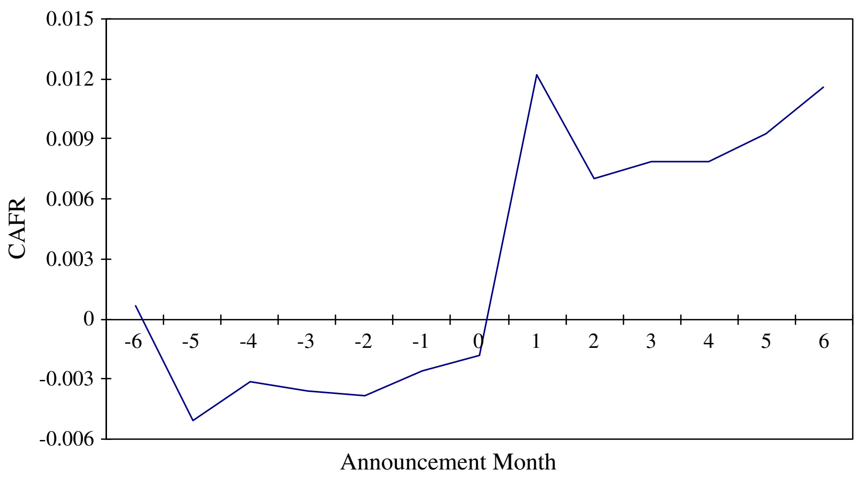

Fig. 5. Cumulative abnormal forecast revisions. This figure shows the mean cumulative abnormal forecast revisions by announcement month computed using the modified Brous (1992) method for a sample of Japanese companies announcing seasoned equity offerings for which data is contained in the IBES International database. The CAFR are cumulated beginning in month −6 through month +6.

Table 5
Average daily and cumulative abnormal stock returns.

Day	CAR	*t*-statistic	Standard deviation
Panel A			
−5	0.02%	0.13	0.0349
−4	0.33%	2.10**	0.0311
−3	−0.06%	−0.35	0.0348
−2	0.39%	2.26***	0.034
−1	0.51%	2.33***	0.0426
0	0.23%	1.02	0.0437
1	−0.04%	−0.11	0.0703
2	0.23%	0.93	0.0481
3	−0.16%	−0.98	0.0327
4	−0.18%	−1.15	0.0317
5	−0.08%	−0.52	0.031
Panel B			
(−30, −3)	0.71%	0.64	0.2215
(−2, +1)	1.06%	2.09**	0.1007
(−1, +1)	0.68%	1.42	0.0949
(+2, +30)	−2.37%	−1.41	0.3583

Mean abnormal returns and cumulative abnormal returns around announcements of seasoned equity offerings over the period 1993 to 2003 are reported. Abnormal returns are calculated using the Scholes and Williams (1977) methodology, and are the difference between the return on the announcing firm's share price and the return on a control portfolio assigned to the firm. Day 0 is the official seasoned equity offering announcement day.
*,**, and *** signify statistical significance at the 0.1, 0.05, and 0.01 levels, respectively.

calculate expected returns.[10] Excluding sample companies, we calculate the Scholes–Williams beta each year from 1993 through 2003 for all companies listed on the TSE, rank the companies each year in order of their betas, form ten portfolios each year based on the beta rankings, and calculate the average daily return for each of the ten portfolios. Next, we estimate sample company betas using data over the period from day −220 to day −30, relative to the SEO announcement date, and assign each company to one of the ten portfolios based on its estimated beta. Finally, we calculate abnormal returns by subtracting the respective portfolio return from the sample company return on each respective day in the announcement period.

Table 5 contains the average single-day abnormal returns and the average *cumulative abnormal returns* (CAR) over various cumulation periods for our sample companies. First note the significant positive returns on days −4, −2 and −1. For their sample, Cooney et al. (2003) collect multiple dates including the official announcement date, which is when the board of directors formally announce the decision to issue equity, and the managerial announcement date, which is the date the manager announces publicly the firm's intention to make a common stock offering. These two dates are frequently not the same. Cooney et al. (2003) report that the mean managerial announcement date for their sample occurs 3.6 days before the official board announcement date indicating information leakage prior to the official announcement date. Our empirical results on days −4 and −2 show a pattern of returns consistent with the information leakage found by Cooney et al. (2003).

We examine mean CAR over two announcement period windows. First, we use the conventional three-day window from day −1 to day +1 in order to conform to the window used by Kang and Stulz (1996) and Cooney et al. (2003). However, because of the obvious information leakage in day −2 we extend the traditional window back one day in order to include the effect of the leaked information on that day. The average three-day CAR centered on the official announcement date is +0.68% and has a *t*-statistic of 1.42, which is below conventional levels of statistical significance. The average four-day CAR, however, is 1.06% and is significantly positive at the 0.05 level. Both the three-day and four-day average CAR are consistent in magnitude with those reported by Kang and Stulz (1996) and Cooney et al. (2003), who report average announcement period CAR of 0.45% and 0.63%, respectively. In terms of significance levels, our results using a three-day CAR are more consistent with Kang and Stulz (1996) whose three-day CAR is marginally positive. The Cooney et al. (2003) three-day CAR has a *t*-statistic greater than 4 and is more consistent with our four-day CAR.

If cash flow expectations drive valuation and earnings forecasts help form such expectations, as argued by Fried and Givoly (2002) and Arbanell et al. (1995), then we should find that expected cash flow improvements lead to higher stock returns.[11] We use ordinary least squares regression to formally test the relation between abnormal forecast revisions and abnormal stock returns using the following equation:

$$CAR_i = \alpha_i + \beta_{1,i}CAFR_i + \beta_{2,i}PRECAR_i + \beta_{3,i}SIZE_i + \beta_{4,i}LEV_i \quad (5)$$

where the dependent variable is the announcement period cumulative abnormal stock return of firm i cumulated over one of the two announcement windows. The independent variable of primary interest is $CAFR_i$, the two-month cumulative abnormal forecast revision for firm i. The variable $PRECAR_i$ is the cumulative abnormal stock return for firm i over the period from days −30 to −3 or days −30 to −2, depending on the cumulation period of the dependent variable, and is included in the regression to control for

[10] The stock of some Japanese companies listed on the Tokyo Stock Exchange is traded infrequently. The Scholes and Williams (1977) beta estimation methodology produces consistent estimates in the presence of non-trading.
[11] It is important to note that we do not claim that all Japanese firms will see higher earnings expectations, just that earnings expectations will be positively related to stock returns.

Table 6
Regression results.

Estimated coefficients (t-statistic)				
Independent variables	CAR(−2,+1)		CAR(−1,+1)	
Constant	0.140***	0.125***	0.136**	0.129**
	(3.81)	(2.66)	(3.10)	(2.18)
CAFR(0,+1)	0.146***	0.147***	0.106***	0.117***
	(4.68)	(4.22)	(3.25)	(3.12)
PRECAR(−30,−3)	0.008	0.023		
	(0.29)	(0.77)		
PRECAR(−30,−2)			0.017	−0.090
			(0.13)	(0.58)
SIZE	−0.012***	−0.012***	−0.011***	−0.012**
	(−3.66)	(−3.13)	(−2.90)	(−2.46)
LEV		0.035		0.029
		(1.63)		(1.14)
F-value	15.03***	10.96***	7.73***	5.69***
Adjusted R^2	0.104	0.122	0.073	0.087

The dependent variable is the announcement-window abnormal stock return. The independent variables are two-month cumulative abnormal forecast revisions (CAFR), pre-announcement cumulative abnormal returns (PRECAR), the natural logarithm of the firm's market value (SIZE), and the ratio of total liabilities to total assets (LEV).
*,**, and *** signify statistical significance at the 0.1, 0.05, and 0.01 levels, respectively.

information leakage prior to the announcement. The variable $SIZE_i$ is the natural logarithm of the market capitalization of firm i, and is designed to account for potential firm-size effects as reported by Kang and Stulz (1996). Finally, the variable LEV_i is the ratio of total liabilities to total assets for firm i, and is included to control for possible capital structure effects related to the issuance of new equity.

Table 6 contains the results of estimating equation 5. The first two columns provide estimated coefficients for regression models over the four-day announcement period window from day −2 to day +1, while the last two columns provide estimates using the conventional three-day window from day −1 to day +1. The regression results are nearly identical whichever announcement period window we use to cumulate returns. The main finding is that the announcement period CAR is significantly and positively related to the CAFR across all regression models with adjusted-R^2 values around 0.10. Apparently, there is a strong positive relation for Japanese firms between abnormal changes in cash flow expectations and abnormal stock prices. As for the control variables, we do not find a significant association between the announcement period abnormal stock returns and the preannouncement CAR for either the three- or four-day windows. The control variable for company size is significantly negatively associated with the announcement period CAR for both windows. This finding is consistent with Kang and Stulz (1996) who report that positive announcement period returns are limited to the smaller firms in their sample, and inconsistent with Cooney et al. (2003) who find no difference between the returns for large and small firms when the offering method, fixed-price or formula-price, is accounted for. Since our sample period begins in 1993, our results regarding firm size are not influenced by the offering method. Finally, company leverage is positively related to the announcement period CAR, but at a level just below that of statistical significance. The estimated coefficient implies that firms with higher leverage tend to be rewarded with higher abnormal stock returns when announcing intentions to reduce leverage by issuing new common stock.

4. Conclusion

Using the bootstrap method, we examine the characteristics of revisions in Japanese earnings forecast data, compare and contrast those with analogous characteristics of U.S. data, use the results to develop an empirical method to estimate abnormal earnings forecast revisions, and then illustrate use of the methodology by analyzing forecast revisions subsequent to announcements of SEOs by Japanese companies. We find that Japanese earnings forecast data are quite similar to the analogous U.S. data in that initial forecasts tend to contain an optimism bias and exhibit serial correlation. A modified version of the Brous (1992) method using three lag terms eliminates these biases in the data. Our analysis of a sample of Japanese SEOs illustrates how well this methodology works in eliminating the bias. Unadjusted forecast revisions around the SEO that appear negative and highly significant in their raw form are insignificant after applying the methodology, except for the event month immediately subsequent to the announcement for which the mean abnormal forecast revision is positive and significant. Regression results show a strong link between abnormal forecast revisions and announcement period abnormal stock returns, after controlling for pre-announcement period returns, firm size, and leverage. These results are inconsistent with the Myers and Majluf (1984) asymmetric information model, and are inconsistent with previous explanations of the positive announcement effect as being a result of either the bubble in Japanese asset prices or idiosyncrasies in the structure of the Japanese offering process.

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