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Does reputation matter? Evidence from share repurchases☆

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ABSTRACT

This paper examines whether the stock market considers the firm's reputation established through a history of management earnings forecasting when it evaluates open market repurchase announcements. We refer to this established reputation as the firm's "forecast reputation". We find that while the stock market considers the firm's "repurchase reputation" (proxied by prior repurchase completion rates), it also considers the firm's forecast reputation established from the accuracy of prior management earnings forecasting, suggesting a spillover effect of forecast reputation. Further, interaction test between the two reputation variables reveals that the market reacts more to the firm's forecast reputation when its repurchase reputation is low. Additional analyses suggest that when a firm announces a share repurchase program for the first time (i.e., when there is no repurchase reputation), investors turn to the forecast reputation within the firm as an alternative source of reputation, on which the credibility of repurchase announcements is assessed. Overall, our study provides evidence that firms establish a reputation in the market through multiple sources of announcements.

1. Introduction

Firms establish a reputation through their past behaviors. This reputation could influence how the stock market perceives the credibility of subsequent announcements made by firms. While firms have been shown to establish a reputation through their prior earnings forecasting behavior (Hutton and Stocken (2009)), they have also been shown to establish a reputation with respect to repurchase completion (Bonaimé (2012)). Specifically, Hutton and Stocken (2009) document that the stock price response to management forecasts of earnings news increases in prior forecast accuracy and in the length of the forecasting record. Bonaimé (2012), on the other hand, finds that prior repurchase completion rates are positively correlated with current completion rates and announcement returns. Although the stock market may consider prior repurchase completion rates when evaluating a firm's subsequent repurchase announcements, it is plausible to assume that the stock market may also consider the firm's already established reputation through earnings forecasts issued by its management, since such practice typically occurs more frequently and has a longer history than repurchases. Given the circumstances under which different reputations are developed, we refer to the reputation with respect to prior earnings forecast accuracy as "forecast reputation" and prior repurchase completion rates as "repurchase reputation".

This paper asks whether the forecast reputation has a spillover effect on how the stock market reacts to new repurchase

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announcements given the repurchase reputation within the firm. Besides, not all firms engage in share repurchases. This means that not all firms have prior repurchase completion rates (i.e., not all firms would have a repurchase reputation), which the stock market could consider when evaluating the firms' new repurchase announcements. Our paper addresses this issue by investigating whether the stock market would consider a firm's forecast reputation when the firm is conducting a share repurchase for the first time.

We answer the above research question using the Japanese setting. This setting has a number of advantages for examining the economic consequences of share repurchases compared to the US. First, Japanese firms are required to announce the results of the repurchase program, which allows for a more accurate calculation of the repurchase completion rates.[1] Second, there is currently no regulation in the US requiring firms to complete the share repurchase program within a certain time period, whereas firms in Japan are required to complete a share repurchase program within a year. The shorter planned repurchase period in Japan implies that repurchase completion rates are less susceptible to noise induced by exogenous shocks (such as fluctuations pertaining to interest rates, currency rates, commodity prices, etc.).[2] This in turn means that the completion rates of Japanese firms tend to be more stable and better reflect the original intention of managers of firms undertaking share repurchases than the US. Accordingly, we argue that repurchase completion rates calculated using the Japanese setting are a better proxy for repurchase reputation. Third, Japanese firms have been required to provide initial management earnings forecasts at the beginning of the fiscal year for a long period.[3] This long tradition of forecasting leads us to believe that Japanese firms would already have a well-established reputation with respect to earnings forecasts. It is therefore interesting to examine whether this forecast reputation has an incremental effect on how the stock market evaluates the firm's subsequent repurchase announcements, conditional on the firm's repurchase reputation.

While there are some distinct features between the US and Japan with respect to share repurchases, we also highlight a few similarities that may overcome external validity concerns arising from our single-country study. Like the US, open market share repurchases (OMRs) are the most common method of repurchases in Japan, and prior studies document that the primary reason for why Japanese firms undertake OMRs is consistent with the undervaluation hypothesis (Vermaelen (2005); Ota and Kawase (2016)). Further, the distributions of repurchase completion rates and announcement returns are comparable between the US and Japan. Namely, the average completion rates are between 73% and 79% in the US (Stephens and Weisbach (1998); Bonaimé (2012, 2015)), while we find in this study that the average completion rate in Japan is 77%. The market reactions to the announcements of OMRs are around 2–3% in both jurisdictions.

Among the various methods of share repurchases, OMR is the only method by which firms are not committed to buy back the number of shares that are officially announced, giving them considerable flexibility over the amount of shares to be repurchased. Therefore, it is not uncommon to observe firms' actual repurchases often deviate substantially from the announced amount (Stephens and Weisbach (1998); Bonaimé (2012, 2015)). In fact, OMRs could lead to low repurchase completion rates. For instance, Stephens and Weisbach (1998) find that while 60% of firms have a completion rate of 100%, 10% of firms have a completion rate of less than 5%. Their results suggest that OMR announcements could be used to inflate the share prices by firms without the real intention to actually follow through on the repurchases (Fried (2001, 2005)). Nevertheless, if the firm has consistently low repurchase completion rates, the market might perceive subsequent repurchase announcements made by the firm to be less credible, thereby resulting in reputational loss.

We adapt a model based on Bonaimé (2012) to test our research question. We show that current repurchase rates are positively associated with both forecast and repurchase reputations in all of our various model specifications, suggesting that firms with a record of more accurate earnings forecasting and higher prior repurchase completion rates are more likely to complete the current repurchase programs. We also find that investors incorporate the firm's prior earnings forecast accuracy and prior repurchase completion rate into their reactions to OMR announcements, providing evidence of forecast and repurchase reputational effects on the market's assessment of the credibility of OMR announcements. Analysis of the interaction effect between the two reputation variables further reveals that the stock market responds more to the firm's forecast reputation when its repurchase reputation is low. Taken together, our findings indicate that a firm's forecast reputation has a spillover effect on the stock market reaction to the firm's current repurchase announcement, given its repurchase reputation.

We perform additional analyses to investigate whether the stock market turns to other sources of reputation within the firm to evaluate the credibility of the OMR announcements, when a firm announces a share repurchase program for the first time (i.e., when there is no repurchase reputation). Using a subset of firms that have undertaken OMRs for the first time, we find that the stock market does indeed turn to the forecast reputation of the firm in the absence of prior repurchase completion rates.

Our study contributes to the literature on the effect of firms' reputation on stock market reaction to new corporate announcements. While prior studies find that firms can establish a reputation from an event-specific announcement, the question of whether firms can establish a reputation through other sources of announcements has so far been ignored. Our study fills this gap in the literature by providing evidence that firms can establish a reputation through multiple sources of announcements. Further, our study improves our understanding about the dynamics of a firm's reputation and how the stock market utilizes the reputation to evaluate the credibility of the firm's subsequent announcements.

[1] Banyi et al. (2008) report a significantly large estimation error in the repurchase completion rates in the US before the Rule 10b-18 of the Securities Exchange Act of 1934 was revised in December 2003. Similar to our study, Ikenberry et al. (2000) and Andriosopoulos et al. (2013) overcome the inaccuracy of repurchase completions rates in the US studies by using accurate monthly/daily share repurchase data in Canada and the UK, respectively. Note that as the US firms are required to provide quarterly updates on actual repurchases since 2004, this specific advantage of the Japanese context is relative to early work in the US.

[2] To illustrate further, variations in these macroeconomic factors may have both direct and indirect impact on the firm's cash flows, which may ultimately affect the firm's ability to complete its repurchase program.

[3] Japanese firms have complied with this requirement since late 1970s (Kato et al. (2009); Ota (2010)).

The structure of this paper is organized as follows. The next section provides a discussion of the institutional background and related literature, and Section 3 specifies the research design and variables. Section 4 describes our sample and presents descriptive statistics. Section 5 provides completion rate analysis, while Section 6 provides market reaction analysis. Section 7 presents the results of the additional analysis. Finally, we offer a summary and conclusion in Section 8.

2. Institutional background and related literature

2.1. Share repurchase in Japan

Prior to 1994, the Commercial Law prohibited the use of share repurchases and dividend payments were the only form of corporate payout in Japan. Although the Commercial Law was amended to allow firms to repurchase shares in 1994, share repurchases had only increased in popularity after 1995. This is because according to Japanese accounting rules, share repurchases would have an effect of increasing the per share capital of the remaining outstanding shares, which would attract a 'presumed' dividend tax (Zhang (2002)). Consequently, the dividend tax had dissuaded Japanese firms from buying back their own shares. This tax rule was removed in 1995, a change that spurred share repurchases in Japan.

The Company Act (the Act) in Japan governs share repurchase practices of Japanese public firms. The Act outlines four platforms on which shares can be repurchased:

(i) On-market trading (Article 165, Para. 1 of the Act);
(ii) Off-market self-tender offer (Article 165, Para. 1 of the Act);
(iii) An offer to transfer to all shareholders (Article 158, Para. 1 of the Act); and
(iv) Negotiated transactions with selected shareholders (Articles 160–164 of the Act).

Listed firms in Japan generally choose platforms (i) and (ii) to repurchase shares. In this paper, our focus is on share repurchases through on-market trading (i.e., platform (i)). On-market trading can be conducted either during auction or off-auction hours. On-market trading during auction hours occurs in the morning session (9:00–11:30 a.m.) and the afternoon session (12:30–3:00 p.m.) in an open market, and is widely known as an OMR throughout the world. On the other hand, on-market trading during off-auction hours takes place before the morning session starts (8:20–8:45 a.m.) through the Tokyo Stock Exchange Trading Network (ToSTNeT).[4]

Fig. 1 presents the implementation schedule of an OMR. An OMR in Japan is generally executed as follows. The firm typically announces the repurchase program on day $t - 1$ at 3:30 pm following the close of the afternoon trading session at 3:00 pm. This announcement includes the intended size of the repurchase plan as a dollar value and the number of shares to be repurchased, and the length of repurchase period (less than one year). Next, the firm makes the actual repurchase, which generally occurs around 60 days after the announcement. In contrast to the US, where the actual repurchase generally occurs over several years after the announcement of the repurchase program, the timeframe between the announcement and the completion of the repurchase program is shorter in Japan. Finally, the results of the repurchase program (including the number of shares repurchased and the amount of money spent) are announced.

2.2. Related literature

There is abundance of evidence that shows the credibility of management forecasts is correlated with prior forecasting behaviors, suggesting the importance of reputational effect. Hutton and Stocken (2009), for instance, document that the stock price response to a firm's current management forecast is positively associated with the firm's prior forecast accuracy and also the length of the firm's forecasting record (i.e., the number of forecasts a firm has previously issued). Yang (2012) studies manager-specific forecasting behavior instead of the usual firm-specific forecasting behavior and finds that the market reaction to management forecasts is stronger when the manager has a history of issuing more accurate forecasts. Ng et al. (2013) also provide evidence that the credibility of management forecasts (measured by prior forecast accuracy, among other proxies) influences how the market reacts to management forecast news at the time of its release and thereafter. Specifically, they find that more credible management forecasts are associated with a larger price reaction in the short window and a smaller post-management forecast drift in returns. Their findings suggest that firms can mitigate the credibility concerns created by the uncertain and non-audited nature of management forecasts, by continually providing the market with accurate forecasts thereby establishing a good reputation among investors.

The credibility of management forecasts can also influence analysts' forecasting behaviors (Hassell et al. (1988); Baginski and Hassell (1990); Williams (1996); Ota (2007); Nara and Noma (2013)). For instance, Hassell et al. (1988) find that management forecasts provide firm-specific information that is useful to analysts in producing less biased and more accurate earnings forecasts. Williams (1996) extends this study by proposing that prior management forecast usefulness to be measured by relative forecast accuracy (i.e., the accuracy of management earnings forecasts relative to the accuracy of analyst earnings forecasts). The intuition behind the measure of relative forecast accuracy is that if the accuracy of management earnings forecasts is higher than that of analyst earnings forecasts, then management earnings forecasts are considered to be useful to analysts. Using the measure of relative

[4] ToSTNeT is a unique form of repurchase in Japan and is a kind of privately negotiated share repurchase between the repurchasing firm and the individual shareholder.

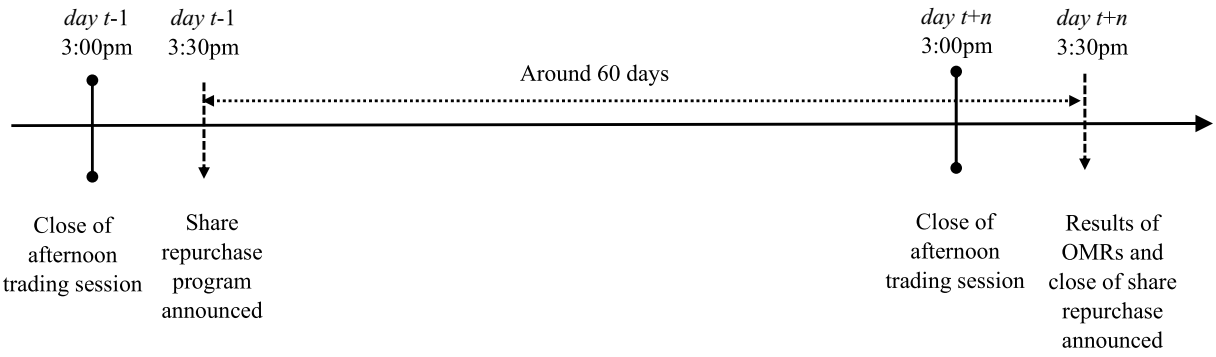


Fig. 1. Implementation schedule of OMR.

forecast accuracy, she documents that analysts have a tendency to modify their earnings forecasts for firms that provide more useful prior management earnings forecasts, after controlling for other determinants of believability. In a related study, Hirst, Koonce, and Miller (1999) conduct an experimental study using MBA students with four years of work experience on average as subjects. They find that the prior accuracy of management forecasts and the form of the forecasts (i.e., point or range forecasts) jointly influence the participants' judgements on purchasing shares. Overall, the findings of these studies suggest that management acquires a forecasting reputation among analysts as well as in the market.

The extant literature also shows that a firm can develop a reputation from other sources. Bonaimé (2012) focuses on the discretion that management has over how many shares are to be bought back in an announced repurchase program. She proposes that a firm develops a reputation from its prior repurchase completion rates (i.e., the ratio of actual to announced repurchases), and finds that the stock market reaction to new repurchase announcements made by less reputable firms is smaller. Specifically, she finds a 1-standard-deviation increase in the lagged completion rate follows a 36-basis-point increase in five-day market-adjusted returns around the announcement of the next repurchase. She also ascertains that firms are more likely to announce accelerated share repurchases (ASRs) when the firms are concerned about their reputation in the stock market (i.e., low prior repurchase completion rates).[5] Bargeron et al. (2011) document firms use ASRs to strengthen the reliability of the repurchase announcements when such announcements do not appear to have an initial impact on the stock market.

Based on our review of the literature, a question that is raised is whether the stock market considers a firm's already established reputation through prior management earnings forecasting, when it evaluates the firm's new repurchase announcement. Specifically, these firms that regularly provide management earnings forecasts would have established a “forecast reputation” in their communications with the stock market. If the firm has a strong (weak) record of accurate forecasting, then the stock market might perceive any announcements made by the firm to be more (less) credible and would react more (less) favorably to the news.

Further, not all firms have prior repurchase completion rates. That is, not all firms have a repurchase reputation on which the stock market can assess the credibility of repurchase announcements made by firms. As such, it would be interesting to investigate how the stock market evaluates a new repurchase announcement made by a firm that does not have a record of share repurchases. In this case, the stock market might consider the firm's forecast reputation in order to evaluate the credibility of the firm's new repurchase announcement. That is, the forecast reputation has a spillover effect on how the stock market perceives the credibility of the firm's new repurchase announcement.

3. Model development

We use initial management earnings forecasts to measure the forecast reputation of firms because Japanese firms have been required to provide such forecasts at the beginning of the fiscal year for an extensive period of time. Therefore, we presume that firms establish a forecast reputation in the market through earnings forecasting. Specifically, announcements made by firms with a history of issuing more (less) accurate earnings forecasts would be perceived by the stock market to be more (less) credible, which would have a spillover effect on other announcements that the firms might make, such as repurchase announcements. We construct forecast reputation variable (*Reputation*) based on the absolute value of management earnings forecast error, adjusted by industry median management earnings forecast accuracy, over the previous three years. To convert the variable into one that is increasing in accuracy, we multiply the industry-adjusted management forecast accuracy by -1. Accordingly, *Reputation* can be expressed as:

$$Reputation_{iyj} = \frac{1}{3}\sum_{y=-1}^{-3}\left(\frac{|MFNI_{iy} - ActualNI_{iy}|}{Market\ Value\ of\ Equity_{iy}} - Industry\text{-}Median\ MFNI\ Accuracy_{iy}\right)\times(-1)$$

where, management earnings forecast accuracy is the absolute difference between management forecast of net income (*MFNI*) and

[5] While ASRs are not as flexible as OMRs, ASRs are considered to be more reliable than OMRs because firms using ASRs are required to repurchase the shares contracted with the investment banks.

realized net income (*ActualNI*), deflated by the market value of equity at the beginning of the year.[6]

We adapt a model based upon Bonaimé (2012), to test the effect of forecast reputation on current completion rates and the stock market response. Eq. (1) is estimated following the Tobit procedure, while for Eq. (2), we use pooled ordinary least square regressions. The standard errors are estimated using the two-way cluster-robust method based on firm and year to ensure results are robust to both cross-sectional and time-series dependence in the residuals (Petersen (2009)).

$$\begin{aligned} CompRate_{iyj} &= \alpha_0 + \alpha_1 Reputation_{iyj} + \alpha_2 LagCompRate_{iyj} + \alpha_3 PlanSize_{iyj} + \alpha_4 LnPlanDays_{iyj} \\ &\quad + \alpha_5 LagReturn_{iyj} + \alpha_6 EmergeMkt_{iyj} + \alpha_7 LnMVE_{iyj} + \alpha_8 BMR_{iyj} + \alpha_9 Cash_{iyj} + \alpha_{10} CF_{iyj} \\ &\quad + \alpha_{11} Leverage_{iyj} + \alpha_{12} SDReturn_{iyj} + \alpha_{13} SDCF_{iyj} + \gamma Motive\ Dummies_{iyj} \\ &\quad + \delta Year\ Dummies_y + \varepsilon_{iyj}, \end{aligned} \tag{1}$$

$$\begin{aligned} CAR_{iyj} &= \beta_0 + \beta_1 Reputation_{iyj} + \beta_2 LagCompRate_{iyj} + \beta_3 PlanSize_{iyj} + \beta_4 LnPlanDays_{iyj} \\ &\quad + \beta_5 LagReturn_{iyj} + \beta_6 EmergeMkt_{iyj} + \beta_7 LnMVE_{iyj} + \beta_8 BMR_{iyj} + \beta_9 Cash_{iyj} + \beta_{10} CF_{iyj} \\ &\quad + \beta_{11} Leverage_{iyj} + \beta_{12} SDReturn_{iyj} + \beta_{13} SDCF_{iyj} + \gamma Motive\ Dummies_{iyj} \\ &\quad + \delta Year\ Dummies_y + \varepsilon_{iyj}, \end{aligned} \tag{2}$$

where,

CompRate: open market share repurchase completion rates, which is the ratio of the actual repurchases to the announced repurchase plan size;

CAR: 2-day market-adjusted abnormal returns over the event window $t = 0$ to 1[7];

Reputation: industry-median adjusted management earnings forecast accuracy of net income averaged over three years prior to year y multiplied by -1;

LagCompRate: the completion rate associated with the most recent prior repurchase announcement;

PlanSize: the planned size of the repurchase program, measured by the number of shares to be repurchased divided by the total number of shares outstanding (excluding treasury shares);

LnPlanDays: planned acquisition days, which is the natural logarithm of the planned repurchase period expressed in trading days;

LagReturn: cumulative abnormal returns from 30 days to 1 day before the announcement of the repurchase program;

EmergeMkt: a dummy variable that equals to 1 if the firm is listed on the Mothers section of the TSE;

LnMVE: the natural logarithm of the firm's market value of equity at the end of the month prior to the repurchase announcement;

BMR: the book-to-market ratio at the end of the most recent quarter prior to the repurchase announcement;

Cash: cash and short-term investments divided by the market capitalization at the end of the most recent quarter prior to the repurchase announcement;

CF: the trailing 12 months operating cash flow of the most recent second or fourth quarter prior to the repurchase announcement divided by market capitalization;

Leverage: total liabilities divided by total assets at the end of the most recent quarter prior to the repurchase announcement;

SDReturn: the standard deviation of stock returns for the 200-day period from 210 days to 11 days prior to the repurchase announcement;

SDCF: the standard deviation of semi-annual operating cash flows over the three years divided by the market capitalization at the end of the most recent quarter prior to the repurchase announcement;

Motive Dummies: dummy variables that equal to 1 for eight reasons of the share repurchase: (i) *Flexible capital policy*, (ii) *Capital efficiency*, (iii) *Shareholder value*, (iv) *Stock option*, (v) *Return to shareholders*, (vi) *Share exchange*, (vii) *Capital restructure*, (viii) *Others*; and[8,9]

[6] We have used an alternative deflator, namely, total assets, and the results remained qualitatively similar.

[7] The event day of the share repurchases on which announcements are made after the close of the market at 3:00 pm is defined as the next day of the announcement date. Therefore, we do not include the abnormal returns before the event day in the calculation of *CAR*. The results are qualitatively similar when the cumulative abnormal returns over the event window $t = 0$ to 2, $CAR_{(0,+2)}$, are used. To calculate abnormal returns, we estimate the standard market model over a 200-day period, $-230 \leq t \leq -31$, with $t = 0$ being defined as the repurchase announcement event day. We use different market indexes for the different sections of the TSE on which firms are listed: the TOPIX for the first section of the TSE, the TSE Second Section Stock Price Index for the second section of the TSE, and the TSE Mothers Index for the Mothers section of the TSE.

[8] To the best of our knowledge, there are no prior studies that investigate the stated motives of share repurchases in Japan and only two studies exist in the US, Peyer and Vermaelen (2009) and Bonaimé (2012). Peyer and Vermaelen (2009) read the motives in 3481 cases of share repurchases and report that 'Best use of money' (34.1%), 'Distribution of cash' (21.1%) and 'ESOP' (20.0%) are the three most cited reasons. They also find in a univariate analysis that while the average abnormal returns around the repurchase announcements are 2.3%, they increase to 3.70% and 2.87% when 'Undervalued' and 'Best use of money' are cited in the announcements, respectively. On the other hand, Bonaimé (2012) carries out a multivariate analysis and finds that the stated motives do not influence the completion rates and the market reacts significantly more positively only when 'Enhance shareholder value' is stated as the motive after controlling for other factors. Further, using a sample of 212 share repurchases in Australia, Akyol and Foo (2013) examine whether the market's reaction to repurchase announcements is different for the undervaluation motive compared with other motives. They find that the market reacts more positively to the announcements of undervaluation motive firms (4.29%) than other motive firms (2.67%).

[9] We read the reason-for-repurchase section of the share repurchase statements and classify it into eight categories. When multiple motives are mentioned in the statement, their respective dummy variables take the value of one.

Year Dummies: fiscal year dummy variables. The subscripts *i*, *y*, *j* indicate firm, fiscal year, and order in multiple share repurchases in the same fiscal year, respectively. Furthermore, all variables except dummy variables are winsorized at the top and bottom 1%.

Reputation and *LagCompRate* are the reputation variables. A firm's forecast reputation established through a record of accurate forecasting may imply that the firm would suffer losses in the forecast reputation if the firm does not follow through on its repurchase announcements. Based on this argument, we predict a positive coefficient on *Reputation* in Eq. (1). Bonaimé (2012) documents that prior repurchase completion rates are positively correlated with current completion rates, suggesting that repurchase completion rates have a persistent nature. We therefore predict a positive coefficient on *LagCompRate* in Eq. (1). With regard to Eq. (2), we predict a significantly positive coefficient on each of the two reputation variables, suggesting that new repurchase announcements made by firms with high forecast (*Reputation*) and repurchase (*LagCompRate*) reputations are perceived as more credible in the stock market.

With respect to the control variables in Eqs. (1) and (2), the planned repurchase size (*PlanSize*) and the planned repurchase period (*LnPlanDays*) relate to the repurchase limit. A firm's difficulty to acquire all of the shares is increasing in the planned repurchase size, leading to lower current repurchase completion rates. Therefore, we predict a negative sign on *PlanSize* in Eq. (1). We predict a positive sign on *PlanSize* in Eq. (2) because the stock market is likely to react more favorably to the firm's repurchase announcement, when the firm plans to repurchase more shares.

LnPlanDays is unique to Japan. There is no regulation in the US that requires firms to complete the share repurchase program within a certain time period, whereas Japanese firms are required to complete a share repurchase program within a year, and the timeframe for repurchasing shares always forms part of the announcement (Article 156, Para. 1 of the Act). A shorter time period may indicate that the firms are more willing to complete the repurchase program. Therefore, a negative sign is predicted on the coefficient of *LnPlanDays* for Eq. (1). We predict a negative sign on the coefficient of *LnPlanDays* in Eq. (2) because the investors might expect that there could be a higher demand in shares when planned acquisition days are shorter.

Consistent with the undervaluation hypothesis, we include *LagReturn*, *LnMVE*, and *BMR* in Eqs. (1) and (2), while *Cash* and *CF* are included to be consistent with the free cash flow hypothesis.[10] In line with the optimal capital structure hypothesis, we include *Leverage* to control for the motive of the firm to repurchase shares in order to inflate the firm's leverage until it reaches the level perceived by the firm to be suitable (Dittmar (2000); Bonaimé et al. (2014); Lei and Zhang (2016)). *SDReturn* and *SDCF* are included to be consistent with the flexibility hypothesis, where firms use their discretion over the number and timing of shares to buy back (Bargeron et al. (2011); Bonaimé et al. (2016)). Consistent with Bonaimé (2012), we include eight binary variables to capture firms' motives to repurchase shares.

4. Sample and descriptive statistics

4.1. Sampling

We source the fiscal, forecast, and share price data from Nikkei Financial QUEST. The data relating to share repurchases are obtained from the Financial Data Solutions (FDS) share repurchase database based on the following sample selection criteria:

(1) The resolution on matters relating to share repurchases is made between 1 September 2003 and 31 December 2017 (the analysis period is limited to ten years between 1 January 2008 and 31 December 2017);
(2) Firms that repurchase their own shares must be listed on the first, second, or Mothers (market for high-growth and emerging stocks) sections of the TSE; and
(3) Share repurchases for special reasons (Article 155, Para. 1, 2 and 4–13 of the Act), shares repurchases from certain shareholders (Articles 160–164 of the Act), and repurchases of unlisted preferred shares are removed.

Note in regard to (1) above, the coverage of the FDS share repurchase database begins in September 2003, at which time the Commercial Law was amended to allow firms to repurchase shares solely upon the approval of the board of directors.[11] However, due to insufficient availability of certain key items (e.g., repurchase motives, exact time of the announcement) in the early years of the coverage, we are unable to conduct analysis of the entire coverage period. Therefore, we use the 2003–2007 period solely for the purpose of obtaining the lagged repurchase completion rate, *LagCompRate*.[12]

The above criteria yield a sample of 5648 share repurchases (excluding observations from the 2003–2007 period that are used to calculate *LagCompRate* in the models). In order to provide more robust tests of the stock market reaction to repurchase

[10] The undervaluation hypothesis and the free cash flow hypothesis are probably the two most widely accepted explanations for share repurchase decisions of firms. The undervaluation hypothesis argues that a firm engages in share repurchases as a signal to the market that the stock is undervalued (Vermaelen (1981); Comment and Jarrell (1991); Ikenberry et al. (1995)), while the free cash flow hypothesis posits that share repurchases mitigate shareholder concerns about the misuse of excess funds (Jensen (1986); Grullon and Michaely (2004)). For detailed explanations of other various hypotheses related to the motives for share repurchase (e.g., the option-funding hypothesis, the takeover deterrence hypothesis, the mimicking hypothesis), see Grullon and Ikenberry (2000), Dittmar (2000), Kahle (2002), Allen and Michaely (2003), Chan et al. (2004), Billett and Xue (2007), and Massa et al. (2007).

[11] Prior to September 2003, share repurchases were required to be first approved at the GSM and later at the board of directors meeting when the share repurchases were implemented.

[12] This approach is important for keeping the sample size for the 2008–2017 analysis period.

announcements, we remove the following share repurchases from the sample: (i) share repurchases via off-market self-tender offers (134 observations); (ii) share repurchases through General Shareholders Meeting (GSM) resolutions based on Article 156, Para. 1 of the Act (36 observations); (iii) share repurchases via the ToSTNeT market (1597 observations); and (iv) share repurchases using both OMR and ToSTNeT repurchase (386 observations).

Table 1 describes the sample selection procedure for this study. Our initial sample consists of 5648 share repurchase announcements. OMR announcements account for more than 60% of the initial sample, which is consistent with OMRs being the most common form of share repurchase in Japan. For the purpose of this study, we analyze the 3495 cases of OMR announcements.

4.2. Sample characteristics

Table 2 describes the characteristics of the 3495 OMR announcements in the sample. Panel A shows the largest number of OMR announcements occurs in 2008, probably because the firms used share repurchases to support the stock prices following the financial crisis in 2008.[13] Panel B shows that 80.4% of all OMR announcements are made by firms with large market value of equity (i.e., shares listed on the first section of the TSE). Panel C shows that a total of 1219 companies repurchased shares through OMR for 3495 times between 2008 and 2017 (i.e., each company repurchases shares for an average of 2.87 times over the ten-year period). Further, 60% of the firms in the sample have repurchased shares multiple times during the ten-year period.

4.3. Descriptive statistics

Table 3 Panel A presents the descriptive statistics for the regression variables of Eqs. (1) and (2). On average, firms have 77.38% and 4.24% current completion rates (*CompRate*) and announcement returns (*CAR*), respectively. With respect to the reputation variables, firms have an average of −0.0046 and 76.41% industry-adjusted prior forecast accuracy (*Reputation*) and prior repurchase completion rates (*LagCompRate*), respectively. The result for *Reputation* implies that the management earnings forecasts of repurchasing firms are less accurate than their industry peers on average, though the median value of 0.0034 suggests otherwise. The planned number of shares to be repurchased (*PlanSize*) is on average 2.23% of the number of shares outstanding. The mean value of 4.0487 for *LnPlanDays* indicates that firms plan to spend around three months to complete the share repurchase program ($e^{4.0487}$ = 57.3 trading days). With respect to the motive variables, 83% of the firms in the sample state flexible capital policy as a reason for share repurchases. Also, 30–35% of firms choose to repurchase shares for capital efficiency and return to shareholders related reasons. Table 3 Panel B shows the distribution of the motives for share repurchases. One-half of the firms repurchase shares for a single reason, while the other half of the sample firms repurchase shares for multiple reasons.

Table 4 provides the correlation coefficients between independent variables in Eqs. (1) and (2). The table shows that the Pearson and Spearman correlation coefficients between the forecast reputation (*Reputation*) and the repurchase reputation (*LagCompRate*) are 0.1426 and 0.0965, respectively. Although the two reputation variables are significantly positively correlated, the correlation coefficient values are not high, suggesting that the two variables are capturing different aspects of firm reputation. Interestingly, both reputation variables, *Reputation* and *LagCompRate*, are most highly correlated with the firm size (*LnMVE*) with the Pearson (Spearman) correlation coefficient of 0.2887 (0.2884) and 0.2241 (0.1776), respectively. This is consistent with the univariate analysis findings in prior studies that document large firms have a greater tendency to issue more accurate earnings forecasts and a higher repurchase completion rates (Lee (2017); Bonaimé (2012)).

5. Completion rate analyses

5.1. Univariate analyses on completion rate

Table 5 presents the univariate results on the determinants of completion rate. We divide the sample into “low” and “high” subsamples according to the median value of each variable except for a dummy variable, *EmergeMkt*. In the case of *EmergeMkt*, “low” and “high” subsamples consist of observations that take the value of 0 and 1, respectively. With respect to the motive variables, we divide the sample according to whether or not the motive was stated in the announcement. We then compare the two subsamples based on their average completion rates. Difference-in-means tests are performed to compare the completion rate between the two subsamples of each determinant of the completion rate.

With regard to the forecast reputation of the firms (*Reputation*), firms whose forecast reputation below the median have an average completion rate of 75.56%, while firms whose forecast reputation above the median have an average completion rate of 80.10%. This difference between the mean values is statistically significant at the 1% level. The average completion rate of firms with prior repurchase completion rates (*LagCompRate*) below the median is 22.69 percentage points lower than that of firms with prior repurchase completion rates above the median (*t*-statistics = 21.69). The 22.69 percentage points difference in mean current completion rates is considerably higher than the 7.4 percentage points difference reported in Bonaimé (2012). Despite the observed difference in magnitude between Japan and the US, our results are consistent with repurchasing behavior persisting within firms. Overall, these results regarding the reputation variables suggest that both prior earnings forecast accuracy and prior repurchase

[13] As a robustness check, we dropped the observations in 2008 and the results remained qualitatively unchanged. We also dropped the observations for both 2008 and 2009 and the results still remained qualitatively unchanged.

Table 1
Sample selection.

On-/off-market	Acquisition resolution meeting	Repurchase method	*N*	%
On-market buying	Board of directors meeting	**OMR**	**3495**	**61.9**
	(Article 165, Para. 2 or Article 459, Para. 1 of the Act)	(iii) ToSTNeT repurchase	1597	28.3
		(iv) Mixed repurchase	386	6.8
	(ii) Shareholders meeting	OMR	29	0.5
	(Article 156, Para. 1 of the Act)	ToSTNeT repurchase	5	0.1
		Mixed repurchase	2	0.0
(i) Off-market buying	Board of directors	Tender offer	133	2.4
	Shareholders meeting	Tender offer	1	0.0
Total			5648	100.0

Table 1 presents the sample selection procedure. The base sample consists of 5648 share repurchase announcements made by companies listed on the first section, second section, and Mothers section of the TSE over the period from January 1, 2008 to December 31, 2017. Of the 5648 cases, we remove (i) share repurchases outside of the market, (ii) share repurchases through general shareholder meeting resolutions, and (iii-iv) share repurchases involving ToSTNeT repurchase. This selection procedure yields the final sample of 3495 cases of OMR (61.9%), written in bold.

Table 2
Sample characteristics.

	N	%
2008	934	26.7
2009	295	8.4
2010	279	8.0
2011	277	7.9
2012	255	7.3
2013	179	5.1
2014	240	6.9
2015	320	9.2
2016	417	11.9
2017	299	8.6
Total	3495	100.0

Panel B: Market type

	N	%
TSE 1st section	2810	80.4
TSE 2nd section	467	13.4
Mothers section	218	6.2
Total	3495	100.0

Panel C: Number of times

	No. of companies	%
1	487	40.0
2	262	21.5
3	172	14.1
4	113	9.3
5	42	3.4
6–7	63	5.2
8–10	47	3.9
11–14	21	1.7
Over 15	12	1.0
Total	1219	100.0

Table 2 describes the OMR announcements in the sample. We classify 3495 OMR cases from Table 1 into the following categories: Fiscal year (Panel A), Market type (Panel B), and Number of times that companies used OMR for their share repurchase programs (Panel C).

completion rates are positively associated with current repurchase completion rates.

The results in relation to other variables are generally consistent with Bonaimé (2012). Current repurchase completion rates are negatively related to repurchase plan size (*PlanSize*), repurchase plan days (*LnPlanDays*), emerging market (*EmergeMkt*), cash and short-term investments (*Cash*), leverage (*Leverage*), standard deviation of returns (*SDReturn*), and standard deviation of semi-annual operating cash flows over the three years (*SDCF*). On the other hand, current completion rates are positively related to firm size

Table 3
Descriptive statistics.

Panel A: Descriptive statistics of variables

				Percentiles	
Variable	*N*	Mean	S.D.	25th	50th	75th
CompRate	3495	0.7738	0.2936	0.6617	0.9003	1.0000
CAR	3483	0.0424	0.0661	0.0029	0.0346	0.0756
Reputation	2984	−0.0046	0.0334	−0.0091	0.0034	0.0116
LagCompRate	2742	0.7641	0.3053	0.6333	0.8992	1.0000
PlanSize	3494	0.0223	0.0178	0.0100	0.0173	0.0293
LnPlanDays	3495	4.0487	0.7852	3.4657	4.0604	4.5747
LagReturn	3483	−0.0211	0.1190	−0.0788	−0.0152	0.0441
EmergeMkt	3495	0.0624	0.2419	0.0000	0.0000	0.0000
LnMVE	3494	10.7551	1.8616	9.4850	10.5953	11.9533
BMR	3483	1.2366	0.7266	0.7133	1.1088	1.5876
Cash	3483	0.5319	0.6404	0.1820	0.3256	0.5952
CF	3398	0.1535	0.2271	0.0632	0.1136	0.1932
Leverage	3483	0.4576	0.2266	0.2842	0.4270	0.6031
SDReturn	3494	0.0240	0.0094	0.0172	0.0222	0.0291
SDCF	3403	0.1055	0.1638	0.0225	0.0486	0.1047
Motive						
Flexible capital policy	3495	0.8366	0.3698	1.0000	1.0000	1.0000
Capital efficiency	3495	0.3413	0.4742	0.0000	0.0000	1.0000
Shareholder value	3495	0.0910	0.2876	0.0000	0.0000	0.0000
Stock option	3495	0.0172	0.1299	0.0000	0.0000	0.0000
Return to shareholders	3495	0.3296	0.4701	0.0000	0.0000	1.0000
Share exchange	3495	0.0106	0.1024	0.0000	0.0000	0.0000
Capital restructure	3495	0.0017	0.0414	0.0000	0.0000	0.0000
Others	3495	0.0166	0.1278	0.0000	0.0000	0.0000

Panel B: Number of motives

	N	%
One	1773	50.7
Two	1210	34.6
Three	493	14.1
Four	19	0.5
Total	3495	100.0

Table 3 Panel A presents descriptive statistics on repurchase-related variables, while Panel B shows the number of motives stated in the repurchase announcement. *CompRate* is measured as actual repurchases divided by planned repurchase plan size. *CAR* is the 2-day market-adjusted abnormal returns over the event window $t = 0$ to 1. *Reputation* is measured as the industry-median adjusted management earnings forecast accuracy of net income averaged over three years prior to year y multiplied by -1. *LagCompRate* is the completion rate associated with the most recent prior repurchase announcement. *PlanSize* is the number of shares to be repurchased divided by the total number of shares outstanding (excluding treasury shares). *LnPlanDays* is the natural logarithm of the planned repurchase period expressed in trading days. *LagReturn* equals cumulative abnormal returns from 30 days to 1 day before the announcement of the repurchase program. *EmergeMkt* is a dummy variable that equals 1 if the firm is listed on the Mothers section of the TSE. *LnMVE* is the natural logarithm of the firm's market value of equity at the end of the month prior to the repurchase announcement. *BMR* is the book-to-market ratio at the end of the most recent quarter prior to the repurchase announcement. *Cash* equals cash and short-term investments divided by the market capitalization at the end of the most recent quarter prior to the repurchase announcement. *CF* is trailing 12 months operating cash flow of the most recent second or fourth quarter prior to the repurchase announcement divided by market capitalization. *Leverage* equals total liabilities divided by total assets at the end of the most recent quarter prior to the repurchase announcement. *SDReturn* is the standard deviation of stock returns for the 200-day period from 210 days to 11 days prior to the repurchase announcement. *SDCF* is the standard deviation of semi-annual operating cash flows over the three years divided by market capitalization at the end of the most recent quarter prior to the repurchase announcement. Each stated motive variable equals 1 if the motive was mentioned in the repurchase announcement, and 0 otherwise. All continuous variables are winsorized at the 1st and 99th percentiles.

(*LnMVE*).

With respect to the repurchase motives, average completion rates for firms with “flexible capital policy” included in the announcement as the share repurchase motive is 75.93%, while the average completion rates without it is 84.79%. This mean difference is statistically significant (t-statistic = −6.64). Average completion rate for firms with “capital efficiency”, “shareholder value”,

Table 4
Correlation matrix.

Variable	*Reputation*	*LagCompRate*	*PlanSize*	*LnPlanDays*	*LagReturn*	*LnMVE*	*BMR*	*Cash*	*CF*	*Leverage*	*SDReturn*	*SDCF*
Reputation	1	0.0965***	−0.1481***	−0.0660***	0.0016	0.2884***	−0.2041***	−0.1574***	−0.0699***	−0.1863***	−0.2454***	−0.2741***
LagCompRate	0.1426***	1	−0.0923***	−0.1833***	0.0081	0.1766***	0.0033	−0.0358*	−0.0061	−0.0452*	−0.0878***	−0.0658***
PlanSize	−0.1910***	−0.0726***	1	0.3538***	−0.0166	−0.1180***	0.0443*	0.1016***	0.0283	−0.0681***	0.1421***	0.0467**
LnPlanDays	−0.0602***	−0.1834***	0.3180***	1	0.0485**	−0.1384***	0.0464**	−0.0036	0.0015	−0.0112	−0.1032***	0.0126
LagReturn	0.0082	0.0119	−0.0365**	0.0479***	1	0.0530***	0.0056	−0.0019	−0.0178	0.0003	−0.0924***	0.0011
LnMVE	0.2887***	0.2241***	−0.1544***	−0.1063***	0.0361**	1	−0.3929***	−0.3271***	−0.0833***	0.0456*	−0.2134***	−0.3539***
BMR	−0.2145***	−0.0999***	0.0666***	0.0564***	0.0283*	−0.3827***	1	0.5672***	0.3417***	0.1142***	0.0272	0.5981***
Cash	−0.1592***	−0.0250	0.0108	−0.0307*	0.0158	−0.1023***	0.4842***	1	0.2152***	0.1706***	0.0669***	0.5182***
CF	−0.0780***	−0.0038	−0.0164	−0.0109	0.0063	0.0016	0.2806***	0.3591***	1	0.2722***	0.0225	0.2672***
Leverage	−0.1397***	−0.0296	−0.0755***	−0.0318*	0.0235	0.1318***	0.1211***	0.4365***	0.2656***	1	0.0371*	0.4919***
SDReturn	−0.2546***	−0.1146***	0.1652***	−0.1116***	−0.0808***	−0.3130***	0.0302*	0.0397**	−0.0248	−0.003	1	0.1036***
SDCF	−0.1898***	−0.0603***	−0.0054	−0.0195	−0.0135	−0.1553***	0.4820***	0.7131***	0.3393***	0.5174***	0.0790***	1

Table 4 presents correlations between independent variables for Eqs. (1) and (2). Pearson (Spearman) correlations are presented below (above) the diagonal. All variables are defined in Table 3. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Table 5
Univariate results on determinants of repurchase completion rates.

			High – Low	
Variable	Low	High	Difference	*t*-statistic
Reputation	0.7556	0.8010	0.0454	4.27***
LagCompRate	0.6542	0.8811	0.2269	21.69***
PlanSize	0.8056	0.7418	−0.0639	−6.47***
LnPlanDays	0.8249	0.7247	−0.1002	−10.23***
LagReturn	0.7788	0.7686	−0.0102	−1.03
EmergeMkt	0.7790	0.6952	−0.0838	−4.09***
LnMVE	0.7307	0.8171	0.0865	8.80***
BMR	0.7794	0.7683	−0.0111	−1.12
Cash	0.7886	0.7591	−0.0295	−2.97***
CF	0.7772	0.7750	−0.0022	−0.22
Leverage	0.7966	0.7510	−0.0456	−4.59***
SDReturn	0.7998	0.7480	−0.0518	−5.23***
SDCF	0.7992	0.7526	−0.0466	−4.70***
			Stated – Not Stated	
Motive	Not Stated	Stated	Difference	*t*-statistic
Flexible capital policy	0.8479	0.7593	−0.0886	−6.64***
Capital efficiency	0.7570	0.8061	0.0491	4.71***
Shareholder value	0.7707	0.8046	0.0339	1.97**
Stock option	0.7723	0.8581	0.0858	2.24**
Return to shareholders	0.7467	0.8287	0.0820	7.83***
Share exchange	0.7727	0.8741	0.1014	2.09**
Capital restructure	0.7737	0.7888	0.0150	0.13
Others	0.7741	0.7512	−0.0230	−0.59

Table 5 presents completion rate mean values for subsets of firms, formed by segmenting the sample into high and low groups for each determinant. "High" ("Low") implies that the subset of firms is above (below) the median value of the continuous variable. In the case of *EmergeMkt*, a dummy variable, "High" ("Low") indicates that the subset of firms takes the value of 1 (0). "Stated" ("Not Stated") implies that the firm mentioned (did not mention) the motives in its announcement. The last two columns present the difference in means and the *t*-statistic from difference in means tests. All variables are defined in Table 3. ** and *** represent significance at the 5% and 1% levels, respectively.

"stock option", "return to shareholders", and "share exchange" stated as the motive for share repurchases is significantly higher than those without it by 4.91, 3.39, 8.58, 8.20, and 10.14 percentage points, respectively.

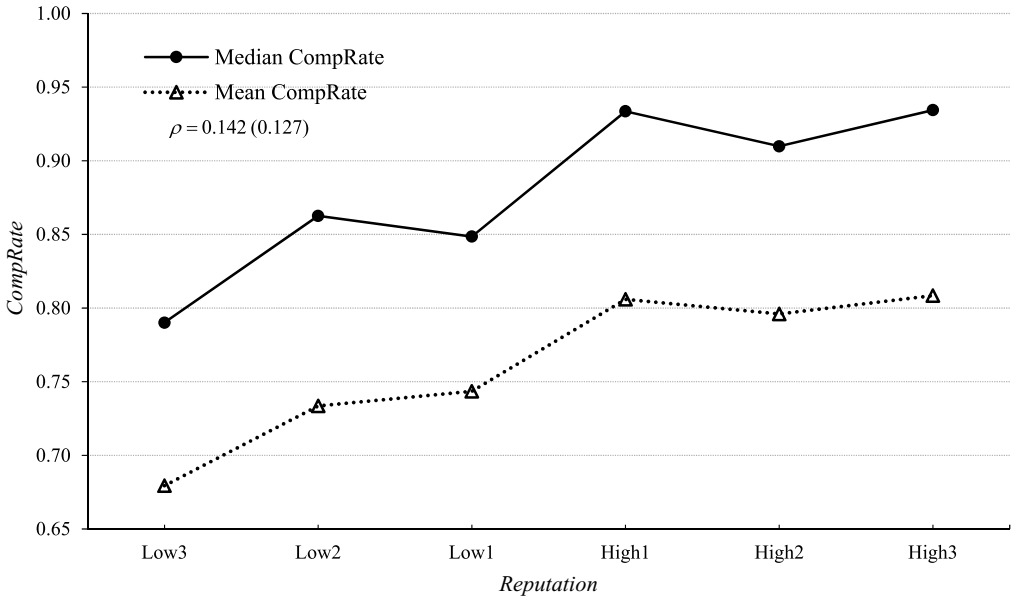
Fig. 2 analyzes the relation between the effect of forecast reputation (*Reputation*) and repurchase reputation (*LagCompRate*) on current completion rates (*CompRate*). Specifically, we first divide the sample according to the sign of *Reputation*. This results in 913 observations for the low *Reputation* group and 1442 observations for the high *Reputation* group. Next, within each group, we further partition the sample into three equally-sized subsamples according to the value of *Reputation*. Therefore, Low3 (High3) consists of observations with lowest (highest) forecast reputation. We then examine the average completion rate (*CompRate*) along these six categories. Fig. 2(a) shows the average current completion rates are increasing in the firms' forecast reputation, suggesting that firms with a record of accurate forecasting are more likely to complete the repurchase.

Next, we divide the sample into 11 categories according to the firm's prior repurchase completion rates. Each category represents a range of *LagCompRate* values, and is between 0 and 1, incremental by 0.1. The lowest *LagCompRate* has a range of 0.0 to 0.09, while the highest *LagCompRate* is 1. Fig. 2(b) shows the average current completion rates are increasing in the firms' reputation with respect to prior repurchase completion rates, suggesting repurchase completion persists within the firm. Overall, Figs. 2(a) and 2(b) show the two types of reputation are positively associated with current completion rates, although the positive association is stronger for repurchase reputation than for forecast reputation.

5.2. Multivariate analyses on completion rate

Table 6 Columns (1a) and (1b) present the results from estimating the Tobit models of *CompRate* using forecast reputation (*Reputation*) and repurchase reputation (*LagCompRate*), respectively, whereas Columns (1c) and (1d) consider *Reputation* and *LagCompRate* jointly. The coefficient on *Reputation* is 1.0601, 0.5930, and 0.5817 in Columns (1a), (1c), and (1d), respectively, and is statistically different from zero. Untabulated results of the marginal effects at means (0.582 to 1.060) show that a 1-standard-deviation increase in forecast reputation (0.334) follows an increase in current completion rates of 1.94 to 3.54 percentage points, depending on the specifications of the model. The coefficient on *LagCompRate* is 0.6239, 0.6197, and 0.6173 in Columns (1b), (1c), and (1d), respectively, and is statistically significant. Again, untabulated results of the marginal effects at means (0.617 to 0.624) reveal that a 1-standard-deviation increase in repurchase reputation (0.305) is associated with an increase in current completion rates

(a) The association between *Reputation* and *CompRate*



(b) The association between *LagCompRate* and *CompRate*

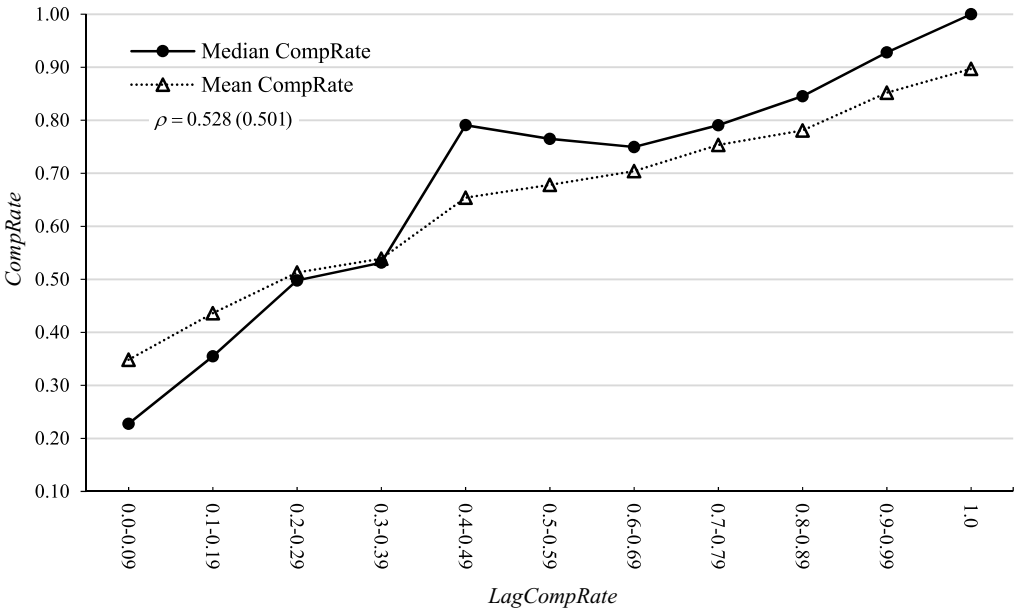


Fig. 2. The association between reputation variables and current completion rates.
Fig. 2(a) plots the mean and median *CompRate* based on *Reputation.* The sample is first divided according to the sign of *Reputation*, then partitioned into three equally-sized subsamples according to the value of *Reputation*. Low3 (High3) comprises observations with lowest (highest) forecast reputation. Fig. 2(b) plots the mean and median *CompRate* across share repurchases grouped based on *LagCompRate* (from 0.0 to 1.0, incremental by 0.1). The Pearson (Spearman) correlation coefficient between *Reputation* and *CompRate* is 0.142 (0.127), while that between *LagCompRate* and *CompRate* is 0.528 (0.501).

Table 6
Completion rate Tobits.

Variables	(1a)	(1b)	(1c)	(1d)
Constant	1.0854	0.5758	0.5906	0.6178
	(10.74)***	(6.37)***	(6.52)***	(6.33)***
Reputation	1.0601		0.5930	0.5817
	(3.61)***		(2.31)**	(2.26)**
LagCompRate		0.6239	0.6197	0.6173
		(23.74)***	(23.57)***	(23.44)***
PlanSize	−2.6341	−2.7912	−2.6445	−2.6600
	(−5.08)***	(−6.20)***	(−5.82)***	(−5.80)***
LnPlanDays	−0.1304	−0.0815	−0.0820	−0.0818
	(−11.50)***	(−8.08)***	(−8.14)***	(−8.09)***
LagReturn	−0.1169	−0.0928	−0.0899	−0.0916
	(−1.53)	(−1.39)	(−1.34)	(−1.37)
EmergeMkt	−0.0230	−0.0205	−0.0186	−0.0213
	(−0.48)	(−0.49)	(−0.45)	(−0.51)
LnMVE	0.0315	0.0144	0.0121	0.0109
	(5.20)***	(2.73)***	(2.26)**	(1.95)*
BMR	0.0530	0.0357	0.0391	0.0392
	(3.16)***	(2.44)**	(2.66)***	(2.65)***
Cash	0.0090	0.0132	0.0115	0.0106
	(0.38)	(0.64)	(0.56)	(0.52)
CF	−0.0351	−0.0493	−0.0483	−0.0465
	(−0.83)	(−1.32)	(−1.29)	(−1.24)
Leverage	−0.1014	−0.0890	−0.0784	−0.0822
	(−2.15)**	(−2.16)**	(−1.89)*	(−1.98)**
SDReturn	0.0501	−0.6842	−0.2301	−0.1989
	(0.04)	(−0.64)	(−0.21)	(−0.18)
SDCF	−0.0299	0.0237	0.0304	0.0284
	(−0.34)	(0.31)	(0.39)	(0.36)
Flexible capital policy				−0.0179
				(−0.73)
Capital efficiency				−0.0024
				(−0.14)
Shareholder value				0.0210
				(0.80)
Stock option				−0.0663
				(−0.76)
Return to shareholders				0.0057
				(0.30)
Share exchange				0.0142
				(0.16)
Capital restructure				−0.2198
				(−0.66)
Others				−0.0650
				(−1.03)
Year Dummies	Included	Included	Included	Included
Pseudo R^2	0.120	0.282	0.283	0.284
N	2355	2355	2355	2355

Table 6 presents coefficient estimates from Tobit regressions on repurchase plan completion rates in Eq. (1). *z*-statistics are presented in parentheses below each coefficient estimate. All variables are defined in Table 3. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

of 18.85 to 19.05 percentage points.[14] The comparison of marginal effects between *Reputation* and *LagCompRate* indicates that repurchase reputation has a larger economic impact on the current repurchase completion rates than forecast reputation. Nevertheless, both *Reputation* and *LagCompRate* have an incremental explanatory power in our model of current repurchase completion rates. Further, Table 6 suggests that repurchase plan size (*PlanSize*), repurchase plan days (*LnPlanDays*), and firm leverage (*Leverage*) are significantly negatively related to completion rates, while firm size (*LnMVE*) and book-to-market ratio (*BMR*) are significantly positively related to current completion rates. Lastly, Column (1d) shows that even after controlling for the stated motives, both *Reputation* and *LagCompRate* remain positive and statistically different from zero, suggesting that a firm's forecast reputation is positively associated with current repurchase completion rates, given the firm's repurchase reputation.

[14] The marginal effect of prior repurchase completion rates on current repurchase completion rates is somewhat higher than that documented by Bonaimé (2012). She reports a 1-standard-deviation increase in lagged completion rate is associated with an increase in current completion rate of around 10 percentage points.

Table 7
Market response regressions.

Variables	(2a)	(2b)	(2c)	(2d)
Constant	0.0658	0.0464	0.0483	0.0553
	(3.47)***	(2.36)**	(2.45)**	(2.70)***
Reputation	0.1195		0.1007	0.1005
	(2.71)***		(2.49)**	(2.40)**
LagCompRate		0.0233	0.0224	0.0225
		(4.40)***	(4.18)***	(4.34)***
PlanSize	1.2903	1.2614	1.2874	1.2976
	(13.67)***	(13.29)***	(14.12)***	(14.56)***
LnPlanDays	−0.0126	−0.0108	−0.0108	−0.0111
	(−7.27)***	(−7.02)***	(−7.05)***	(−7.22)***
LagReturn	−0.0050	−0.0051	−0.0046	−0.0043
	(−0.53)	(−0.51)	(−0.46)	(−0.43)
EmergeMkt	−0.0077	−0.0081	−0.0077	−0.0081
	(−0.55)	(−0.61)	(−0.59)	(−0.61)
LnMVE	−0.0028	−0.0031	−0.0034	−0.0034
	(−3.02)***	(−3.41)***	(−4.04)***	(−3.71)***
BMR	0.0079	0.0068	0.0074	0.0074
	(4.56)***	(4.33)***	(4.53)***	(4.64)***
Cash	−0.0012	−0.0008	−0.0010	−0.0011
	(−0.72)	(−0.47)	(−0.65)	(−0.61)
CF	0.0073	0.0069	0.0071	0.0071
	(1.66)*	(1.51)	(1.64)	(1.54)
Leverage	0.0035	0.0023	0.0041	0.0041
	(0.51)	(0.37)	(0.63)	(0.65)
SDReturn	0.7516	0.6667	0.7466	0.7741
	(1.53)	(1.48)	(1.64)	(1.71)*
SDCF	−0.0038	−0.0033	−0.0026	−0.0019
	(−0.29)	(−0.27)	(−0.21)	(−0.15)
Flexible capital policy				−0.0051
				(−1.00)
Capital efficiency				−0.0014
				(−0.67)
Shareholder value				−0.0069
				(−1.99)**
Stock option				−0.0199
				(−3.20)***
Return to shareholders				−0.0035
				(−0.96)
Share exchange				−0.0018
				(−0.15)
Capital restructure				−0.0590
				(−6.08)***
Others				0.0001
				(0.01)
Year Dummies	Included	Included	Included	Included
Adjusted R^2	0.172	0.182	0.184	0.184
N	2339	2339	2339	2339

Table 7 presents OLS regression results describing the market response to the share repurchase announcement in Eq. (2). *t*-statistics are presented in parentheses below each coefficient estimate and are based on two-way cluster-robust standard errors by firm and year. All variables are defined in Table 3. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

6. Announcement returns analyses

6.1. Multivariate analyses on announcement returns

In this section, we describe the relation between our reputation proxies and the perceived credibility of repurchase announcements. The extant literature documents that the stock market incorporates a firm's repurchase reputation with respect to prior repurchase completion rates into its reaction to the firm's subsequent repurchase announcement. Given that forecast reputation is positively correlated with current repurchase completion rates, we are interested in whether the forecast reputation of the firm also affects how the stock market responds to share repurchase announcements. That is, does the stock market incorporate a firm's forecast reputation into its reactions to share repurchase announcements? Similar to the approach in Table 6, Columns (2a) and (2b) of Table 7 consider the effect of forecast reputation (*Reputation*) and repurchase reputation (*LagCompRate*) on stock returns around OMR announcements, respectively, while Columns (2c) and (2d) of Table 7 consider the joint effect of both reputation variables.

We find the announcement returns are increasing in prior repurchase completion rates for all specifications in Columns (2b)

through (2d). The estimated coefficient on *LagCompRate* of around 0.022 indicates a 1-standard-deviation increase in *LagCompRate* (0.305) is associated with an increase in announcement returns of 67.17-basis-point. Interestingly, the significantly positive coefficient on *Reputation* in Column (2a) provides evidence that the stock market considers the firm's forecast reputation established through the record of accurate earnings forecasting when evaluating the firm's OMR announcement. The coefficient on *Reputation* in Columns (2c) and (2d) is also positive and significantly different from zero, even after controlling for prior repurchase completion rates and other factors. The estimated coefficient on *Reputation* of nearly 0.101 suggests a 1-standard-deviation increase in *Reputation* (0.334) is associated with an increase of 33.73-basis-point in announcement returns. The marginal effects of *Reputation* and *LagCompRate* are both economically meaningful, considering their effects represent 7.96% and 15.84% of the mean value of announcement returns, respectively.

Overall, these results suggest that the firm's forecast reputation has an incremental power in explaining how prior repurchasing behavior influences the market reactions to subsequent repurchase announcements. With respect to the control variables, announcement returns are significantly positively related to *PlanSize* and *BMR*, but negatively related to *LnPlanDays* and *LnMVE*[15]. Among the motives variables, the coefficients on *Shareholder value*, *Stock option*, and *Capital restructure* are negative and statistically significant.

6.2. Interaction between forecast and repurchase reputations

The results presented in Table 7 suggest that both forecast and repurchase reputation variables, *Reputation* and *LagCompRate*, have incremental explanatory powers in explaining the stock market response to the announcement of a share repurchase. Nevertheless, we do not examine how the two reputation variables interact with each other. Therefore, in this section, we examine the interaction effect between forecast reputation and repurchase reputation. Specifically, we are interested in whether the effect of forecast reputation on the stock market reaction to OMR announcements is more (less) pronounced when the repurchase reputation is low (high). To explore this possibility, we estimate the following regression models.

$$\begin{aligned} CAR_{iyj} &= \alpha_0 + \alpha_1 LowLagCompRate_{iyj} + \alpha_2 Reputation_{iyj} \\ &\quad + \alpha_3 Reputation{*}LowLagCompRate_{iyj} + \eta Control\ Variables \\ &\quad + \gamma Motive\ Dummies_{iyj} + \delta Year\ Dummies_{y} + \varepsilon_{iyj}, \end{aligned} \tag{3a}$$

$$\begin{aligned} CAR_{iyj} &= \beta_0 + \beta_1 HighLagCompRate_{iyj} + \beta_2 Reputation_{iyj} \\ &\quad + \beta_3 Reputation{*}HighLagCompRate_{iyj} + \eta Control\ Variables \\ &\quad + \gamma Motive\ Dummies_{iyj} + \delta Year\ Dummies_{y} + \varepsilon_{iyj}, \end{aligned} \tag{3b}$$

where,

LowLagCompRate: a dummy variable that equals to 1 if the value of *LagCompRate* is in the bottom quartile of the distribution; and

HighLagCompRate: a dummy variable that equals to 1 if the value of *LagCompRate* is in the top quartile of the distribution.

With respect to Eq. (3a), the coefficient on *Reputation*, α_2, represents the effect of forecast reputation for firms with non-low repurchase reputation on the announcement returns, while the sum of the two coefficients on *Reputation* and *Reputation*LowLagCompRate*, $\alpha_2 + \alpha_3$, captures the effect of forecast reputation for firms with low repurchase reputation on the announcement returns. As for Eq. (3b), the coefficient on *Reputation*, β_2, represents the effect of forecast reputation for firms with non-high repurchase reputation on the announcement returns, while the sum of the two coefficients on *Reputation* and *Reputation*HighLagCompRate*, $\beta_2 + \beta_3$, captures the effect of forecast reputation for firms with high repurchase reputation on the announcement returns.

Table 8 reports the results from estimating Eqs. (3a) and (3b). Column (3a) of the table shows that the effect of forecast reputation on announcement returns is 0.2766 (*F*-statistic = 8.07) and 0.0366 (*t*-statistic = 0.95) for firms with low repurchase reputation and non-low repurchase reputation, respectively. Column (3b) of the table displays that the effect of forecast reputation is 0.0482 (*F*-statistic = 0.47) and 0.1382 (*t*-statistic = 3.04) for firms with high repurchase reputation and non-high repurchase reputation, respectively. These results from the analysis of the interaction effect between forecast and repurchase reputations suggest that the impact of forecast reputation on the repurchase announcement returns is significantly more pronounced when the firm has a low repurchase reputation. On the other hand, when the firm has a high repurchase reputation, the impact of forecast reputation on the announcement returns appears to be negligible.

[15] The results should be interpreted with the shorter planned repurchase period in Japan than the US. Specifically, Japanese firms are required to complete a share repurchase program within a year, which makes it less likely for unforeseen events to disrupt the managers' intentions for executing share repurchases. This time limit could imply that reputation matters less in contexts where managers have less overall discretion, such as discretion over the timing of corporate actions. Hence, it is possible that our results are likely attenuated relative to other contexts where we would reasonably expect managers to have greater discretion.

Table 8
Interaction between forecast and repurchase reputations.

	(3a) Low Repurchase Reputation		(3b) High Repurchase Reputation	
Variables	coefficient	*t*-statistic	coefficient	*t*-statistic
LowLagCompRate	−0.0117	−3.17***		
HighLagCompRate			0.0076	3.62***
Reputation	0.0366	0.95	0.1382	3.04***
*Reputation*LowLagCompRate*	0.2400	2.43**		
*Reputation*HighLagCompRate*			−0.0900	−1.61
Control Variables	Included		Included	
Motive Dummies	Included		Included	
Year Dummies	Included		Included	
	$\alpha_2 + \alpha_3$	*F*-statistic	$\beta_2 + \beta_3$	*F*-statistic
F-test ($\alpha_2 + \alpha_3 = 0, \beta_2 + \beta_3 = 0$)	0.2766	8.07***	0.0482	0.47
Adjusted R^2	0.180		0.173	
N	2339		2339	

Table 8 presents OLS regression results describing the market response to the share repurchase announcement in Eqs. (3a) and (3b). *LowLagCompRate* is a dummy variable that equals 1 if the value of *LagCompRate* is in the bottom quartile of the distribution. *HighLagCompRate* is a dummy variable that equals 1 if the value of *LagCompRate* is in the top quartile of the distribution. Other variables are defined in Table 3. *t*-statistics are based on two-way cluster-robust standard errors by firm and year. ** and *** represent significance at the 5% and 1% levels, respectively.

7. Additional analyses

7.1. First-timer

We conceive that it is possible for a firm with no history of share repurchases to make an OMR announcement. If this is the case, the stock market would not have the firm's prior repurchase completion rates on which the credibility of the firm's OMR announcements can be assessed. Further, given that the requirement for Japanese firms to provide initial management earnings forecasts at the beginning of the fiscal year has been in force for an extensive period of time, it would be interesting to investigate whether the stock market would turn to the firm's forecast reputation (*Reputation*) in the absence of repurchase reputation (*LagCompRate*), when evaluating the credibility of its first OMR announcement.

We construct two samples. First, a firm is classified as a first timer of share repurchase if the firm has not announced a share repurchase in the last three years (observations = 901). Second, a firm is classified as a first timer of share repurchase if the firm has never announced a share repurchase in the past (observations = 598). We rerun the regressions of Eqs. (1) and (2) without the repurchase reputation variable, *LagCompRate*, on the two samples. *LagCompRate* is dropped because first timers of share repurchase do not have prior repurchase completion rates. The second and fourth columns of Table 9 report the results from estimating the Tobit model of Eq. (1) using the two samples, while the third and fifth columns of Table 9 report the results from estimating the OLS model of Eq. (2) using the two samples.

With regard to the completion analysis in Eq. (1), the estimated coefficient on *Reputation* is 0.3806 (*t*-statistic = 4.90) and 0.4886 (*t*-statistic = 1.92) for the first and second samples, respectively. This suggests that a firm's forecast reputation is positively associated with current repurchase completion rates. The market response analysis in Eq. (2) also reveals that the estimated coefficient on *Reputation* is significantly positive with its value of 0.1347 (*t*-statistic = 2.24) and 0.1210 (*t*-statistic = 2.62) for the first and second samples, respectively. Moreover, these estimated coefficient values on *Reputation* in Eq. (2) are larger than those reported in Table 7, implying that the economic impact of forecast reputation on announcement returns is stronger for firms that repurchase shares for the first time. These results indicate that the stock market does indeed turn to the firm's reputation established through a record of accurate management earnings forecasting in the absence of prior repurchase completion rates, when it evaluates the credibility of the firm's OMR announcements.

7.2. Forecast error

In the analysis thus far, we define forecast reputation as the managerial ability to predict earnings accurately, and thus the absolute value of forecast error is used to measure forecast accuracy. However, this definition of forecast reputation assumes that the market perception of forecast reputation is indiscriminate between underestimation and overestimation of earnings. Although we could not find any prior studies on forecasting reputation that examine the differential effects of signed forecast error, we find some related evidence in the literature on CEO turnover.[16]

Trueman (1986) suggests that management earnings forecasts provide a public signal regarding a manager's ability to anticipate

[16] To our knowledge, prior studies that investigate the effect of forecast reputation always use the accuracy (absolute value of forecast error) of prior management earnings forecasts and do not provide evidence on the robustness against the usage of a signed forecast error (e.g., Williams (1996); Hutton and Stocken (2009); Yang (2012); Ng et al. (2013)).

Table 9
First-timer regressions.

	First-time in the last three years		First-time in history	
Variables	(1) *CompRate*	(2) *CAR*	(1) *CompRate*	(2) *CAR*
Constant	0.7191	0.0464	0.7478	0.0118
	(3.62)***	(1.72)*	(2.62)***	(0.49)
Reputation	0.3806	0.1347	0.4886	0.1210
	(4.90)***	(2.24)**	(1.92)*	(2.62)***
PlanSize	−3.4765	1.0375	−3.8644	1.1012
	(−4.63)***	(11.78)***	(−4.83)***	(13.76)***
LnPlanDays	−0.0421	−0.0035	−0.0405	0.0007
	(−3.30)***	(−1.60)	(−2.06)**	(0.38)
LagReturn	−0.1008	0.0045	−0.0744	−0.0001
	(−2.42)**	(0.39)	(−1.55)	(−0.01)
EmergeMkt	−0.1035	−0.0027	−0.1833	0.0139
	(−1.44)	(−0.27)	(−2.70)***	(1.24)
LnMVE	0.0212	−0.0038	0.0240	−0.0033
	(1.61)	(−3.54)***	(1.58)	(−2.62)***
BMR	0.0618	0.0014	0.0315	0.0025
	(5.70)***	(0.43)	(1.52)	(0.79)
Cash	0.0286	0.0024	0.0297	0.0032
	(0.78)	(0.47)	(0.55)	(1.44)
CF	0.0032	0.0106	0.0536	0.0094
	(0.06)	(2.04)**	(0.83)	(1.75)*
Leverage	0.0247	−0.0057	−0.0154	−0.0011
	(0.80)	(−0.76)	(−0.55)	(−0.11)
SDReturn	3.4544	0.5618	5.6702	0.6185
	(1.40)	(1.78)*	(1.65)	(3.26)***
SDCF	−0.2113	0.0136	−0.1625	0.0215
	(−5.05)***	(0.72)	(−2.17)**	(1.14)
Motive Dummies	Included	Included	Included	Included
Year Dummies	Included	Included	Included	Included
Pseudo / Adjusted R^2	0.189	0.191	0.191	0.231
N	901	893	598	594

Table 9 presents results of estimating Eqs. (1) and (2) without *LagCompRate* using samples of firms that have repurchased shares for the first time. We construct two samples. First, a firm is classified as a first timer of share repurchase if the firm has not announced a share repurchase in the last three years (observations = 901). Second, a firm is classified as a first timer of share repurchase if the firm has never announced a share repurchase in the past (observations = 598). For Eq. (1), *z*-statistics are presented in parentheses below each coefficient estimate. For Eq. (2), *t*-statistics are based on two-way cluster-robust standard errors by firm and year, and are presented in parentheses below each coefficient estimate. All variables are defined in Table 3. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

future changes in the firm's business environment and to adjust the firm's operations accordingly. Following this argument, Lee et al. (2012) investigate whether the probability of CEO turnover is related to management earnings forecast accuracy, and find that the CEO turnover rate is higher for firms in both the most pessimistic and optimistic earnings forecast groups. Lee et al. argue that beating the management earnings forecast targets is not enough for CEOs to retain the post. Based on this finding, they conclude that boards of directors use management forecast accuracy as a signal of CEOs' managerial ability, and that the cost of issuing inaccurate forecasts is borne by managers. These findings suggest that it is plausible for market participants to formulate firms' forecast reputation based on the magnitude of the forecast errors, regardless of their signs.

In this section, we define forecast error as management forecast of net income minus realized net income deflated by market value of equity averaged over three years prior to the announcement of share repurchase, and investigate whether the effect of forecast reputation on the market reaction is symmetrical between negative (pessimistic) and positive (optimistic) forecast errors. We emulate the specification used in Lee et al. (2012) and estimate the following models to examine the impact of forecast error on the current completion rate and the market response.

$$\begin{aligned} CompRate_{iyj} &= \alpha_0 + \alpha_1 Reputation{*}Pessimistic_{iyj} + \alpha_2 Reputation{*}Optimistic_{iyj} \\ &\quad + \alpha_3 LagCompRate_{iyj} + \eta Control\ Variables + \gamma Motive\ Dummies_{iyj} \\ &\quad + \delta Year\ Dummies_y + \varepsilon_{iyj}, \end{aligned} \tag{4}$$

$$\begin{aligned} CAR_{iyj} &= \beta_0 + \beta_1 Reputation{*}Pessimistic_{iyj} + \beta_2 Reputation{*}Optimistic_{iyj} \\ &\quad + \beta_3 LagCompRate_{iyj} + \eta Control\ Variables + \gamma Motive\ Dummies_{iyj} \\ &\quad + \delta Year\ Dummies_y + \varepsilon_{iyj}, \end{aligned} \tag{5}$$

where,

Pessimistic: a dummy variable that equals to 1 if the sign of the forecast error, defined as management forecast of net income minus

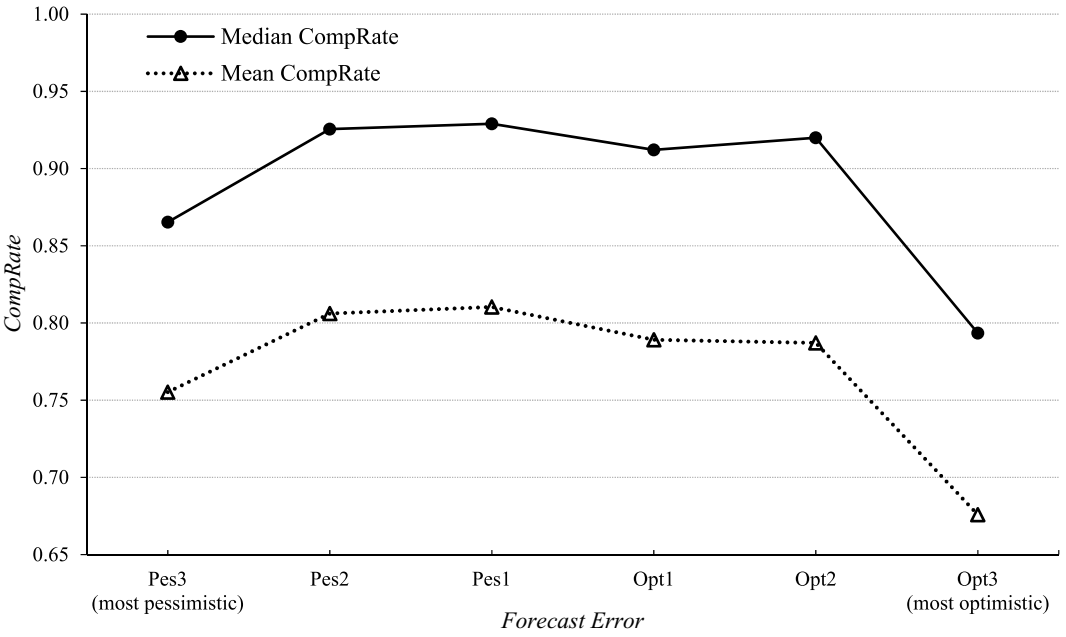


Fig. 3. The association between forecast error and current completion rate.
Fig. 3 plots the mean and median *CompRate* based on *Forecast Error* that is defined as management forecast of net income minus realized net income deflated by market value of equity averaged over three years prior to the share repurchase announcement. The sample is first divided according to the sign of Forecast Error, then partitioned into three equally-sized subsamples according to the value of Forecast Error. Pes3 (Opt3) comprises observations with most pessimistic (optimistic) management forecast of earnings.

realized net income deflated by market value of equity, averaged over three years prior to year *y* is negative; and

Optimistic: a dummy variable that equals to 1 if the sign of the forecast error, defined as management forecast of net income minus realized net income deflated by market value of equity, averaged over three years prior to year *y* is positive.

As a preliminary analysis, Fig. 3 plots the relation between earnings forecast errors (*Forecast Error*) and current completion rates (*CompRate*). We first divide the sample according to the sign of *Forecast Error*. This results in 1175 observations for the pessimistic *Forecast Error* group and 1180 observations for the optimistic *Forecast Error* group. Next, within each group, we further partition the sample into three equally-sized subsamples according to the value of *Forecast Error*. Therefore, Pes3 (Opt3) consists of observations with most pessimistic (optimistic) forecast errors. We then examine the average completion rate (*CompRate*) along these six categories. Fig. 3 shows the average current completion rates is distinctively lower for the most optimistic group (Opt3) than other groups. Interestingly, the most pessimistic group (Pes3) also has the lower average completion rate than other groups except for Opt3. Overall, Fig. 3 roughly displays a concave shape, which suggests that firms with a history of both overly underestimating and overestimating the earnings forecasts tend to complete the repurchase programs to a lesser extent.

Table 10 Panel A reports the results of multivariate analyses in Eqs. (4) and (5). The estimated coefficient on *Reputation*Pessimistic* and *Reputation*Optimistic* in Eq. (4) is 0.1184 (z-statistic = 0.95) and 0.8361 (z-statistic = 2.69), respectively, indicating that the degree of optimism in earnings forecasts has a larger impact on current completion rates than the degree of pessimism. However, the F-test that examines the difference between the two coefficients shows the difference of −0.7177 is not statistically significant (F-statistic = 2.16). The market response analysis in Eq. (5) produces similar results. It reveals that the estimated coefficient on *Reputation*Pessimistic* and *Reputation*Optimistic* is 0.1376 (t-statistic = 1.76) and 0.0792 (z-statistic = 2.03), respectively, and the difference between the two estimated coefficients, 0.0584, is not statistically significant (F-statistic = 0.54). Thus, consistent with the findings in Lee et al. (2012), the market does not appear to discriminate between underestimation and overestimation of earnings forecasts.

8. Conclusion

Firms establish a reputation through the consequences of their past announcements, which could influence how the stock market perceives the credibility of the firms' subsequent announcements. Previous studies document that the stock market considers prior repurchase completion rates (repurchase reputation) when evaluating the firm's repurchase announcement. Nevertheless, the question of whether reputation established from other sources of announcements also affects the stock market reaction has remained unanswered. This paper asks if the reputation established through a history of management earnings forecasting (forecast reputation) has a spillover effect on the market response to new repurchase announcements, given the firm's repurchase reputation.

Using a sample of 3495 OMR announcements over the period 2008–2017, we show that current repurchase completion rates are positively related to both forecast and repurchase reputations in various model specifications. We also document that these

Table 10
Forecast error regressions.

	(4) *CompRate*		(5) *CAR*	
Variables	coefficient	*z*-statistic	coefficient	*t*-statistic
*Reputation*Pessimistic*	0.1184	0.95	0.1376	1.76*
*Reputation*Optimistic*	0.8361	2.69***	0.0792	2.03**
LagCompRate	0.6163	23.41***	0.0226	4.33***
Control Variables	Included		Included	
Motive Dummies	Included		Included	
Year Dummies	Included		Included	
	$\alpha_1 - \alpha_2$	*F*-statistic	$\beta_1 - \beta_2$	*F*-statistic
F-test ($\alpha_1 - \alpha_2 = 0, \beta_1 - \beta_2 = 0$)	−0.7177	2.16	0.0584	0.54
Pseudo / Adjusted R^2	0.285		0.184	
N	2355		2339	

Table 10 presents results of estimating Eqs. (4) and (5). *Pessimistic* is a dummy variable that equals 1 if the sign of the forecast error, defined as management forecast of net income minus realized net income deflated by market value of equity, averaged over three years prior to year *y* is negative. *Optimistic* is a dummy variable that equals 1 if the sign of the forecast error, defined as management forecast of net income minus realized net income deflated by market value of equity, averaged over three years prior to year *y* is positive. Other variables are defined in Table 3. *t*-statistics are based on two-way cluster-robust standard errors by firm and year. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

reputations are both drivers of announcement returns, and that the stock market reaction to forecast reputation is particularly strong when the repurchase reputation is low. Further, using a subset of firms that have undertaken OMRs for the first time (i.e., when there is no repurchase reputation), we find that the stock market turns to forecast reputation within the firm on which the credibility of repurchase announcements is assessed. Overall, the findings of this study suggest that a firm establishes a reputation through multiple sources of announcements, which can in turn affect how the stock market assesses the credibility of the firm's subsequent announcements.

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