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Discontinuities in earnings and earnings change distributions after J-SOX implementation: Empirical evidence from Japan

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Abstract

Prior research finds that the Sarbanes-Oxley Act (US-SOX) of 2002 has affected earnings management in the United States. Cohen et al. (2008) indicate that accrual-based earnings management has declined since the passage of US-SOX, while real earnings management has increased. Further, Gilliam et al. (2015) show that the zero-earnings discontinuity has disappeared since its passage, indicating that earnings management to avoid losses has decreased as a result. In Japan, the Financial Instruments and Exchange Act of 2006, the so-called Japanese version of SOX (J-SOX), was implemented for fiscal years starting in April 2008. Similar to US-SOX, J-SOX aims to reinforce the corporate governance of financial reporting. This study investigates whether the discontinuity in the distributions of earnings and earnings changes disappeared after J-SOX implementation. In contrast to US-SOX, the results indicate that the discontinuity in the earnings distribution at zero did not disappear after J-SOX implementation. However, the discontinuity in the earnings change distribution at zero almost disappeared after J-SOX implementation, indicating that earnings management to avoid earnings decreases became less prevalent. In addition, the results indicate that the discontinuity in the distribution of earnings changes before J-SOX implementation was mainly caused by habitual beaters and that earnings management by habitual beaters to avoid earnings decreases was less prevalent after J-SOX implementation.

Keywords: earnings distribution, earnings management, loss avoidance, earnings decrease avoidance, Sarbanes-Oxley Act, Financial Instruments and Exchange Act of Japan

JEL Classification: G38; M41; M48

1. Introduction

Many studies show that the distributions of earnings and earnings changes have a discontinuity around zero, indicating that firms manage earnings to avoid losses and earnings decreases (e.g., Burgstahler and Dichev, 1997; Degeorge et al., 1999; Hayn, 1995).[1] Prior studies also provide evidence that managers use real earnings management (e.g., Gunny, 2010; Roychowdhury, 2006) and accrual-based earnings management (e.g., Hansen, 2010; Zang, 2012) to avoid losses and earnings decreases. Similarly, with regard to Japanese firms, prior studies find a discontinuity in the distributions of earnings and earnings changes; they also indicate that managers engage in accrual-based earnings management (Suda and Shuto, 2007) and real earnings management (Yamaguchi, 2009) to achieve these benchmarks.

Recently, important laws on corporate financial reporting have been established in the United States and Japan after major accounting scandals. In the United States, the Sarbanes-Oxley Act (US-SOX) was established in 2002 as a reaction to serious corporate scandals including Enron and Worldcom. Some provisions of US-SOX have been formulated to reduce opportunistic financial reporting, including the certification of financial statement accuracy by CEOs and CFOs, external auditor assessment of internal control, and increased legal penalties for CEOs and CFOs with regard to financial misreporting.

After major Japanese accounting scandals (e.g., Seibu Railway, Kanebo, and Livedoor), the Japanese Diet passed the Financial Instruments and Exchange Act of 2006, the so-called Japanese version of SOX (J-SOX).[2] The Act was implemented for all listed firms for fiscal years starting in April 2008. Similar to US-SOX, the purpose of J-SOX is to reinforce the corporate governance of financial reporting. J-SOX requires a manager's confirmation of financial statement accuracy, a manager's assessment of internal control and preparation of internal control reports, and external auditors' audit of internal control reports. In addition, it imposes penalties on managers for the misstatement of internal control reports.

Prior studies find that US-SOX affects managers' earnings management activities.[3] Lobo and Zhou (2006, 2010) indicate that firms have become more conservative and report lower discretionary accruals since the passage of US-SOX. Cohen et al. (2008) indicate that accrual-based earnings

[1] Prior research also shows the discontinuity in forecast error distributions, indicating that managers manipulate earnings to meet analysts' forecast earnings (e.g., Burgstahler and Eames, 2006; Degeorge et al., 1999). However, we do not focus on the distribution of forecast errors because such a distribution is affected not only by earnings management but also by forecast management.

[2] "The diet shall be the highest organ of state power, and shall be the sole law-making organ of the State" (The Constitution of Japan, Article 41). The Diet in Japan is equivalent to the U.S. Congress.

[3] The effect of US-SOX is not limited to the effect on earnings management. For example, prior research suggests an increase in the voluntary disclosure of information security activities (Gordon et al., 2006), a change in investors' valuation weight for each earnings component (Kalelkar and Nwaeze, 2011), and a change in disciplining CEOs and CFOs in response to restatements after the passage of US-SOX (Burks, 2010).

management has declined since the passage of US-SOX, while real earnings management has increased. Caylor (2010) provides evidence that managers prefer to use discretion in deferred revenue relative to accounts receivable to avoid negative earnings surprises but that US-SOX has mitigated this preference. Gilliam et al. (2015) use an earnings distribution approach to test whether *total* earnings management has changed since the passage of US-SOX. They show that the zero-earnings discontinuity has disappeared since US-SOX implementation, indicating that total earnings management to avoid losses has decreased as a result. In their supplemental analyses, Gilliam et al. (2015) also find that the discontinuity in the distributions of earnings changes and analysts' forecast errors have declined since the passage of US-SOX but that neither has disappeared completely.

Given the tighter regulations for managers on financial reporting under J-SOX, managers' earnings management could decrease. Thus, in line with Gilliam et al. (2015), we anticipate that the discontinuity in the earnings distribution for Japanese firms disappeared after J-SOX implementation, a situation that is the same as that experienced by U.S. firms. Consequently, this study investigates whether the discontinuity in the earnings distribution disappeared after March 2009 in Japan. We focus on the distributions of earnings and earnings changes. We do not focus on the distribution of forecast errors because this is affected not only by earnings management but also by forecast management.[4] Especially in strong investor protection countries such as the United States and Japan, managers tend to use forecast guidance to avoid negative earnings surprises (Brown and Higgins, 2005).

Some differences exist between US-SOX and J-SOX. Following the criticism that firms bear high costs under US-SOX, J-SOX was developed so that the cost burden of managers' assessments and auditors' audits regarding internal control over financial reporting would not be excessive. In particular, according to the Business Accounting Council (2007), J-SOX has six measures that differ from US-SOX: (1) the use of a top-down/risk-based approach, (2) the classification of internal control deficiencies (two categories), (3) no direct reporting, (4) the integration of internal control audits with financial statement audits, (5) the preparation of a unified internal control audit report and financial statement audit report, and (6) coordination between corporate auditors/audit committee and internal auditors. Overall, the procedures required by J-SOX are more concise than

[4] In Japan, managers' earnings forecasts are more prevalent than analysts' earnings forecasts because the rules of the Tokyo Stock Exchange require managers of listed firms to disclose earnings forecasts regularly (Kato et al., 2009). Based on Gilliam et al. (2015), we analyze the distributions of managers' earnings forecast errors in a supplemental analysis. Similar to the results of analysts' earnings forecasts under US-SOX (Gilliam et al., 2015), our results (not tabulated) suggest that the discontinuity in the managers' forecast error distribution declined after the passage of J-SOX but still exists. Given the asymmetrically large negative stock price response to negative earnings surprises (Skinner and Sloan, 2002), managers' incentives to avoid negative earnings surprises should be considerably strong. As a result, the discontinuity in the forecast error distribution may not disappear altogether under both US-SOX and J-SOX.

those required by US-SOX because of an emphasis on cost-effectiveness. These differences between US-SOX and J-SOX may lead to different effects on managers' earnings management activities.

The results indicate that the discontinuity in the earnings distribution at zero did not disappear after J-SOX implementation. However, we find that the discontinuity in the earnings change distribution at zero almost disappeared after J-SOX implementation, indicating that earnings management to avoid earnings decreases became less prevalent. In addition, the results indicate that the discontinuity in the distribution of earnings changes before J-SOX implementation was mainly caused by habitual beaters and that earnings management by habitual beaters to avoid earnings decreases reduced after J-SOX implementation.

This study contributes to the earnings management literature. Whereas Gilliam et al. (2015) present the first research to investigate the effect of US-SOX on U.S. firms' earnings distributions, this study is the first to examine the effect of J-SOX on Japanese firms' earnings distributions. Consequently, new insights are provided into the effect of J-SOX on total earnings management in Japanese firms. In addition, this study enables a comparison of the effect of US-SOX on U.S. firms with that of J-SOX on Japanese firms. Gilliam et al. (2015) find that since the passage of US-SOX, the discontinuity in the earnings distribution at zero has disappeared and that the discontinuity in the earnings change distribution at zero has declined. Consistent with Gilliam et al. (2015), this study indicates that the discontinuity in the earnings change distribution at zero declined after J-SOX implementation. Meanwhile, in contrast to Gilliam et al. (2015), we show that the discontinuity in the earnings distribution at zero did not disappear after J-SOX implementation.

We offer two possible explanations for the different results between the United States and Japan. First, US-SOX may be more effective than J-SOX at reducing earnings management to avoid losses because it requires stricter procedures for internal control assessment than J-SOX. In other words, J-SOX may be unable to suppress earnings management to avoid losses because it was developed with significant emphasis on cost mitigation for internal control assessment. Second, as we describe in Section 6, Japanese firms could have stronger incentives to avoid losses than U.S. firms because they have features such as implicit earnings-based managers' compensation contracts, bank-oriented governance systems, and conformity between financial reporting and tax reporting (Suda and Shuto, 2007). These features may have led to the non-disappearance (disappearance) of the discontinuity in the earnings (earnings change) distribution at zero after J-SOX implementation.

The rest of this study is organized as follows. Section 2 develops the hypotheses. Section 3 describes the data, sample selection, and descriptive statistics. Section 4 reports the main results. Section 5 shows the results of the additional analysis. Section 6 concludes the study.

2. Background and hypotheses development

2.1. Differences between US-SOX and J-SOX

In Japan, many accounting scandals were exposed in the mid-2000s (e.g., Seibu Railway, Kanebo, and Livedoor). As a result, the Financial Services Agency of Japan required listed firms to self-inspect their financial statements. In January 2005, the Business Accounting Council of Japan decided to begin discussions on the development of standards for managers' assessments and auditors' audits of internal control over financial reporting. From February 2005, discussions were initiated by the Internal Control Committee of the Business Accounting Council. In particular, the Committee discussed the content of a workable standard based on the internal control standards in the United States and other countries as well as on Japanese business practices. In December 2005, the Committee published its "Draft Standards for Management Assessment and Audit concerning Internal Control Over Financial Reporting." The draft provided that the basic framework for internal control in Japan follows the framework stated in the Committee of Sponsoring Organizations of the Treadway Commission (COSO) report. In June 2006, the Japanese Diet passed the Financial Instruments and Exchange Act of 2006 (J-SOX). Finally, J-SOX came into effect for fiscal years starting in April 2008.

Since J-SOX is patterned after US-SOX, they share a number of common points. First, as with US-SOX, J-SOX aims to reinforce corporate governance in financial reporting. Second, they both regulate listed firms and follow the COSO Report framework. Third, both US-SOX and J-SOX require a manager's confirmation of the accuracy of the firm's financial statements and the assessment of the effectiveness of internal control over financial reporting. Finally, both impose legal penalties on managers for misreporting.

However, there are several important differences between US-SOX and J-SOX, too. Following the criticism that firms bear high costs under US-SOX, J-SOX was developed to ensure that the cost burden relating to managers' assessments and auditors' audits would not be excessive. As mentioned in Section 1, J-SOX has six measures that differ from US-SOX (Business Accounting Council, 2007). We presume that two of these six measures affect the differences between US-SOX and J-SOX regarding the effectiveness of internal control.

First, in contrast to US-SOX, J-SOX does not require direct reporting. Under US-SOX, the PCAOB Auditing Standard No. 2 (AS2) requires auditors to express two opinions on the effectiveness of internal control over financial reporting. One is the opinion on the manager's assessment of this effectiveness and the other is the opinion on the effectiveness itself (i.e., not the manager's assessment). The former is called indirect reporting and the latter is called direct reporting. Since fiscal years ending November 15, 2007, the PCAOB Auditing Standard No. 5 (AS5) has superseded AS2. Under AS5, indirect reporting is no longer required but direct reporting is still required. By contrast, under J-SOX, auditors are solely required to audit the manager's assessments of internal control (i.e., indirect reporting) and are not required to carry out direct reporting. The

direct reporting system allows auditors to directly evaluate the effectiveness of internal control over financial reporting without the intervention of self-evaluation by managers. Thus, such a system should lead to fairer audits and auditors should be more likely to discover misstatements in financial reporting. In addition, since direct reporting requires auditors to express their opinion on effectiveness itself, they must bear significant responsibility if their opinion is incorrect. Therefore, auditors are likely to audit firms' internal control stricter under US-SOX than under J-SOX.[5]

Second, US-SOX requires that internal control audits are performed by the audit firm that audits the firm's financial statements. By contrast, J-SOX requires that not only the audit firm, but also the engagement partners are the same. The integration of the internal control audit with the financial statement audit aims to achieve an effective and efficient audit by using the same audit evidence in both audits. However, if auditors who audit both internal controls and financial statements advise their client to improve internal control, such advice can correspond to a consulting service and the impairment of auditors' independence may be suspected. For this reason, US-SOX does not require that the same engagement partners audit both internal control and financial statements. These differences between US-SOX and J-SOX may lead to different effects on managers' earnings management activities.

2.2. Hypotheses development

J-SOX requires a manager's confirmation of financial statement accuracy, a manager's assessment of internal control and preparation of internal control reports, and external auditors' audit of internal control reports. In addition, it imposes penalties on managers for the misstatement of internal control reports. In this way, J-SOX is expected to improve the corporate governance of financial reporting through tighter regulations.

In addition, although the procedures required by J-SOX are more concise than those for US-SOX because of the emphasis on cost mitigation, it was also developed with emphasis on effective and efficient audit practice. For example, the Business Accounting Council (2007) states that since the audit evidence obtained through internal control audits and financial statement audits can be reciprocally utilized in the respective audits, effective and efficient audit practice may be ensured.

Given the tighter regulations for managers on financial reporting and the effective and efficient audit practice under J-SOX, managers' earnings management could decrease. As a result, we expect that the discontinuity in the earnings distribution for Japanese firms disappeared after J-SOX implementation, a situation that is the same as that experienced by U.S. firms (Gilliam et al., 2015).

[5] With regard to the approach for the evaluation of internal control over financial reporting, PCAOB (2005, p. 9) and SEC (2006, p. 32) report that, in the United States, although AS2 does not intend that auditors use a bottom-up approach, they frequently do so, as opposed to a top-down approach, as a result of the onerous AS2 requirements. Thus, it differs from Japan in which a top-down approach is used under J-SOX. However, since AS5 has been effective, the top-down approach has also now been mandated in the United States.

Thus, our first hypothesis is as follows.

H1: *There is no evidence of the discontinuity in the earnings distribution after J-SOX implementation*.

Prior studies show that the distributions of not only earnings but also earnings changes have discontinuity around zero (e.g., Burgstahler and Dichev, 1997; Degeorge et al., 1999; Suda and Shuto, 2007). In this regard, Gilliam et al. (2015) find that the discontinuity in the earnings change distribution at zero has declined but not disappeared completely since the passage of US-SOX. Consistent with Gilliam et al. (2015), we investigate whether the discontinuity in the earnings change distribution disappeared after J-SOX implementation. If earnings management decreased after J-SOX implementation, the discontinuity in the earnings change distribution is also likely to have disappeared. Consequently, our second hypothesis is as follows.

H2: *There is no evidence of the discontinuity in the earnings change distribution after J-SOX implementation*.

3. Data, sample selection, and descriptive statistics

The sample consists of Japanese listed firms with available data from *Nikkei-Needs Financial Quest*. We use annual data from consolidated financial statements over the period 2000 to 2013. Firms in regulated industries (Railways and Buses, Land Transport, Marine Transport, Air Transport, Communications, Electric Power, and Gas) and financial industries are excluded. We select firms that adopt Japanese accounting standards and firms with fiscal year-ends of March 31.[6] This approach yields 28,804 (27,512) firm-year observations in order to test the distribution of earnings (earnings changes). Since J-SOX was implemented from the fiscal years starting in April 2008, the fiscal year ending on March 31, 2009 was the first time that firms were required to apply J-SOX. Thus, we treat firms from 2000 to 2008 (from 2009 to 2013) as the pre-J-SOX (post-J-SOX) sample.

Table 1, Panel A (Panel B) shows the descriptive statistics for net income (change in net income) scaled by lagged total assets. In Panel A, on average, positive earnings are booked except for 2002 and 2009.[7] In Panel B, on average, we observe an earnings increase except for a relatively large

[6] Most Japanese listed firms have fiscal year-ends of March 31. For example, in 2013 these firms accounted for approximately 80% of all listed firms in terms of the market value of equity. We assume that these firms are representative of Japanese firms and are suitable as the population of Japanese firms for this research. In fact, many studies use Japanese firms with fiscal year-ends of March 31 (e.g., Ebihara et al., 2014; Herrmann et al., 2003; Kubota and Takehara, 2009; Shuto and Iwasaki, 2014; Shuto and Kitagawa, 2011; Shuto et al., 2009).

[7] Large negative earnings and earnings changes in 2009 might be due to the global financial crisis

earnings decline in 2002 and 2009 and a relatively small earnings decrease from 2006 to 2008.

Table 1 around here

4. Results

4.1. Pre- and post-J-SOX

Panels A and B of Figure 1 show the distribution of net income scaled by lagged total assets in the pre- and post-J-SOX periods, respectively. Following Roychowdhury (2006) and Gilliam et al. (2015), the distributions' interval widths are 0.005. The distribution has a discontinuity around zero in Panel A. The immediate left of zero is an unusually low frequency, while the immediate right of zero is an unusually high frequency. Following Beaver et al. (2007) and Gilliam et al. (2015), we compute the standardized differences to test the significance of the irregularity around zero.[8] The standardized difference for the interval immediately left of zero is significantly negative (-11.70) and for the interval immediately right of zero is significantly positive (6.33). This result suggests the existence of earnings management to avoid losses in the pre-J-SOX period.

Figure 1 around here

Panel B also shows a discontinuity around zero. The standardized difference for the interval immediately left of zero is significantly negative (-8.93) and for the interval immediately right of zero is significantly positive (4.01). Although the significance level decreases, the discontinuity in the earnings distribution persists in the post-J-SOX period. This result does not support H1 and indicates that Japanese managers engaged in earnings management to avoid losses even after J-SOX implementation. In contrast to Gilliam et al. (2015), who show that the discontinuity in the zero-earnings distribution has disappeared since the passage of US-SOX, we find no evidence of the disappearance of the discontinuity in the zero-earnings distribution after J-SOX implementation.

Panels A and B of Figure 2 show the distribution of the change in net income scaled by lagged total assets in pre- and post-J-SOX periods, respectively. Following Burgstahler and Dichev (1997), the distributions' interval widths are 0.0025. In Panel A, the immediate left of zero is an unusually low frequency and the immediate right of zero is an unusually high frequency. The standardized

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precipitated by the bankruptcy of Lehman Brothers. However, even if we exclude the 2009 sample, the results in this paper are similar.

[8] The standardized difference equals the difference between the actual and expected number of firms in an interval divided by the estimated standard deviation of the difference. The expected number of firms in an interval is the average of the two immediately adjacent intervals. Following Beaver et al. (2007) and Gilliam et al. (2015), we compute the variance as follows: $Np_i(1 - p_i) + (1/4)N(p_{i-1} + p_{i+1})(2 - p_{i-1} - p_{i+1})$, where N is the sum of the number of firms and p_i is the probability that a firm goes into interval i.

difference for the interval immediately left of zero is significantly negative (-2.71) and for the interval immediately right of zero is significantly positive (5.78). This finding provides evidence of the existence of earnings management to avoid earnings decreases in the pre-J-SOX period. However, in Panel B, there is no discontinuity around zero. The standardized difference for the interval immediately left of zero is insignificant (0.02) and for the interval immediately right of zero is also insignificant (1.25). This result supports H2 and indicates that earnings management to avoid earnings decreases was not used after J-SOX implementation.

Figure 2 around here

4.2. Analyses by year

In this subsection, following Gilliam et al. (2015), we divide the full sample into annual subsamples to confirm the intertemporal variation in the discontinuities of the earnings and earnings change distributions. If earnings management to avoid losses reduced after J-SOX implementation, the standardized differences for small loss (small profit) intervals in the earnings distribution should increase (decrease). Similarly, if earnings management to avoid earnings decreases reduced after J-SOX implementation, the standardized differences for small earnings decrease (small earnings increase) intervals in the earnings change distribution should increase (decrease).

Panel A of Table 2 presents the standardized differences for small loss and small profit with annual subsamples. The small loss standardized differences are all significantly negative from 2000 to 2008 and from 2009 to 2013. The small profit standardized differences are significantly positive from 2000 to 2003 and from 2009 to 2011. In sum, there is evidence of the discontinuity in the earnings distribution for both the pre- and the post-J-SOX periods even when we use annual subsamples.

Table 2 around here

Panel B of Table 2 shows the standardized differences for a small earnings decrease and a small earnings increase with annual subsamples. The standardized differences for a small earnings decrease are all insignificant from 2000 to 2013. However, the standardized differences for a small earnings increase from 2000 to 2008 are statistically significant for five years and insignificant for four years. Further, the standardized differences for a small earnings increase are insignificant from 2009 to 2013 except one (2011). These results suggest that the discontinuity in the earnings change distribution at zero almost disappeared after J-SOX implementation.

To statistically confirm whether the standardized differences significantly decreased after J-SOX implementation, we run the following time-trend regression:

$$ST\_DIFF_t = \alpha + \beta_1 Time + \beta_2 J\_SOX + \varepsilon_t \quad (1)$$

where *ST_DIFF* = the standardized differences for a small loss, small profit, small earnings decrease, or small earnings increase; *Time* = a trend variable equal to the difference between the current year and 2000; and *J_SOX* = a dummy variable that equals 1 if the year is from 2009 to 2013 and 0 otherwise. To control for the time series properties, we include *Time* as an independent variable. However, the correlation coefficient between *Time* and *J-SOX* is very high (0.832), which implies the possibility of multicollinearity. Thus, we also report the regression results without the *Time* variable.

Panels A and B of Table 3 present the regression results with and without the *Time* variable, respectively. In both panels, the left two columns show the results of the earnings distribution and the right two columns show the results of the earnings change distribution. If earnings management to avoid losses reduced after J-SOX implementation, the coefficients on *J_SOX* should be positive (negative) when *ST_DIFF* is a small loss (small profit) standardized difference. Similarly, if earnings management to avoid earnings decreases reduced after J-SOX implementation, the coefficients on *J_SOX* should be positive (negative) when *ST_DIFF* is a small earnings decrease (small earnings increase) standardized difference.

Table 3 around here

When the dependent variable is the standardized difference for a small loss (small profit), the coefficients on *J_SOX* are insignificant (significantly positive) in Panel A. They are also both insignificant in Panel B. These results indicate that earnings management to avoid losses did not reduce after J-SOX implementation. The results are also consistent with the non-disappearance of the discontinuity in the earnings distribution around zero after J-SOX implementation.[9]

When the dependent variable is the standardized difference for a small earnings decrease (small earnings increase), the coefficients on *J_SOX* are significantly positive (significantly negative) in Panels A and B. These results indicate that earnings management to avoid earnings decreases reduced after J-SOX implementation. The results are again consistent with the disappearance of the discontinuity in the earnings change distribution around zero after J-SOX implementation.

5. Additional analyses

[9] The result for small profit standardized differences in Panel A is consistent with the increase in the discontinuity in earnings distribution at zero in the post-J-SOX period. However, this evidence must be interpreted with some caution because the correlation coefficient between *Time* and *J-SOX* is very high.

5.1. Scaling

In our main analysis, we use total assets as a scaling measure for earnings and earnings changes. This is because total assets are most often used as a scaler in earnings distribution research for Japanese firms (Shuto, 2009; Shuto and Iwasaki, 2015; Suda and Shuto, 2007; Thomas et al., 2004; Yamaguchi, 2009). In addition, some research for U.S. firms uses total assets as a scaler for primary analysis (Roychowdhury, 2006) and additional analysis (Beaver et al., 2007; Burgstahler and Dichev, 1997; Durtschi and Easton, 2005; Gilliam et al., 2015). However, another standard scaler, the market value of equity, is also used in many studies (e.g., Beaver et al., 2007; Burgstahler and Dichev, 1997; Dechow et al., 2003, Durtschi and Easton, 2005, 2009; Gilliam et al., 2015). Thus, we show the results of the earnings and earnings change distributions scaled by the market value of equity.

Panels A and B of Figure 3 show the distribution of net income scaled by the lagged market value of equity in the pre- and post-J-SOX periods, respectively. In Panel A, the standardized difference for the interval immediately left of zero is significantly negative (-6.42) and for the interval immediately right of zero is significantly positive (2.58). In Panel B, although the standardized difference for the interval immediately right of zero is insignificant (1.30), the standardized difference for the interval immediately left of zero is still significantly negative (-4.31). Thus, the discontinuity in the earnings distribution still exists in the post-J-SOX period even when the market value of equity is used as a scaling measure.

Figure 3 around here

Panels A and B of Figure 4 show the distribution of the change in net income scaled by the lagged market value of equity in the pre- and post-J-SOX periods, respectively. In Panel A, the standardized difference for the interval immediately left of zero is significantly negative (-3.65) and for the interval immediately right of zero is significantly positive (3.04). In Panel B, the standardized difference for the interval immediately left of zero is insignificant (-1.00) and for the interval immediately right of zero is insignificant (1.56). Again, these findings suggest that the discontinuity in the earnings change distribution disappeared after J-SOX implementation.

Figure 4 around here

Although scaling earnings is often used and supported by earnings distribution research, it is also often cited as a concern regarding earnings distribution methodologies (Dechow et al., 2003; Durtschi and Easton, 2005, 2009).[10] For example, Durtschi and Easton (2005) show that scaling by firm size has a different effect on profit and loss firms and they assert that such scaling

[10] Please see Gilliam et al. (2015, pp. 8–9) for a summary of these disputes.

inappropriately causes the discontinuity in the earnings distribution. Thus, they advocate analyzing distributions of un-scaled earnings. In this regard, Burgstahler and Chuk (2015) point out that large firms are more likely to report large profits and losses. They also indicate that ignoring the effect of firm size systematically reduces the power of tests, thereby obscuring or eliminating evidence of discontinuities due to earnings management. Consequently, they recommend partitioning firms into quartiles based on firm size.

Thus, following Gilliam et al. (2015), we partition our pre- and post-J-SOX samples into quartiles based on firm size (lagged total assets and the lagged market value of equity). As with Burgstahler and Chuk (2015) and Gilliam et al. (2015), we use progressively wider interval widths for the quartiles with larger firms to control for the differences between small profits (losses) for large firms and small profits (losses) for small firms. We adopt the following interval widths for the earnings distribution: 60, 120, 300, and 900 million yen for the first, second, third, and fourth quartiles, respectively. In accordance with our main analysis, we use half-interval widths of the earnings distribution for the earnings change distribution, namely 30, 60, 150, and 450 million yen for the first, second, third, and fourth quartiles, respectively. Following Gilliam et al. (2015), we restrict the pre-J-SOX sample to 2004–2008 to ensure the comparability of sample size and statistical test power between the pre- and post-J-SOX samples.[11]

Table 4 presents the results of the un-scaled earnings distribution. Panel A shows the results for each quartile based on lagged total assets and time period. With regard to the pre-J-SOX period, the small loss standardized differences are all significantly negative and two of the four small profit standardized differences are significantly positive. Further, in the post-J-SOX period, the small loss standardized differences are all significantly negative and one of the four small profit standardized differences is significantly positive. Panel B of Table 4 shows small loss and profit standardized differences for each quartile based on the lagged market value of equity and time period. The results are similar to those with quartiles based on lagged total assets. Overall, even when we construct an un-scaled earnings distribution, the results indicate that the discontinuity in the earnings distribution at zero did not disappear after J-SOX implementation.

Table 4 around here

Table 5 presents the results of the un-scaled earnings change distribution. Panel A shows the results for each quartile based on lagged total assets and time period. With regard to the pre-J-SOX period, although the standardized differences for a small earnings decrease are all insignificant, three of the four standardized differences for a small earnings increase are significantly positive. For the

[11] The results are essentially the same even when the sample for 2000–2008 is used as the pre-J-SOX sample.

post-J-SOX period, the standardized differences for a small earnings decrease and small earnings increase are not significant. Panel B shows the results for each quartile based on the lagged market value of equity and time period. We find two significantly negative standardized differences for a small earnings decrease in the pre-J-SOX period but no significantly negative (positive) standardized differences for a small earnings decrease (small earnings increase) in the post-J-SOX period. In sum, even when we use an un-scaled earnings change distribution, the results indicate that the discontinuity in the earnings change distribution at zero disappeared after J-SOX implementation.

Table 5 around here

5.2. Distributions using the constant pre- and post-J-SOX samples

In our main analysis, we use all firm-years with the available data. However, the discontinuity in distributions may have been diminished by changes in sample composition between the pre- and post-J-SOX periods. For example, some firms drop out of the sample each year because of delisting, such as mergers and acquisitions, going private, and bankruptcy. Additionally, other firms may join the sample because of initial public offerings. To check the sensitivity of our main results to these changes in sample composition, we use a constant sample and reconstruct the distributions of earnings and earnings changes. In particular, following Gilliam et al. (2015), we use a subsample of firms with data for five years that center on 2009 (the year of J-SOX implementation) and produce distributions from 2007 to 2008 and from 2010 to 2011.

Figure 5 displays the distribution of net income scaled by lagged total assets with constant pre- and post-J-SOX samples. In Panel A, for the pre-J-SOX period, the small loss standardized difference is significantly negative (-3.62) and the small profit standardized difference is not significant (-0.29). In Panel B, for the post-J-SOX period, the small loss standardized difference is significantly negative (-6.32) and the small profit standardized difference is significantly positive (3.74). These results suggest that the discontinuity in the earnings distribution did not disappear after J-SOX implementation.

Figure 5 around here

Figure 6 displays the distribution of the change in net income scaled by lagged total assets with constant pre- and post-J-SOX samples. In Panel A, for the pre-J-SOX period, the standardized difference for small earnings decreases is insignificant (-1.63) and the standardized difference for small earnings increases is significantly positive (3.36). In Panel B, for the post-J-SOX period, the standardized differences for small earnings decreases and small earnings increases are both

insignificant (-0.17 and 0.51, respectively). Again, these results suggest that the discontinuity in the earnings change distribution disappeared after J-SOX implementation.

Figure 6 around here

Overall, these results suggest that the sample composition does not explain the non-disappearance (disappearance) of the discontinuity in the earnings (earnings change) distribution around zero.

5.3. Earnings histories and the distributions of earnings and earnings changes

Prior research shows that firms with consecutive years of avoiding losses and earnings decreases are rewarded; however, they are penalized severely by the stock market when they report earnings declines. For example, DeAngelo et al. (1996) report that firms experience negative abnormal stock returns in the year in which they report an earnings decline after reporting consistent earnings increases for several years. Burgstahler and Dichev (1997) indicate that firms with longer histories of avoiding losses have greater incentives to keep avoiding losses. Barth et al. (1999) document that firms with consecutive years of increasing earnings have higher price-earnings multiples than other firms and that these multiples decrease significantly when earnings decrease.

Based on such research, Gilliam et al. (2015) investigate whether the disappearance of the discontinuity in the earnings distribution at zero since the passage of US-SOX has been influenced by the strength of incentives to manage earnings to avoid losses. They show a zero-earnings discontinuity only for firms with long histories (three years or more) of positive earnings, even since the passage of US-SOX.

In Section 4, we find evidence that the discontinuity in the earnings change distribution at zero disappeared after J-SOX implementation. Thus, in this section, we assess whether the disappearance of the discontinuity in the earnings change distribution after J-SOX implementation was influenced by the strength of incentives to manage earnings to avoid earnings decreases. Although we find no evidence of the disappearance of the discontinuity in the earnings distribution at zero, for comparison purposes, we also assess whether the discontinuity in the earnings distribution after J-SOX implementation was influenced by the strength of incentives to manage earnings to avoid losses.

Following Burgstahler and Dichev (1997) and Gilliam et al. (2015), we divide firms into three groups according to their histories of earnings (earnings changes): (1) a loss (earnings decrease) in the prior year, (2) positive earnings (earnings increases) in the prior one or two consecutive years, and (3) positive earnings (earnings increases) in the most recent three or more consecutive years. We assume that firm-years in group 3 have the strongest incentive to avoid losses (earnings decreases). Then, we calculate the standardized differences around zero in the distribution of earnings (earnings

changes) for each these groups in both the pre- and the post-J-SOX periods.

Panel A of Table 6 reports the results for the history of earnings. Regardless of the earnings history group, the discontinuity in the earnings distribution around zero can be observed in both the pre- and the post-J-SOX periods. Consistent with the results in Figure 1, these findings indicate that earnings management to avoid losses was pervasive both before and after J-SOX implementation.

Table 6 around here

Panel B of Table 6 reports the results for the history of earnings changes. In the pre-J-SOX period, the standardized differences for a small earnings decrease are significantly negative only in group 3 and the standardized differences for a small earnings increase are significantly positive in groups 2 and 3. Meanwhile, in the post-J-SOX period, none of the standardized differences for any of the earnings histories is statistically significant. These results indicate that the discontinuity in the earnings change distribution in the pre-J-SOX period was caused by habitual beaters but that earnings management by habitual beaters to avoid earnings decreases was less prevalent in the post-J-SOX period.

6. Conclusion

This study investigates whether the discontinuity in the distributions of earnings and earnings changes disappeared after J-SOX implementation. We find that the discontinuity in the earnings change distribution at zero almost disappeared after J-SOX implementation, indicating that earnings management to avoid earnings decreases became less prevalent. In addition, the results indicate that the discontinuity in the earnings change distribution before J-SOX implementation was mainly caused by habitual beaters and that earnings management by habitual beaters to avoid earnings decreases was less prevalent after J-SOX implementation. However, in contrast to US-SOX, the results also indicate that the discontinuity in the earnings distribution at zero did not disappear after J-SOX implementation.

We offer two possible reasons for the different results between the United States and Japan. First, US-SOX may be more effective than J-SOX at reducing earnings management to avoid losses. J-SOX was developed to ensure that the cost burden relating to managers' assessments and auditors' audits would not be excessive and therefore it has several differences from US-SOX. For example, in contrast to US-SOX, which requires auditors to evaluate internal control directly, J-SOX only requires auditors to audit the results of managerial assessments of internal control. Thus, under J-SOX, managers have less pressure from auditors with regard to internal control. As a result, the corporate governance of Japanese firms would not be sufficiently improved and managers could

continue to engage in earnings management to avoid losses.

Second, Japanese firms may have relatively strong incentives to avoid losses. According to Suda and Shuto (2007), Japanese firms are more likely to manage earnings to meet or slightly beat zero earnings than U.S. firms for three reasons: (1) the implicit earnings-based contracts of managers' compensation, (2) bank-oriented governance systems, and (3) earnings management for tax purposes.

Specifically, in contrast to U.S. firms that typically have lower and upper limits of earnings for use in bonus contracts (Healy, 1985), Japanese firms generally do not have explicit contracts of earnings-based compensation with managers (Kay, 1997). However, prior studies find a significant correlation between managers' compensation and the profitability of Japanese firms, suggesting implicit earnings-based compensation contracts (e.g., Kaplan, 1994). Japanese firms are likely to focus on a single earnings target such as zero earnings to compute managers' compensation because they use implicit earnings-based compensation contracts. Indeed, Kaplan (1994) indicates that managers' compensation and turnover in Japan are more sensitive to negative earnings than they are in the United States. Thus, Japanese managers could have a stronger incentive to avoid losses than U.S. managers in order to increase their compensation and avoid turnover.

The governance system of Japanese firms is often viewed as bank-oriented (Kang and Shivdasani, 1999).[12] Most Japanese firms obtain a substantial fraction of debt financing from a single commercial bank called a main bank. Such main banks perform important monitoring roles in Japanese firms. In addition, in the case of a drastic financial decline that becomes a loss, a main bank interposes directly (Aoki, 1994). For example, top management is forced to leave and a management team is dispatched from the main bank. Thus, Japanese managers could have a stronger incentive to avoid losses than U.S. managers to avoid direct intervention by a main bank.

In contrast to U.S. firms, Japanese firms are required to ensure conformity between financial reporting and tax reporting. Thus, Japanese firms could prefer small profits to large profits to minimize current tax payments. This situation may lead to relatively large numbers of observations just above zero earnings in the distribution of earnings.

Overall, our results suggest that J-SOX has been successful to some extent, given that earnings management to avoid earnings decreases declined after J-SOX implementation. However, our results also suggest that earnings management to avoid losses did not decline after J-SOX implementation. As previously mentioned, J-SOX was developed with significant emphasis on cost-effectiveness. As a result, it may be unable to completely improve corporate governance and thus unable to suppress earnings management to avoid losses for Japanese firms that tend to have relatively strong incentives

[12] In the United States, important governance systems include incentive compensation contracts such as stock option plans; direct management equity ownership; monitoring by large shareholders; external capital markets; external members on the boards of directors; and external forces such as hostile takeovers and proxy contests (Kang and Shivdasani, 1999).

to avoid losses. Considering that accounting scandals such as that of the Toshiba Corporation have emerged even after J-SOX implementation, there appears to be some room for improvement.[13]

This study has three important limitations. First, although it provides evidence of a decline in *total* earnings management to avoid earnings decreases, certain types of earnings management methods (i.e., accrual-based and real earnings management) are excluded from the research.[14] Second, this study reports different results from those of the United States. In this regard, we discuss the differences between US-SOX and J-SOX and the differences in earnings management incentives between U.S. firms and Japanese firms. However, this study does not identify the factors that induce the differences in the results between the United States and Japan. Thus, we need to analyze the factors that cause such differences. Third, the passage of J-SOX was not the only important event occurring during our study period that may have affected the discontinuity. Examples include the Companies Act implemented in 2006, the revision of accounting standards for the measurement of inventories and financial instruments in 2008, and the bankruptcy of Lehman Brothers in 2009. Thus, we do not rule out the possibility that factors other than J-SOX affected the discontinuity. These problems could be resolved in future studies.

[13] According to the July 20, 2015 issue of the *New York Times*, Toshiba overstated its earnings by more than 151 billion yen (1.2 billion dollars at the current exchange rate) over a seven-year period beginning in 2008. Further, managers across Toshiba's many divisions had implicit pressure to meet increasingly difficult profit goals imposed by their superiors (Soble, 2015). The June 12, 2015 issue of the *Nihon Keizai Shimbun* states that although Toshiba had deficiencies in its internal control systems, it reported in its 2014 internal control report that its internal controls were effective. Further, the auditors (Ernst & Young ShinNihon) expressed an opinion that the internal control report was fairly stated, resulting in the correction of the report (Nikkei Inc., 2015).

[14] For example, Cohen et al. (2008) show that since the passage of US-SOX, accrual-based earnings management has declined, while real earnings management has increased. In a recent cross-country study, Francis et al. (2016) indicate that a strong legal system decreases accrual-based earnings management but increases real earnings management.

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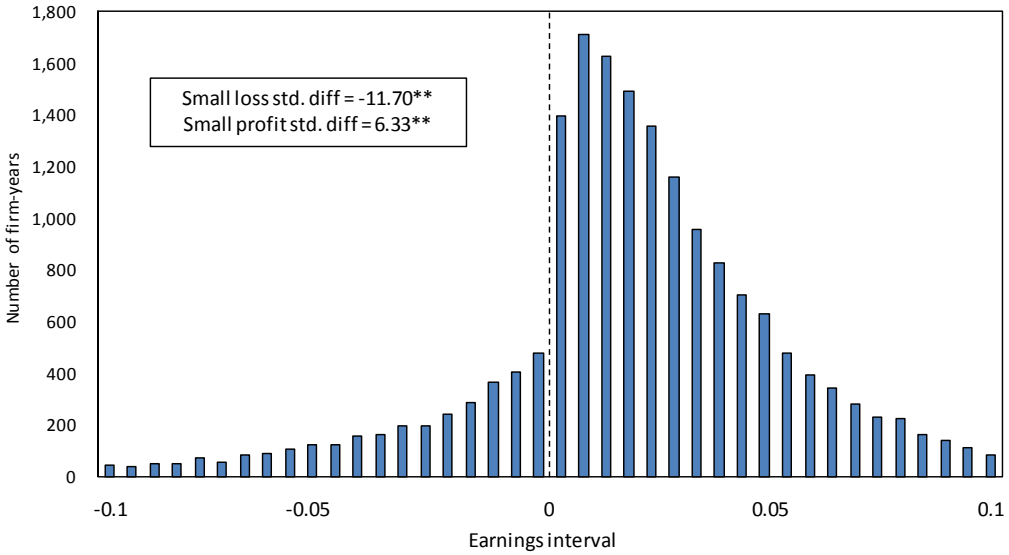
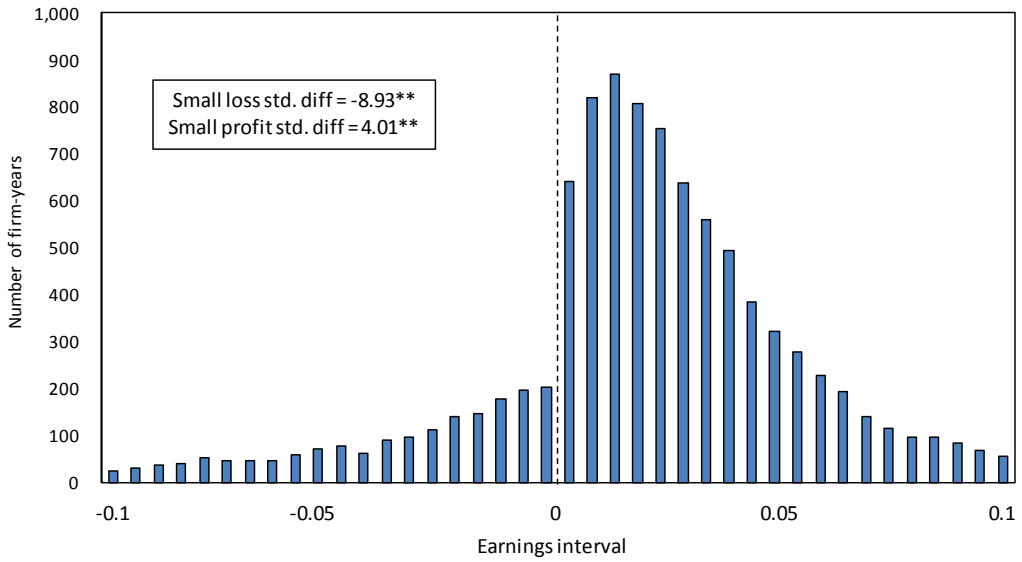
Figure 1 Distributions of net income scaled by lagged total assets

Panel A: Pre-J-SOX (2000–2008)



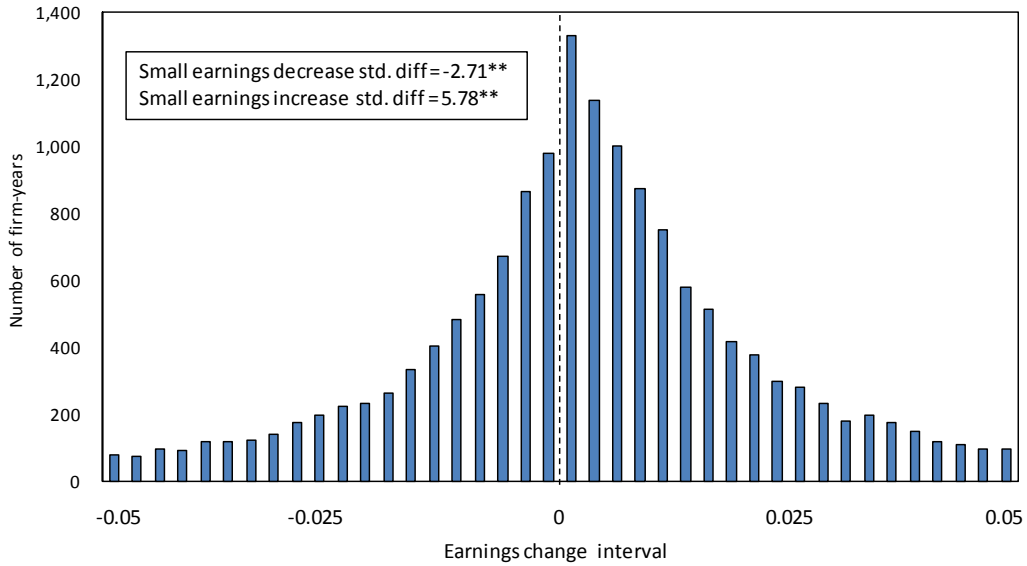
Panel B: Post-J-SOX (2009–2013)



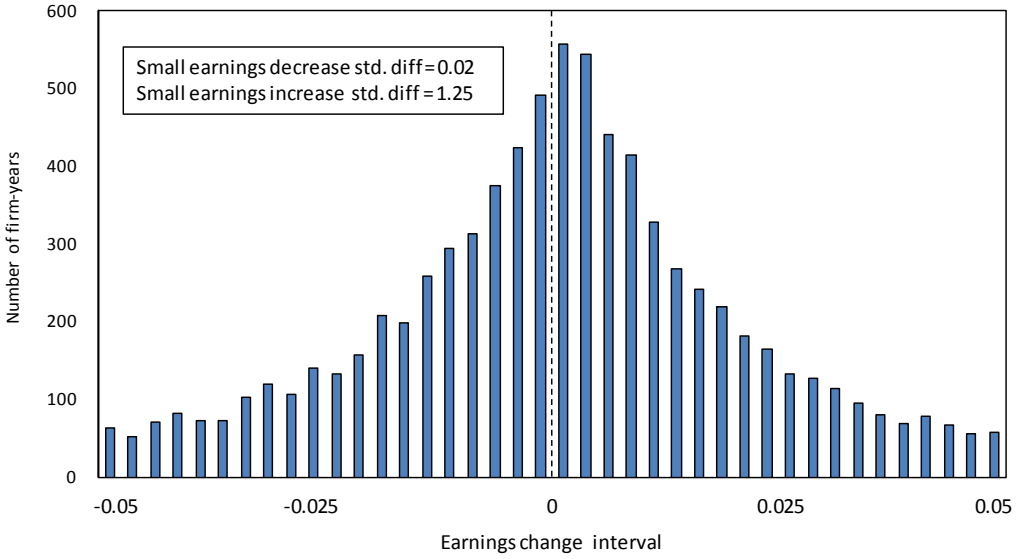
Notes: In Panel A (Panel B), 18,787 (10,017) firm-years over the period 2000–2008 (2009–2013) are classified into earnings intervals, where earnings are defined as net income scaled by lagged total assets. The distributions range from -0.1 to +0.1 and each interval width is 0.005. Panel A (Panel B) has 17,598 (9,383) firm-years because of the cutoff at both ends. **Significant at the 1% level (one-tailed).

Figure 2 Distributions of the change in net income scaled by lagged total assets

Panel A: Pre-J-SOX (2000–2008)



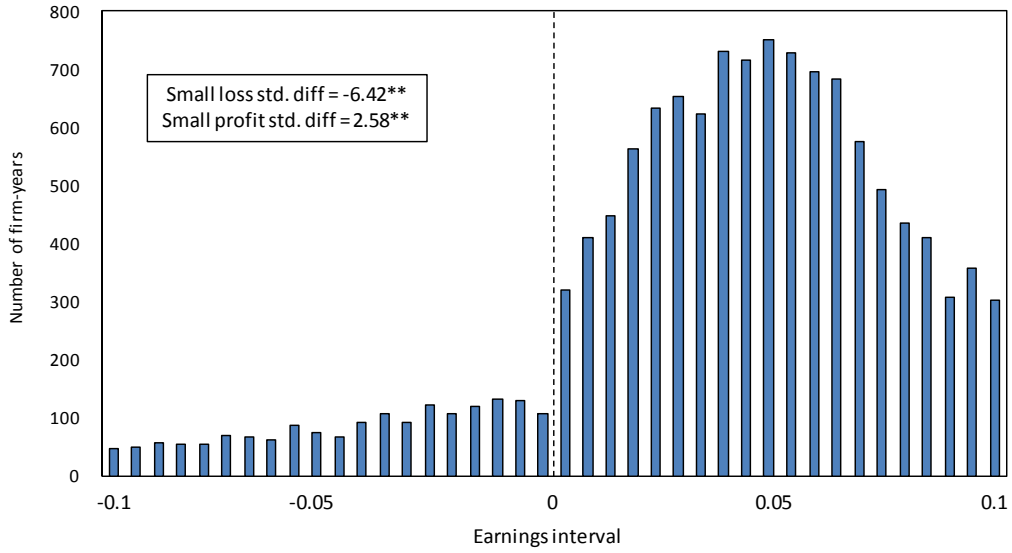
Panel B: Post-J-SOX (2009–2013)



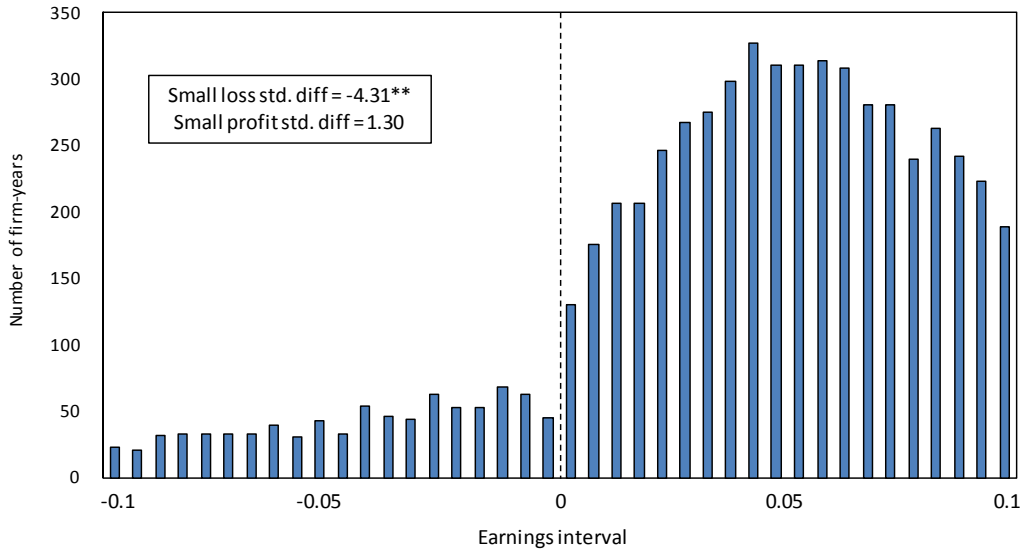
Notes: In Panel A (Panel B), 17,726 (9,786) firm-years over the period 2000–2008 (2009–2013) are classified into earnings change intervals, where earnings changes are defined as change in net income scaled by lagged total assets. The distributions range from -0.05 to +0.05 and each interval width is 0.0025. Panel A (Panel B) includes 15,158 (7,977) firm-years because of the cutoff at both ends. **Significant at the 1% level (one-tailed).

Figure 3 Distributions of net income scaled by the lagged market value of equity

Panel A: Pre-J-SOX (2000–2008)



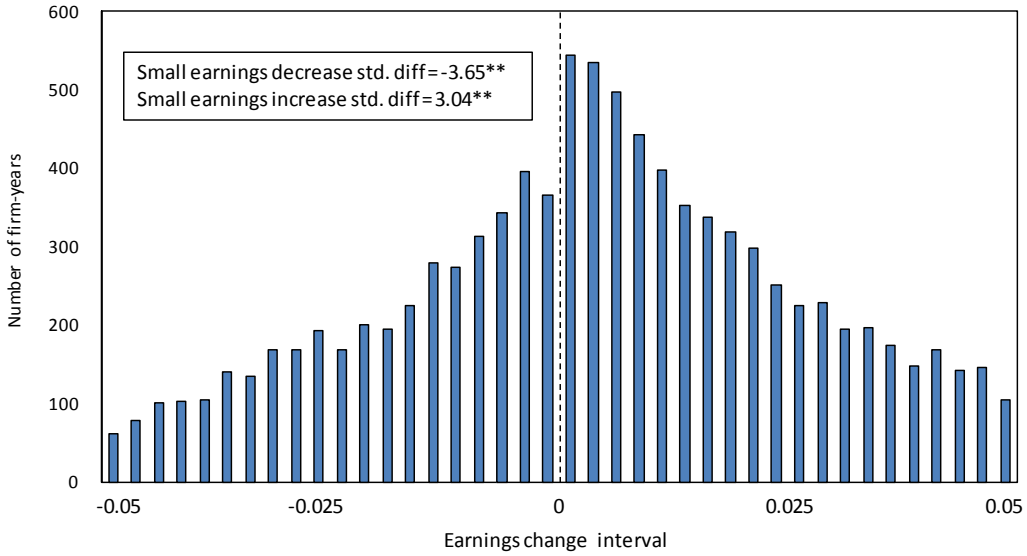
Panel B: Post-J-SOX (2009–2013)



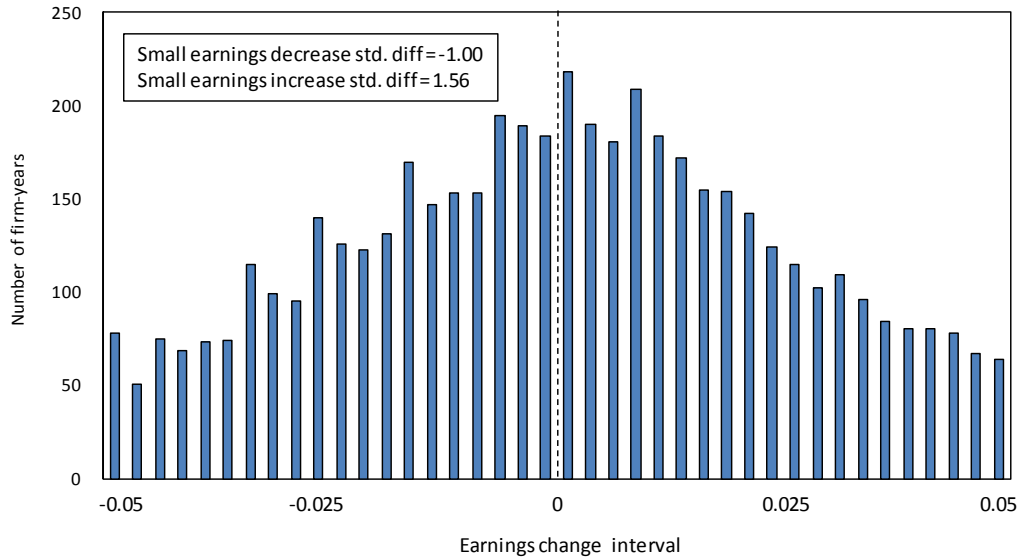
Notes: In Panel A (Panel B), 16,852 (9,430) firm-years over the period 2000–2008 (2009–2013) are classified into earnings intervals, where earnings are defined as net income scaled by the lagged market value of equity. The distributions range from -0.1 to +0.1 and each interval width is 0.005. Panel A (Panel B) has 12,530 (5,931) firm-years because of the cutoff at both ends. **Significant at the 1% level (one-tailed).

Figure 4 Distributions of the change in net income scaled by the lagged market value of equity

Panel A: Pre-J-SOX (2000–2008)



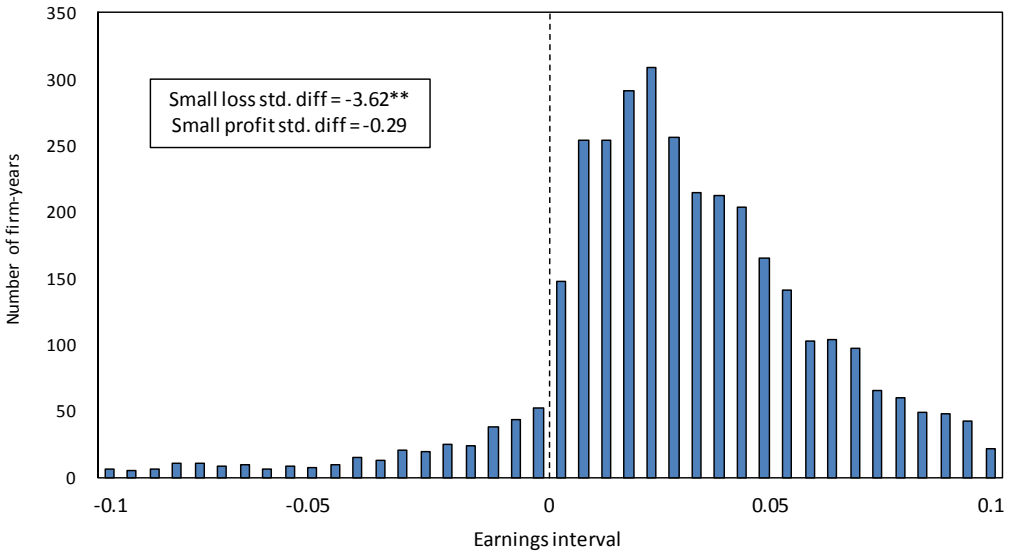
Panel B: Post-J-SOX (2009–2013)



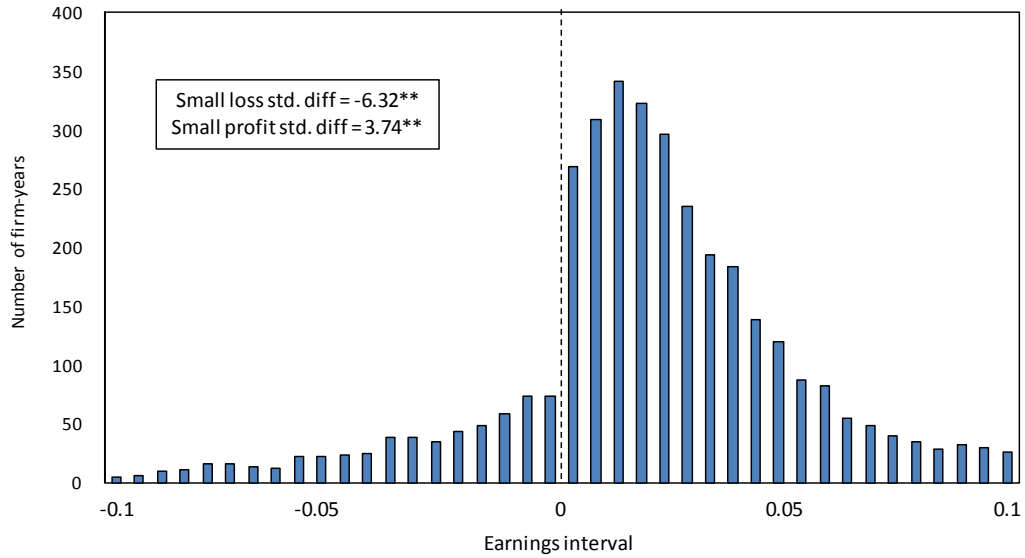
Notes: In Panel A (Panel B), 15,882 (9,224) firm-years over the period 2000–2008 (2009–2013) are classified into earnings change intervals, where earnings changes are defined as change in net income scaled by the lagged market value of equity. The distributions range from -0.05 to +0.05 and each interval width is 0.0025. Panel A (Panel B) includes 9,717 (5,044) firm-years because of the cutoff at both ends. **Significant at the 1% level (one-tailed).

Figure 5 Distributions of net income scaled by lagged total assets with a constant pre- to post-J-SOX sample

Panel A: Pre-J-SOX (2007–2008)



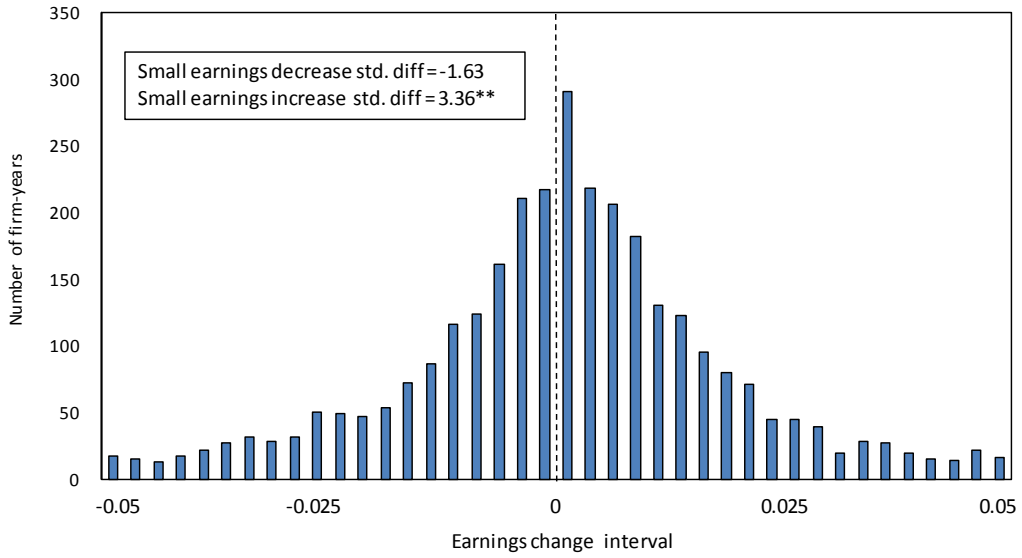
Panel B: Post-J-SOX (2010–2011)



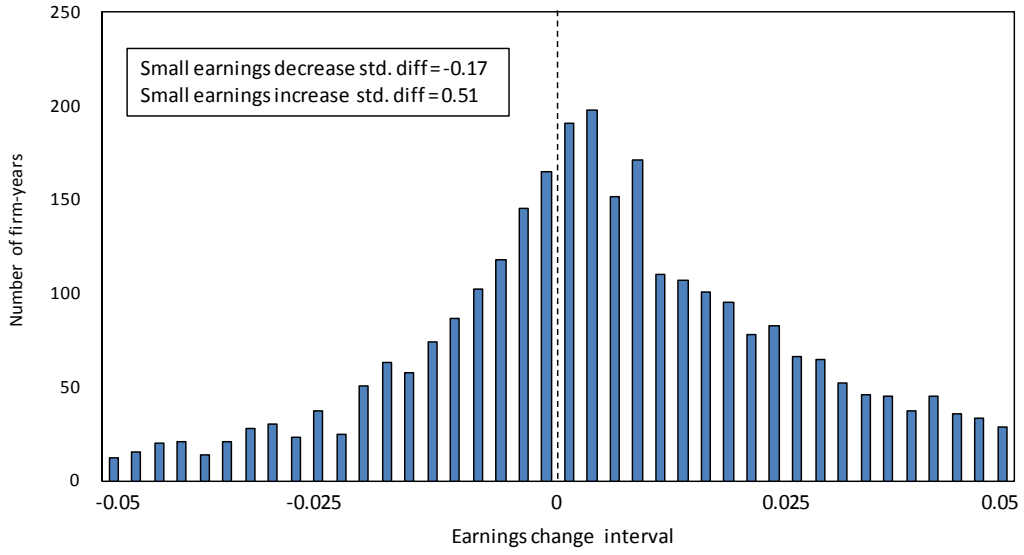
Notes: In Panel A (Panel B), 3,628 (3,628) firm-years over the period 2007–2008 (2010–2011) are classified into earnings intervals, where earnings are defined as net income scaled by lagged total assets. The distributions range from -0.1 to +0.1 and each interval width is 0.005. Panel A (Panel B) has 3,373 (3,461) firm-years because of the cutoff at both ends. **Significant at the 1% level (one-tailed).

Figure 6 Distributions of the change in net income scaled by lagged total assets with a constant pre- to post-J-SOX sample

Panel A: Pre-J-SOX (2007–2008)



Panel B: Post-J-SOX (2010–2011)



Notes: In Panel A (Panel B), 3,482 (3,482) firm-years over the period 2007–2008 (2010–2011) are classified into earnings change intervals, where earnings changes are defined as change in net income scaled by lagged total assets. The distributions range from -0.05 to +0.05 and each interval width is 0.0025. Panel A (Panel B) includes 3,091 (2,849) firm-years because of the cutoff at both ends. **Significant at the 1% level (one-tailed).

Table 1 Descriptive statistics

Panel A: Net income scaled by lagged total assets				Panel B: Change in net income scaled by lagged total assets			
Year	*N*	Mean	Median	Year	*N*	Mean	Median
2000	1,815	0.010	0.012	2000	1,692	0.006	0.005
2001	2,070	0.010	0.011	2001	1,777	0.003	0.002
2002	2,087	-0.001	0.006	2002	2,002	-0.011	-0.004
2003	2,083	0.006	0.010	2003	2,009	0.006	0.003
2004	2,094	0.019	0.019	2004	1,994	0.013	0.008
2005	2,129	0.025	0.024	2005	2,023	0.007	0.005
2006	2,160	0.025	0.027	2006	2,057	-0.002	0.003
2007	2,196	0.027	0.028	2007	2,098	-0.003	0.004
2008	2,153	0.017	0.024	2008	2,074	-0.008	-0.002
2009	2,100	-0.009	0.007	2009	2,057	-0.024	-0.017
2010	2,039	0.009	0.014	2010	1,993	0.017	0.007
2011	1,987	0.022	0.022	2011	1,944	0.014	0.006
2012	1,944	0.025	0.023	2012	1,904	0.004	0.001
2013	1,947	0.027	0.026	2013	1,888	0.002	0.004
Total	28,804	0.015	0.018	Total	27,512	0.001	0.002

Table 2 Tests of the discontinuity around zero in the annual distributions of earnings and earnings changes

Panel A: Standardized differences around zero in the annual distributions of earnings

Year	*N*	Small loss standardized differences	Small profit standardized differences
2000	1,815	-5.09**	3.95**
2001	2,070	-3.65**	2.81**
2002	2,087	-3.64**	4.67**
2003	2,083	-4.46**	4.39**
2004	2,094	-5.02**	0.59
2005	2,129	-4.30**	0.70
2006	2,160	-2.51**	-1.21
2007	2,196	-4.02**	0.39
2008	2,153	-2.94**	0.54
2009	2,100	-3.50**	2.33**
2010	2,039	-3.76**	2.11*
2011	1,987	-5.19**	3.19**
2012	1,944	-3.65**	0.21
2013	1,947	-4.26**	0.92
Total	28,804	-14.69**	7.48**

Panel B: Standardized differences around zero in the annual distributions of earnings changes

Year	*N*	Small earnings decrease standardized differences	Small earnings increase standardized differences
2000	1,692	-0.70	2.31*
2001	1,777	0.07	1.32
2002	2,002	-0.35	2.50**
2003	2,009	-0.76	1.29
2004	1,994	-1.62	2.16*
2005	2,023	-1.55	1.52
2006	2,057	-0.96	1.36
2007	2,098	-1.12	2.55**
2008	2,074	-1.08	2.34**
2009	2,057	0.20	0.73
2010	1,993	0.89	-0.60
2011	1,944	-1.32	1.78*
2012	1,904	1.08	-0.26
2013	1,888	-0.81	1.11
Total	27,512	-2.22*	5.49**

Notes: Earnings (earnings changes) are net income (change in net income) scaled by lagged total assets. Interval widths are 0.005 (0.0025) for the distribution of earnings (earnings changes). ** and * are statistically significant at the 1% and 5% levels (one-tailed), respectively.

Table 3 Regression results of the effect of J-SOX on the standardized differences at zero in the earnings and earnings change distributions

Panel A: The results of regressions with the time-trend term

	Small loss standardized differences	Small profit standardized differences	Small earnings decrease standardized differences	Small earnings increase standardized differences
Intercept	-4.445***	4.217***	-0.386	1.764***
	(-9.58)	(5.76)	(-0.93)	(4.08)
Time	0.121	-0.587***	-0.128	0.041
	(1.28)	(-3.91)	(-1.50)	(0.46)
J_SOX	-0.963	3.989***	1.798**	-1.662**
	(-1.20)	(3.16)	(2.51)	(-2.23)
R^2	0.133	0.582	0.403	0.505

Panel B: The results of regressions without the time-trend term

	Small loss standardized differences	Small profit standardized differences	Small earnings decrease standardized differences	Small earnings increase standardized differences
Intercept	-3.959***	1.870**	-0.897***	1.928***
	(-14.55)	(3.02)	(-3.59)	(8.05)
J_SOX	-0.113	-0.118	0.905*	-1.376***
	(-0.25)	(-0.11)	(2.17)	(-3.44)
R^2	0.005	0.001	0.281	0.496

Notes: N = 14. *ST_DIFF* = the standardized differences for a small loss, small profit, small earnings decrease, or small earnings increase; *Time* = a trend variable equal to the difference between the current year and 2000; *J_SOX* = a dummy variable that equals 1 if the year is from 2009 to 2013 and 0 otherwise. Earnings (earnings changes) are net income (change in net income) scaled by lagged total assets. Interval widths are 0.005 (0.0025) for the distribution of earnings (earnings changes). ***, **, and * are statistically significant at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 4 Tests of the discontinuity at zero in the un-scaled earnings distribution

Panel A: Quartiles based on lagged total assets

	Pre-J-SOX (2004–2008)				Post-J-SOX (2009–2013)			
	N	Average total assets	Small loss standardized differences	Small profit standardized differences	*N*	Average total assets	Small loss standardized differences	Small profit standardized differences
Quartile 1	2,683	8,965	-4.97**	2.14*	2,505	8,396	-6.38**	4.25**
Quartile 2	2,683	25,235	-3.97**	0.77	2,504	25,686	-3.19**	-0.19
Quartile 3	2,683	61,507	-4.48**	-0.61	2,504	65,779	-3.83**	0.36
Quartile 4	2,683	482,367	-5.06**	1.84*	2,504	570,042	-4.72**	1.40

Panel B: Quartiles based on the lagged market value of equity

	Pre-J-SOX (2004–2008)				Post-J-SOX (2009–2013)			
	N	Average market value	Small loss standardized differences	Small profit standardized differences	*N*	Average market value	Small loss standardized differences	Small profit standardized differences
Quartile 1	2,419	3,570	-4.37**	1.80*	2,358	2,308	-5.92**	4.63**
Quartile 2	2,419	11,258	-3.24**	1.16	2,357	7,460	-2.01*	-0.10
Quartile 3	2,419	31,712	-3.35**	-0.56	2,358	23,045	-3.74**	0.95
Quartile 4	2,419	331,096	-2.52**	1.15	2,357	272,979	-3.28**	-0.76

Notes: Average total assets and market values are in millions of yen. The interval widths for the earnings distribution are 60, 120, 300, and 900 million yen for the first, second, third, and fourth quartiles, respectively. ** and * are statistically significant at the 1% and 5% levels (one-tailed), respectively.

Table 5 Tests of the discontinuity at zero in the un-scaled earnings change distribution

Panel A: Quartiles based on lagged total assets

	Pre-J-SOX (2004–2008)				Post-J-SOX (2009–2013)			
	N	Average total assets	Small earnings decrease standardized differences	Small earnings increase standardized differences	*N*	Average total assets	Small earnings decrease standardized differences	Small earnings increase standardized differences
Quartile 1	2,552	9,320	-0.99	1.91*	2,439	8,804	-1.00	1.40
Quartile 2	2,565	25,648	-1.35	1.20	2,449	26,459	-0.49	0.35
Quartile 3	2,566	61,610	-0.94	1.67*	2,450	67,443	0.52	0.57
Quartile 4	2,563	468,561	-1.06	2.06*	2,448	576,953	0.41	1.62

Panel B: Quartiles based on the lagged market value of equity

	Pre-J-SOX (2004–2008)				Post-J-SOX (2009–2013)			
	N	Average market value	Small earnings decrease standardized differences	Small earnings increase standardized differences	*N*	Average market value	Small earnings decrease standardized differences	Small earnings increase standardized differences
Quartile 1	2,300	3,191	-0.52	1.05	2,297	2,611	-0.66	0.74
Quartile 2	2,307	10,089	0.07	0.65	2,309	8,511	-1.33	0.91
Quartile 3	2,310	28,585	-1.62	2.72**	2,308	26,427	2.66	-0.74
Quartile 4	2,311	292,508	-1.40	2.89**	2,310	318,966	0.70	0.68

Notes: Average total assets and market values are in millions of yen. The interval widths for the earnings change distribution are 30, 60, 150, and 450 million yen for the first, second, third, and fourth quartiles, respectively. ** and * are statistically significant at the 1% and 5% levels (one-tailed), respectively.

Table 6 The effect of the history of achieving earnings benchmarks on earnings management in the pre- and post-J-SOX periods

Panel A: Tests of the discontinuity at zero in the earnings distributions by earnings history

	Pre-J-SOX (2000–2008)			Post-J-SOX (2009–2013)		
	N	Small loss standardized differences	Small profit standardized differences	*N*	Small loss standardized differences	Small profit standardized differences
(1) Year subsequent to a loss	3,038	-4.92**	5.55**	1,978	-4.05**	3.01**
(2) Year subsequent to 1 or 2 years of positive earnings	1,412	-4.07**	1.48	821	-2.48**	0.85
(3) Year subsequent to 3 or more years of positive earnings	8,750	-6.58**	1.02	5,741	-6.23**	2.10*

Panel B: Tests of the discontinuity at zero in the earnings change distributions by earnings change history

	Pre-J-SOX (2000–2008)			Post-J-SOX (2009–2013)		
	N	Small earnings decrease standardized differences	Small earnings increase standardized differences	*N*	Small earnings decrease standardized differences	Small earnings increase standardized differences
(1) Year subsequent to an earnings decrease	5,113	0.90	1.03	4,666	0.55	0.14
(2) Year subsequent to 1 or 2 years of positive earnings changes	2,028	-0.92	1.81*	1,288	0.41	0.20
(3) Year subsequent to 3 or more years of positive earnings changes	2,178	-4.18**	3.65**	910	1.06	-0.72

Notes: Earnings (earnings changes) are net income (change in net income) scaled by lagged total assets. Interval widths are 0.005 (0.0025) for the distribution of earnings (earnings changes). ** and * are statistically significant at the 1% and 5% levels (one-tailed), respectively.