DOES BOOK-TAX DIFFERENCE INFLUENCE THE VALUE RELEVANCE OF BOOK INCOME? EMPIRICAL EVIDENCE FROM JAPAN

Akihiro Yamada, Chuo University

ABSTRACT

This paper analyzes the effects of the book-tax difference (BTD) on accounting accruals and value relevance. Recent studies argued that book-tax conformity increases earnings quality. However, other studies argued that book-tax conformity decreases earnings quality. The previous studies failed to isolate the components of BTD, and they did not consider the design of the operation of accounting or tax systems, which is the reason for the conflicting results. This paper isolates the elements of BTD and compares these elements and similar items. In addition, this paper focuses on the timing of changing accounting and tax systems. We predict and find that (1) large discretionary book-only accruals (DBOA) reduce the value relevance of earnings, (2) the value relevance of firms with large non-discretionary book-only accruals (NBOA) are higher than other firms. However, this result is not clear from a comparison of the value relevance of firms with large non-discretionary book-tax accruals (NBTA), and (3) the relationship between BTD and value relevance depends on the accounting system and the taxation system.

INTRODUCTION

This paper analyzes the effects of the book-tax difference (BTD) on accounting accruals and value relevance. In 1999, the US Treasury (US Department of the Treasury, 1999) noted increasing differences between reported income and taxable earnings. The issue of BTD has since been widely debated in the United States. BTD also attracted attention in Japan, where problems developed with respect to the strong relationship between individual financial statements and taxable income and the treatment of individual financial statements under International Financial Reporting Standards (IFRS).

The Japanese tax system had been designed with conforming book income and taxable income until around the year 2000. This book-tax system design contributes to reducing costs for taxpayers and tax authorities; for example, the costs of tax income recalculation for the taxpayer and the costs of tax inspections for tax authorities. However, one of the purposes of a tax system is to implement fair taxation. This purpose differs from that of financial accounting systems, which provide information to investors. Around the year 2000, financial accounting systems were rapidly changed to harmonize with IFRS (or International Accounting Standards: IAS). Because these new rules require the provision of information to investors, Japanese tax authorities and accounting standard setters are considering whether or not book-tax conformity is necessary (Suzuki 2013). If the tax system infers firm manager accounting behaviors, firm managers may prioritize tax savings rather than the provision of information to investors, and the purpose of accounting systems will not be achieved. The purpose of this paper is to investigate whether the book-tax conformity (or difference) influences earnings quality.

Dechow and Schrand (2004) defined earnings quality and stated that "a high-quality earnings number is one that accurately reflects the company's current operating performance, is a good indicator of future operating performance, and is a useful summary measure for assessing firm value (Dechow and Schrand 2004, p.5)." Earnings quality has been discussed in various forms. For example, accrual quality, earnings persistence, and the usefulness of forecasting are popular indicators of earnings quality. Dechow and Dichev (2002) defined accrual quality as the magnitude of the estimation error of future cash flow. Lev (1983), Ali and Zarowin (1992), and Francis *et al.* (2004) used a first-order autoregressive model (AR1) to estimate earnings persistence. Dechow *et al.* (1998) developed models of accounting processes and revealed that accruals improve the accuracy of future cash flow forecasting.

The relationship between earnings and stock return (value relevance) is also a popular indicator of earnings quality. This relationship is estimated by the coefficient of earnings in a return-earnings regression model. This coefficient is called the earnings response coefficient (ERC). The value relevance is changed by the information that correlates with economic income. Kothari and Zimmerman (1995) and Kothari (2001) indicated that value relevance decreases when the income includes noise that is uncorrelated with economic income. This study focuses on the value relevance of book income to investigate the relation between BTD and information content of book income.

Many articles that investigate BTD and earnings quality have been published; however, there is no consensus with respect to the effects of BTD on earnings quality. Some studies have argued that book-tax conformity improves earnings quality (Desai 2003, 2005; Hanlon 2005; Mills 1998; Mills and Newberry 2001), whereas other studies have argued that BTD improves earnings quality. Hanlon *et al.* (2008), for example, used a sample of firms that were required for tax purposes to adopt the accrual method in place of the cash method, thereby increasing the degree of conformity between book and taxable income. The authors found that firms employing the accrual method exhibited a greater decrease in the earnings-return relationship compared to the same firms using the cash method. Moreover, Atwood *et al.* (2010) indicated that BTD improves earnings persistence and earnings to future cash flow relations.

Using a sample of Japanese firms, we attempt to study the potential implications of BTD caused by various factors such as earnings management and system change. A major BTD difference between Japan and other countries is that, in Japan, the majority of BTD is composed of accruals. We link the studies on BTD and accruals using Japanese data. Moreover, after 1998, Japanese accounting and tax systems changed, and Japanese firms faced an expansion in BTD. Using Japanese data, we observe the influence of BTD in different environments. Observing the effect of BTD components and the effect of a changing environment is significant because prior studies have revealed that managers select methods of earnings management to achieve financial and tax purposes[1]. Some prior studies have also suggested that the influence of BTD on earnings quality might be changed by the design and the operation of accounting and tax systems (Ali and Hwang 2000, Guenther and Young 2000, Hung 2001). These factors might resolve the conflicting results of previous BTD studies.

Accrual based earnings management research includes studies of earnings management with relatively low book-tax conformity and earnings management with relatively high book-tax conformity. Northcut and Vines (1998) conducted a study of earnings management with relatively low book-tax conformity and found that managers use accruals with relatively low book-tax conformity to minimize political cost. Phillips *et al.* (2003; 2004) indicated that deferred tax expense (one of the components of accruals with relatively low book-tax conformity) can be applied to detect earnings management. Guenther (1994) conducted a relative study of earnings management with relatively high book-tax conformity and found that managers use working capital accrual[2] for tax purposes. Guenther *et al.* (1997) and Yamashita and Otogawa (2008) also indicated that firms use accruals with relatively high book-tax conformity to minimize tax cost. Calegari (2000) investigated discretionary book-tax accruals (DBTA) and discretionary book-only accruals (DBOA). He revealed that managers distinguish between the two types of accrual and use DBTA (DBOA) to minimize tax cost (to accomplish financial reporting objectives).

Some studies concerning BTD have tested the effects of institutional BTD and discretionary BTD on earnings quality (Ayers *et al.* 2009; Blaylock *et al.* 2012; Tang and Firth 2012). These studies indicated that increasing discretionary BTD (BTD caused by earnings management and tax avoidance) reduces earnings persistence and value relevance. Tang and Firth (2012) decomposed Chinese firm BTD to institutional BTD and discretionary BTD. The authors found that increasing institutional and discretionary BTD reduced earnings persistence. Moreover, the authors found that discretionary BTD causes lower earnings persistence than institutional BTD. The authors also found that institutional BTD increases value relevance. These results suggest that the influence of these elements is different.

This study decomposes total book-only accruals to non-discretionary book-only accruals (NBOA) and DBOA. Almost all BTD in Japan occurs from total book-only accruals. Therefore, we can decompose total book-only accruals easily using a Japanese dataset. This decomposition allows us to unite the studies of BTD and accruals. A substantial number of prior studies address accruals. We can discuss BTD using these accrual studies. Moreover, we compare the accruals (NBOA and DBOA) and accruals that do not cause BTD (non-discretionary book-tax accruals: NBTA and DBTA). The accruals relate to future cash flow and the accuracy of forecasting (Dechow and Dichev 2002, Dechow *et al.* 1998). To investigate the specific influence of BTD, we compare the two types of accruals (book-tax accruals and book-only accruals)[3]. This subject is one of our contributions to the existing research.

We focus on the timing of accounting and tax system changes. Hanlon, Maydew, and Shevlin (2008) and Tang and Firth (2012) indicated that BTD (especially institutional BTD) improves earnings quality. Ali and Hwang (2000) and Guenther and Young (2000) also revealed that several country-specific factors, which include the degree of BTD and legal factors, influence earnings quality. However, Hung (2001) used BTD as a control variable to test for value relevance and indicated that BTD did not show significant influence after controlling for other factors. BTD is likely to be dependent on legal systems, and the BTD effect might be altered by the design and the operation of the accounting and tax system. Therefore, BTD (institutional BTD) do not always improve earnings quality. To test this, we focus on the period of the accounting big bang in Japan. During this period, although the degree of BTD increased, accounting standards were unstable.

In addition, the analysis in the current study uses individual Japanese financial statements. Taxable income is calculated from book income of individual financial statements; therefore, tax avoidance through havens does not affect Japanese BTD. Moreover, the Japanese companies also disclosed actual taxable income up to fiscal year 2004.[4] Therefore, it is possible to reduce the estimation error of the taxable income. These points are advantages for our research design and allow us to accurately estimate BTD.

Our results reveal the following: (1) large discretionary book-only accruals (DBOA)[5] reduce the value relevance of earnings, (2) the value relevance of firms with large non-discretionary book-only accruals (NBOA) is greater than the value relevance of other firms; however, this result is not clear from a comparison of the value relevance of firms with large non-discretionary book-tax accruals (NBTA), and (3) the relationship between BTD and value relevance depends on the accounting system and the taxation system. The relationship between BTD and earnings quality is complex. Because large NBOA increases the value relevance, earnings quality is improved when the BTD increases. However, our results suggest that this improvement occurs from accruals and is not BTD-specific. Moreover, large discretionary BTD (DBOA) decreases earnings quality. Therefore, if the accounting system and the tax system are separate, reducing the discretion of financial statements might be effective in improving the quality of earnings. Additionally, the relationship between BTD and earnings quality is affected by both the accounting and tax systems. Therefore, policy makers of accounting systems should consider the accounting and tax systems to improve the quality of book income.

This paper is organized as follows. Section 2 provides an overview of Japanese BTDs. The simple model and hypotheses are presented in Section 3. Section 4 contains the research design. The main results and robustness checks are described in Section 5, and Section 6 presents the conclusions.

BOOK-TAX DIFFERENCE IN JAPAN

Institutional Book-tax Difference

The Japanese corporate tax system is dependent on the accounting system. There is, therefore, a strong relationship between the corporate tax system and the accounting system (Suzuki 2013). In Japan, book income is calculated by individual financial statements first, and taxable income is calculated from book income. Therefore, the accounting policy that is used to calculate book income must also be applied to the calculation of taxable income. Moreover, taxable revenue and taxable expense must be accounted for in book revenue and book expense. These relationships between the accounting system and the corporate tax system are called "kakutei-kessan shugi." Under the Japanese tax system, individual financial statements are not affected by consolidated grouping,[6] and tax avoidance does not cause BTD.

The financial accounting system is based on the accrual method to provide useful information to investors. However, the tax accounting system is based on the vesting principle to ensure fairness and to prevent tax avoidance. Therefore, when depreciation and allowance for doubtful accounts exceed the upper limit as determined by tax law, they are not recognized in taxable income. Bonus allowances can be recognized in book income; however, they cannot be recognized in taxable income. The result is that the majority of BTD is caused by accounting accruals (such as depreciation, amortization, and allowances), and Japanese BTD is mostly negative.

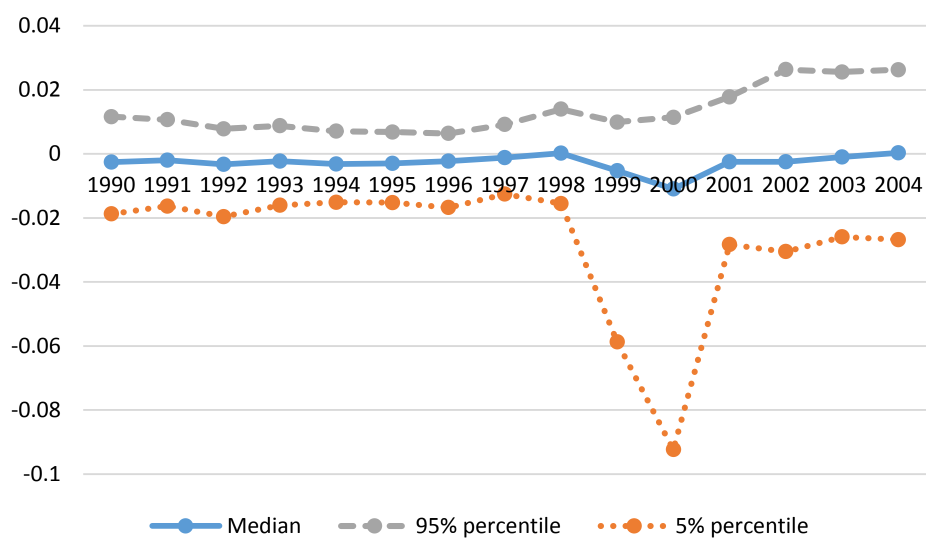
The Tax Reform Act of 1998 and the Accounting Big Bang

From fiscal year 1998 to 2001, significant accounting system and institutional tax system change occurred. These institutional changes had the following effect. Because discretionary taxable income decreased following the Tax Reform Act of 1998, and the accounting system was significantly revised by the Accounting Big Bang, firms were forced to increase BTD.

The corporate tax system no longer accepted certain accounting treatments that were accepted by accounting standards for the securing of financial resources. The Tax Reform Act of 1998 that was implemented included the abolition of installment sales, the abolition or reduction of allowances, and the unification of the straight-line method of depreciation for buildings. As a result of the Tax Reform Act of 1998, the relationship between book income and taxable income was weakened.

From 1998, accounting standards for individuals were progressively established to harmonize with international accounting standards (a phase called the Accounting Big Bang in Japan). The standards included those for tax effect accounting and the standards for retirement benefits, which were established in 1998; the standards for financial instruments, which were established in 1999; and the standards for the impairment of fixed assets, which were established in 2002. As a result of the continuous revisions in accounting standards, companies expanded the degree of BTD because the various accounting treatments of new accounting standards differed from treatments, which the taxation system had defined.

Figure 1
BTD IN JAPAN



Summary of BTD of our sample from Japan. BTD is calculated by net income minus taxable income and is deflated by total assets t - 1.

Figure 1 summarizes the magnitude of the accounting big bang in Japan. Before 1997, the median BTD (deflated by total assets of t - 1) of our sample tends to become negative, and BTD is distributed near zero. Contrastingly, since 1998, the distribution of BTD has expanded. Kometani (2006) investigated the impact of these system changes on BTD. The author indicates that BTD increased after 1998, and the system changes of 1998 affected the characteristics of BTD in Japan.

HYPOTHESIS DEVELOPMENT

Simple model

To provide a structure on which to base the hypotheses, we introduce a simple model based on the research of Hanlon *et al*. (2008) (Kothari and Zimmerman 1995 and Kothari, 2001 also indicate this type of model). We define X as accounting income, x as economic income, u as noise, and f as bias. Hanlon *et al*. (2008) define f as downward bias. However, the bias is not defined as downward bias because doing so would prevent a discussion concerning upward earnings management. Given the limitations of adjusted earnings, the range assumes $-1 < f < 1$.

$$X = (1 + f)\, x + u \tag{1}$$

Assume that stock returns reflect economic earnings, $R = x$. However, the firm's reported earnings are not x but rather, X, and we estimate

$$R = a + bX + e \tag{2}$$

where b is the estimated earnings response coefficient (ERC).

$$b = (1 + f)\, \sigma^2(x) \,/\, \{(1 + f)^2 \sigma^2(x) + \sigma^2 (u)\} \tag{3}$$

The following relationship is derived differentiating each noise ($\sigma^2 (u)$) and bias (f) in equation (3).

$$\partial b \,/\, \partial \sigma^2 (u) < 0 \tag{4}$$
$$\partial b \,/\, \partial f \quad < 0 \qquad \text{if} \quad f > \{\sigma(u)/\sigma(x)\} - 1 \tag{5}$$
$$\partial b \,/\, \partial f \quad > 0 \qquad \text{if} \quad f < \{\sigma(u)/\sigma(x)\} - 1 \tag{6}$$

If accounting income (X) reflects economic income (x) perfectly, $b = 1$. However, equations (4), (5), and (6) show that the ERC (b) is influenced by both noise u and bias f. For instance, if the ratio of noise and economic income is 1:5, ERC becomes negative when bias is greater than -0.8 ($f > -0.8$), and ERC become positive when bias is less than -0.8 ($f < -0.8$). Tax income is linked to book income in Japan; therefore, manager usually does not reduce the tax income extremely. Moreover, the standard deviation of the adjustable portion is usually less than the standard deviation of economic income. Therefore, equation (5) is true in most cases.[7]

Value Relevance and Book-tax Difference in Earnings Management

Mills and Newberry (2001) and Phillips *et al*. (2003, 2004) revealed the existence of earnings management with relatively low book-tax conformity. Mills and Newberry (2001) indicated that earnings management incentives, such as financial distress, influence BTD. Phillips *et al*. (2003, 2004) posited that room for earnings management in taxable income is less than that for book income, and the authors indicate that BTD is useful in the detection of earnings management to avoid loss and decline.

If the management of earnings can be achieved with relatively low book-tax conformity, managers will exhibit greater upward earnings because they are not required to consider tax cost. For instance, Guenther *et al*. (1997) indicated that firms employ upward earnings management in cases of large BTD. Calegari (2000) indicated that managers use DBOA for long-term upward earnings without a corresponding upward taxable income.

These prior studies suggest that DBOA creates noise (u) and an upward bias ($f > 0$) in accounting earnings. Noise and upward bias decrease the earnings response coefficient (equations 4 and 5). However, accounting accruals are useful for forecasting future earnings (Dechow, 1994) and these do not always create noise and bias in book income. Therefore, we focus on firms with substantial DBOA.

H1a *Ceteris paribus, the ERC of firms with a large absolute value of DBOA is low compared to other firms.*

The difference between DBOA and DBTA must be considered. Extreme earnings management creates noise in book income. However, in a book-tax conformity situation, downward earnings management is increased because tax cost is considered. Guenther *et al*. (1997) indicated that managers largely engage in downward earnings management in situations of book-tax conformity. Guenther (1994) and Calegari (2000) suggested that DBTA is used to minimize tax cost. Baez-Diaz and Alam (2013) also indicated that DBTA is lower than DBOA.

Earnings management by DBTA, although it creates noise (u) similar to earnings management by DBOA, also creates downward bias ($f < 0$ or $f = 0$) in book income. Therefore, earnings management by DBOA reduces the earnings response coefficient to a greater extent than earnings management by DBTA (equation 5).

H1b *Ceteris paribus, the ERC of firms with a large absolute value of DBOA is lower than the ERC of firms with large absolute value of DBTA.*

Value Relevance and Institutional Book-tax Difference

Recent studies suggest that increasing institutional BTD can improve earnings quality. Hanlon *et al*. (2008) and Tang and Firth (2012) indicated that earnings quality improves in situations of large BTD because managers can use book income to reflect private information without concern for tax costs. Atwood *et al*. (2010) suggested that earnings persistence and earnings to future cash flow relations are weak in countries that require book-tax conformity. Baez-Diaz and Alam (2013) argued that the market creates mispricing of earnings persistence by the tax system because the tax system is complex and not designed to provide investor information. Previous studies have found that, if the accounting system is disconnected from the tax system, private manager information is reflected in book income, and the ERC increases because noise is reduced (equation 4). We propose the following hypotheses to examine these findings.

H2a *Ceteris paribus, the ERC of firms with a large absolute value of NBOA (non-discretionary accruals that generate institutional BTD) is higher compared to other firms.*

H2b *Ceteris paribus, the ERC of firms with a large absolute value of NBOA is higher than the ERC of firms with large absolute value of NBTA (non-discretionary accruals that do not generate BTD).*

The relationship between the value relevance and elements of BTD depends on the design and operation of the accounting (tax) system. For example, when accounting standards are unstable, or when noise is not included in taxable income, the ERC may not increase with an increase in BTD. In 1998, the tax system was revised to reduce discretionary taxable income, and the relationship between book income and taxable income became weak in Japan. Additionally, the Japanese accounting standards were revised after 1998. Consequently, although BTD increased, the book income of substantial BTD firms began to include some temporary components.

Hanlon *et al*. (2005) compared the information content of taxable income and book income. The authors revealed that taxable income also contains additional information concerning firm performance. Kometani (2005) investigated the value relevance of book and taxable income in Japan. He revealed that the difference between the explanatory power of book income and taxable income on stock returns in Japan is minimal. Additionally, the explanatory power of taxable income is greater than that of book income in several periods of analysis. Onuma, Suzuki, and Yamashita (2009) indicated that the value relevance of book income became lower than the value relevance of taxable income in Japan after 1998. We, therefore, propose the following hypothesis.

H3a *Ceteris paribus, following revisions in the accounting and tax systems (after fiscal year 1998), the ERC of firms with large absolute value of DBOA/NBOA is lower than it had been prior to the accounting and tax system revisions (before fiscal year 1997).*

H3b *Ceteris paribus, the level of reduction in the ERC of firms with large absolute value of DBOA/NBOA, as a result of accounting and tax system revisions, is greater than the level of reduction of the ERC of firms with large absolute value of DBTA/NBTA.*

EMPIRICAL DESIGN

Measuring Accruals

To analyze BTD, we decompose the accruals. The total accruals (TA) are calculated as follows.

$$TA = \Delta(CA - CASH - FINANCIAL\_CA) - \Delta(CL - FINANCIAL\_CL) - \Delta OTHER\_ALLOWANCE + OTHER\_PL\_ACC - DEP \quad (7)$$

In equation 7, Δ represents the difference from year t - 1 to year t, CA represents current assets, CASH represents cash and deposits, CL represents current liabilities, and DEP represents depreciation and amortization. We have calculated other items as follows:

FINANCIAL_CA: Short-term investment securities + short-term loans receivable + treasury stock + money held in trust.

FINANCIAL_CL: Short-term loans payable + commercial papers + current portion of long-term loans payable + current portion of bonds and convertible bonds + notes payable facilities + accounts payable facilities.

OTHER_ALLOWANCE: Δallowance for doubtful accounts (in fixed assets) +Δprovision (in fixed liabilities).

OTHER_PL_ACC: Gain in asset valuation − loss in asset valuation + gain in revaluation of securities (extraordinary item) − loss in revaluation of securities (extraordinary item) − impairment loss.

Total book-only accrual (TBOA) is obtained by calculating BTD. Calegari (2000) and Baez-Diaz and Alam (2013) calculate TBOA and total book-tax accrual (TBTA) by classifying each component of the accrual. However, we cannot classify each component of the accrual under Japanese accounting standards because the items are eliminated from a calculation of taxable income when they exceed the predetermined amount. Northcut and Vines (1998) consider that BTD is TBOA. We assume that BTD is TBOA because the majority of BTD elements are accruals in Japan.

$$TBOA = net\ income\ before\ tax - taxable\ income \qquad (8)$$
$$TBTA = TA - TBOA \qquad (9)$$

To estimate discretionary accruals (DBOA, DBTA), we employ the Jones model (Jones, 1991) and the forward-looking (FL) model by Dechow *et al.* (1995) and Dechow *et al.* (2003). Because Japanese TBOA (BTD) includes items that are affected by forward-looking statements such as allowances, we also employ the FL model. We estimate these models by each industry[8] and each year. Subscripts that represent the industry and the year are omitted.

$$TBTA = a_0 + a_1 \Delta REV + a_2\ GPPE + e_1 \qquad (10)$$
$$TBOA = b_0 + b_1 \Delta REV + b_2\ GPPE + e_2 \qquad (11)$$

$$TBTA = c_0 + c_1\ ((1+k)\Delta REV - \Delta AR) + c_2\ GPPE + c_3\ LAG\_TBTA + c_4\ GR\_REV + e_3 \qquad (12)$$
$$TBOA = d_0 + d_1\ ((1 + k)\Delta REV - \Delta AR) + d_2\ GPPE + d_3\ LAG\_TBOA + d_4\ GR\_REV\ e_4 \qquad (13)$$

REV represents revenue, AR represents accounts receivable, GPPE represents gross property, plant, and equipment and these variables are deflated by total assets for the year t - 1. LAG_TBTA (LAG_TBOA) represents the lagged variable of TBTA (TBOA). GR_REV represents the growth rate of revenue.[9] The value of k is the regression coefficient of ΔREV for ΔAR.[10] NBTA is estimated by equation 10 and equation 12, and these residuals are DBTA. NBOA is estimated by equation 11 and equation 13, and these residuals are DBOA.

The Empirical Model

This paper investigates the relationship between BTD components and value relevance by comparing firms with large DBOA (NBOA) and firms with large DBTA (NBTA). Consistent with Kothari and Zimmerman (1995), Francis and Schipper (1999), and Hanlon *et al*. (2008), we use the following regression model.[11] This model supposes that the market return provides richer information than accounting earnings; therefore, these models do not require that financial statements be the earliest source of information.

$$
\begin{aligned}
RET = {} & \alpha_0 + \alpha_1\, QDBTA + \alpha_2\, QDBOA + \alpha_3\, QNBTA + \alpha_4\, QNBOA \\
& + \alpha_5\, X + \alpha_6\, X{*}QDBTA + \alpha_7\, X{*}QDBOA + \alpha_8\, X{*}QNBTA + \alpha_9\, X{*}QNBOA \\
& + \alpha_{10}\, Change + \alpha_{11}\, Change * QDBTA + \alpha_{12}\, Change * QDBOA \\
& + \alpha_{13}\, Change{*}QNBTA + \alpha_{14}\, Change * QNBOA \\
& + \alpha_{15}\, Change{*}X + \alpha_{16}\, Change * X * QDBTA + \alpha_{17}\, Change * X * QDBOA \\
& + \alpha_{18}\, Change * X * QNBTA + \alpha_{19}\, Change * X * QNBOA \\
& + \alpha YEAR + \alpha IND + \varepsilon_1
\end{aligned} \tag{14}
$$

$$
\begin{aligned}
RET = {} & \beta_0 + \beta_1\, QDBTA + \beta_2\, QDBOA + \beta_3\, QNBTA + \beta_4\, QNBOA \\
& + \beta_5\, BV + \beta_6\, BV * QDBTA + \beta_7\, BV * QDBOA \\
& + \beta_8\, BV * QNBTA + \beta_9\, BV * QNBOA \\
& + \beta_{10}\, X + \beta_{11}\, X * QDBTA + \beta_{12}\, X * QDBOA \\
& + \beta_{13}\, X * QNBTA + \beta_{14}\, X * QNBOA \\
& + \beta_{15}\, Change + \beta_{16}\, Change * QDBTA + \beta_{17}\, Change * QDBOA \\
& + \beta_{18}\, Change * QNBTA + \beta_{19}\, Change * QNBOA \\
& + \beta_{20}\, Change * BV + \beta_{21}\, Change * BV * QDBTA + \beta_{22}\, Change * BV * QDBOA \\
& + \beta_{23}\, Change * BV * QNBTA + \beta_{24}\, Change * BV * QNBOA \\
& + \beta_{25}\, Change * X + \beta_{26}\, Change * X * QDBTA + \beta_{27}\, Change * X * QDBOA \\
& + \beta_{28}\, Change * X * QNBTA + \beta_{29}\, Change * X * QNBOA \\
& + \beta\, YEAR + \beta IND + \varepsilon_2
\end{aligned} \tag{15}
$$

RET: Market value of equity at the fiscal year end of t. It is scaled by the market value of equity at the fiscal year end of t - 1.
X: Net income before tax. It is scaled by the market value of equity at t - 1.
BV: Book value of net assets. It is scaled by the market value of equity at t - 1.
QDBOA: QDBOA is a dummy variable. If the absolute value of DBOA is 25% of the highest ranking of each year, it is 1 and 0 otherwise.
QDBTA: QDBTA is a dummy variable. If the absolute value of DBTA is 25% of the highest ranking of each year, it is 1 and 0 otherwise.
QNBOA: QNBOA is a dummy variable. If the absolute value of NBOA is 25% of the highest ranking of each year, it is 1 and 0 otherwise.
QNBTQ: QNBTA is a dummy variable. If the absolute value of NBTA is 25% of the highest ranking of each year, it is 1 and 0 otherwise.
Change: Change is a dummy variable. It is set equal to 1 if the observation is after the fiscal year 1998 (1998 to 2004) and equal to 0 if the observation is prior to fiscal year 1998 (1990 to 1997).
YEAR: YEAR is a vector of the year dummy variables.
IND: IND is a vector of the industry dummy variables.

α7 (β12) is the coefficient of the interaction term QDBOA and X. It represents the difference between the ERC of firms with a large DBOA and the ERC of other firms. Hypothesis 1a predicts α7 (β12) < 0, if DBOA creates noise and bias in book income. The effect of QDBOA becomes apparent by a comparison with the coefficient of the interaction term QDBTA and X, α6 (β11). We predict that α7 (β12) is smaller than α6 (β11), according to Hypothesis 1b.

Hypothesis 2a is tested using the coefficient of the interaction term QNBOA and X, $\alpha9$ ($\beta14$). We predict $\alpha9$ ($\beta14$) > 0 and $\alpha9$ ($\beta14$) will be greater than the coefficients of the interaction term QNBTA and X ($\alpha8$, $\beta13$), according to Hypothesis 2b.

$\alpha17$ ($\beta27$) is the coefficient of the interaction term QDBOA and X and Change. $\alpha19$ ($\beta29$) is the coefficient of the interaction term QNBOA and X and Change. These are indicators of a change in the ERC of firms with large BTD. We predict these coefficient signs will become negative, according to Hypothesis 3a. We also predict that $\alpha17$ ($\beta27$) and $\alpha19$ ($\beta29$) will be smaller than $\alpha16$ ($\beta26$) and $\alpha18$ ($\beta28$), according to Hypothesis 1b. $\alpha16$ ($\beta26$) and $\alpha18$ ($\beta28$) are an indicator of the firms with large DBTA and large NBTA.

Sample Selection

We select a sample of observations from the Nikkei NEEDs database and the Kabuka CD-ROM database from fiscal year 1990 to 2004[12] that meet the following criteria:

1. The firm is listed in Section 1 of the Tokyo Stock Exchange.
2. The taxable income has exceeded 40 million yen for the last two years.
3. The observations for estimating discretionary accruals are available.
4. The firms are listed throughout the analysis period, and the firms have not changed the accounting period.
5. The observations are available to estimate the empirical model.

We estimate discretionary accruals using the sample, according to the third criterion. To mitigate the effects of mergers and acquisitions or new listings, we established the fourth criterion. We process 0.1% of both ends of the distribution of each variable as outliers. Consequently, the final sample is composed of 11,987 firm-year observations.

Table 2 contains the descriptive statistics for the sample. The data exhibit higher performance than usual as a result of the second criterion. The average of X (net income before tax / market value of equity) is approximately 5%.

Table 3 summarizes the characteristics of the descriptive statistics of firms with large accruals. The firms with large DBOA are summarized on Panel A (Panel E) of Table 3. This indicates that the mean of X for these firms is smaller than other firms. There is a possibility that the estimation of DBOA is affected by corporate performance.

Table 1
SAMPLE SELECTION

Panel A: Pooled sample

		Firm-year
[1]	The firm is listed in Section 1 of the Tokyo Stock Exchange.	22,081
[2]	The taxable income has exceeded 40 million yen for the last two years.	15,905
[3]	The observations for estimating discretionary accruals are available.	15,364
[4]	The firms are listed throughout the analysis period and the firms have not changed the accounting period.	12,861
[5]	The observations are available to estimate the empirical model.	12,055
	Elimination of outliers	68
	Final sample	11,987

Panel B: Sample by year

	Year	Firm-year
[1]	1990	811
[2]	1991	902
[3]	1992	891
[4]	1993	837
[5]	1994	840
[6]	1995	880
[7]	1996	923
[8]	1997	887
[9]	1998	785
[10]	1999	773
[11]	2000	811
[12]	2001	727
[13]	2002	647
[14]	2003	662
[15]	2004	611
	Total	11,987

Panel C: Sample by industry classification

		Total	Top 25% absolute value firms			
			DBOA	DBTA	NBOA	NBTA
[1]	Foods	710	201	159	42	246
[2]	Textiles & Apparel	294	100	57	64	95
[3]	Pulp & Paper	90	4	12	32	51
[4]	Chemicals/Pharmaceuticals	1,409	468	265	533	219
[5]	Petroleum/Rubber	217	74	28	85	84
[6]	Glass & Ceramics	212	56	39	61	68
[7]	Steel/Nonferrous Metals	724	197	189	101	177
[8]	Machinery	930	242	263	185	70
[9]	Electric Machinery	1,150	321	294	366	194
[10]	Shipbuilding/Automobiles & Auto parts/ Transportation Equipment	564	208	141	217	383
[11]	Precision Instruments	267	89	73	112	22
[12]	Other Manufacturing	398	83	74	121	37
[13]	Fishery/Mining	69	11	8	13	8
[14]	Construction	960	205	304	520	46
[15]	Trading Companies	1,137	184	367	111	100
[16]	Retail	672	122	173	49	183
[17]	Other Financial Services	224	8	94	38	137
[18]	Real Estate	173	23	59	5	58
[19]	Railway & Bus/Land Transport/Marine Transport/ Air Transport/Warehousing	657	115	96	95	269
[20]	Communications	63	20	13	37	43
[21]	Electric Power/Gas	224	9	2	63	223
[22]	Services	843	257	287	147	284
	Total	11,987	2,997	2,997	2,997	2,997

DBOA = Discretionary book only accruals, DBTA = Discretionary book-tax accruals, NBOA = Non-discretionary book only accruals, and NBTA = Non-discretionary book-tax accruals.

Table 2
SUMMARY STATISTICS

Panel A: Descriptive statistics (N = 11,987)

	Mean	Median	5%	95%	Std. Dev.
RET	1.015	0.952	0.583	1.658	0.375
X	0.059	0.051	0.008	0.155	0.060
BV	0.755	0.615	0.222	1.786	0.507

Panel B: Pearson correlation matrix (N = 11,987)

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
[1]	RET	1.000	0.337	0.272	0.025	0.022	0.024	0.019	0.010	0.024	0.049	0.044
[2]	X		1.000	0.307	0.024	0.024	-0.096	-0.093	0.002	0.035	0.009	0.002
[3]	BV			1.000	-0.012	-0.007	-0.057	-0.055	-0.064	-0.049	-0.016	-0.030
[4]	QDBTA(Jones)				1.000	0.745	0.054	0.048	-0.004	0.024	0.015	0.025
[5]	QDBTA(FL)					1.000	0.049	0.046	-0.004	0.023	0.007	0.020
[6]	QDBOA(Jones)						1.000	0.754	-0.023	-0.016	0.117	0.130
[7]	QDBOA(FL)							1.000	-0.028	-0.022	0.104	0.154
[8]	QNBTA(Jones)								1.000	0.680	-0.010	-0.010
[9]	QNBTA(FL)									1.000	0.008	0.015
[10]	QNBOA(Jones)										1.000	0.573
[11]	QNBOA(FL)											1.000

RET = Market value of equity at the fiscal year end of t, X = Net income before tax, and BV = Book value of net assets. These are scaled by the market value of equity at the fiscal year end of t - 1. QDBTA (QDBOA) is a dummy variable. If the absolute value of DBTA (DBOA) is 25% of the highest ranking of each year, it is 1 and 0 otherwise. QNBTA (QNBOA) is a dummy variable. If the absolute value of NBTA (NBOA) is 25% of the highest ranking of each year, it is 1 and 0 otherwise. The estimation model is shown in parentheses. Jones = Jones Model and FL = Forward-looking Model.

Table 3
SUMMARY OF EACH GROUP

Estimated by Jones Model						Estimated by Forward-looking Model					
	Mean	Median	5%	95%	Std. Dev.		Mean	Median	5%	95%	Std. Dev.
Panel A:						Panel E:					
Top 25% of the absolute value of DBOA (N = 2,997)						Top 25% of the absolute value of DBOA (N = 2,997)					
RET	1.030	0.953	0.582	1.728	0.419	RET	1.027	0.948	0.572	1.727	0.410
X	0.049	0.050	-0.068	0.156	0.085	X	0.049	0.050	-0.061	0.155	0.084
BV	0.705	0.589	0.208	1.643	0.468	BV	0.707	0.592	0.209	1.659	0.467
Panel B:						Panel F:					
Top 25% of the absolute value of DBTA (N = 2,997)						Top 25% of the absolute value of DBTA (N = 2,997)					
RET	1.031	0.953	0.564	1.765	0.430	RET	1.029	0.953	0.567	1.743	0.424
X	0.061	0.053	0.006	0.170	0.067	X	0.061	0.052	0.007	0.170	0.065
BV	0.745	0.598	0.201	1.837	0.521	BV	0.749	0.598	0.202	1.843	0.524
Panel C:						Panel G:					
Top 25% of the absolute value of NBOA (N = 2,997)						Top 25% of the absolute value of NBOA (N = 2,997)					
RET	1.047	0.980	0.597	1.730	0.401	RET	1.043	0.967	0.594	1.730	0.399
X	0.060	0.057	0.003	0.152	0.067	X	0.059	0.057	0.001	0.151	0.069
BV	0.741	0.590	0.206	1.782	0.520	BV	0.729	0.586	0.209	1.764	0.503
Panel D:						Panel H:					
Top 25% of the absolute value of NBTA (N = 2,997)						Top 25% of the absolute value of NBTA (N = 2,997)					
RET	1.021	0.968	0.598	1.652	0.357	RET	1.030	0.974	0.599	1.666	0.372
X	0.059	0.049	0.008	0.156	0.056	X	0.063	0.051	0.009	0.165	0.055
BV	0.699	0.595	0.214	1.556	0.440	BV	0.712	0.595	0.212	1.598	0.458

RET = Market value of equity at the fiscal year end of t, X = Net income before tax, and BV = Book value of net assets. These are scaled by the market value of equity at the fiscal year end of t - 1.

THE RESULTS

The Main Results

Table 4 presents the results of equations 14 and 15. The coefficient [13] of the interaction term QDBOA and X has a negative sign, and is statistically significant in all of the models in Table 4. This result suggests that the ERC of the firms with large DBOA is less than the ERC of other firms, which is consistent with Hypothesis 1a. The impact of earnings management in firms with large DBOA is clear in a comparison of the ERC of firms with high DBTA. The difference between the coefficient [13] and coefficient [12] is a negative sign in all of the models in Table 4, which is consistent with Hypothesis 1b. These results suggest that earnings management with relatively low book-tax conformity reveals unique information and causes a lower ERC than earnings management with relatively high book-tax conformity.

The coefficient [15] of the interaction term QNBOA and X has a positive sign, and is statistically significant in Models 1, 2, and 4. This result suggests that the ERC of firms with high institutional BTD is greater than other firms, which is consistent with Hypothesis 2a and prior studies. However, the difference between coefficient [15] and coefficient [14] is not statistically significant in all of the models in Table 4. The impact of institutional BTD (NBOA) is not clear in a comparison of the ERC of firms with large NBTA. This is not consistent with Hypothesis 2b. These results suggest that the non-discretionary accruals that cause institutional BTD to improve the earnings do not have a unique effect because the impact cannot be distinguished from the non-discretionary accruals that do not cause institutional BTD.

The coefficients [28] and [30] indicate the impact of the change in DBOA and NBOA after 1998. These coefficients exhibit a negative sign and the coefficient [30] is particularly statistically significant. Moreover, the null hypothesis that the coefficients [28] and [30] are zero is rejected in all of the models in Table 4. This is consistent with Hypothesis 3a and suggests that the institutional changes after 1998 caused lower ERCs in the firms with large BTD after 1998.

To compare the impact of the change in DBOA (NBOA) and DBTA (NBTA), we established a null hypothesis that [28] - [27] = 0 and [30] - [29] = 0. The result of this restricting test is that this null hypothesis is rejected in Models 3 and 4. However, the null hypothesis is not rejected in Models 1 and 2. This will be verified in a robustness test.

Table 4
MAIN RESULT

Panel A: Jones Model (N = 11,987)

			Model 1		Model 2	
			coeff	*t*-statistic	coeff	*t*-statistic
[1]	const		0.824	24.07 ***	0.811	42.97 ***
[2]	QDBTA		-0.033	-1.79 *	-0.034	-1.55
[3]	QDBOA		0.034	3.01 ***	0.000	0.02
[4]	QNBTA		0.017	1.42	0.040	1.73 *
[5]	QNBOA		0.009	0.49	0.016	0.67
[6]	BV				0.112	5.10 ***
[7]	BV*QDBTA				0.012	0.33
[8]	BV*QDBOA				0.074	1.92 *
[9]	BV*QNBTA				-0.045	-1.12
[10]	BV*QNBOA				-0.015	-0.38
[11]	X		2.479	7.80 ***	2.268	11.80 ***
[12]	X*QDBTA		0.814	2.19 **	0.794	2.74 ***
[13]	X*QDBOA	H1a:(-)	-0.734	-2.37 **	-0.818	-2.96 ***
[14]	X*QNBTA		0.238	0.83	0.272	0.89
[15]	X*QNBOA	H2a:(+)	0.821	1.90 *	0.985	3.30 ***
[16]	Change		0.108	3.31 ***	0.094	4.20 ***
[17]	Change*QDBTA		0.011	0.40	-0.030	-0.96
[18]	Change*QDBOA		0.137	4.41 ***	0.089	2.75 ***
[19]	Change*QNBTA		-0.038	-1.27	-0.046	-1.39
[20]	Change*QNBOA		0.030	0.93	0.018	0.54
[21]	Change*BV				-0.049	-2.00 **
[22]	Change*BV*QDBTA				0.032	0.80
[23]	Change*BV*QDBOA				0.002	0.06
[24]	Change*BV*QNBTA				0.040	0.89
[25]	Change*BV*QNBOA				0.011	0.26
[26]	Change*X		-0.108	-0.23	-0.150	-0.70
[27]	Change*X*QDBTA		-0.402	-0.91	-0.402	-1.28
[28]	Change*X*QDBOA		-0.771	-2.01 **	-0.418	-1.40
[29]	Change*X*QNBTA		-0.101	-0.28	-0.149	-0.44
[30]	Change*X*QNBOA		-1.197	-2.25 **	-1.300	-4.05 ***
	YEAR_DUM		YES		YES	
	IND_DUM		YES		YES	
	Adj. R2		0.323		0.335	

Null hypothesis					
		difference	*F*-statistic	difference	*F*-statistic
[13]-[12] = 0	H1b:(-)	-1.548	13.061 ***	-1.612	12.498 ***
[15]-[14] = 0	H2b:(+)	0.583	0.750	0.713	1.004
[28]-[27] = 0		-0.369	0.152	-0.015	0.041
[30]-[29] = 0		-1.095	2.633	-1.151	2.592
		mean	*F*-statistic	mean	*F*-statistic
[27] = 0 and [29] = 0		-0.252	1.172	-0.276	1.188
[28] = 0 and [30] = 0	H3a:(-)	-0.984	9.262 ***	-0.859	6.993 ***
[28]-[27] = 0 and [30]-[29] = 0	H3b:(-)	-0.732	1.473	-0.583	1.309

Panel B: Forward-looking Model (N = 11,987)

			Model 3		Model 4	
			coeff	*t*-statistic	coeff	*t*-statistic
[1]	const		0.825	23.90 ***	0.816	19.92 ***
[2]	QDBTA		-0.019	-1.03	-0.030	-1.32
[3]	QDBOA		0.032	2.37 **	0.007	0.48
[4]	QNBTA		0.002	0.23	0.028	1.99 **
[5]	QNBOA		0.007	0.43	0.004	0.15
[6]	BV				0.104	1.54
[7]	BV*QDBTA				0.035	1.92 *
[8]	BV*QDBOA				0.051	1.48
[9]	BV*QNBTA				-0.056	-1.77 *
[10]	BV*QNBOA				0.012	0.41
[11]	X		2.568	7.27 ***	2.379	7.68 ***
[12]	X*QDBTA		0.423	1.19	0.304	0.98
[13]	X*QDBOA	H1a:(-)	-0.800	-2.31 **	-0.839	-2.06 **
[14]	X*QNBTA		0.412	1.74 *	0.476	1.62
[15]	X*QNBOA	H2a:(+)	0.671	1.63	0.781	2.31 **
[16]	Change		0.111	2.99 ***	0.101	2.14 **
[17]	Change*QDBTA		0.035	0.80	0.006	0.13
[18]	Change*QDBOA		0.118	2.91 ***	0.040	1.33
[19]	Change*QNBTA		-0.040	-1.18	-0.089	-1.82 *
[20]	Change*QNBOA		0.031	1.34	0.035	0.79
[21]	Change*BV				-0.050	-0.63
[22]	Change*BV*QDBTA				0.002	0.10
[23]	Change*BV*QDBOA				0.048	1.22
[24]	Change*BV*QNBTA				0.099	3.00 ***
[25]	Change*BV*QNBOA				-0.017	-0.40
[26]	Change*X		-0.282	-0.55	-0.308	-0.58
[27]	Change*X*QDBTA		-0.225	-0.50	-0.086	-0.21
[28]	Change*X*QDBOA		-0.559	-1.42	-0.301	-0.68
[29]	Change*X*QNBTA		0.013	0.04	-0.193	-0.56
[30]	Change*X*QNBOA		-1.022	-2.22 **	-1.097	-2.81 ***
	YEAR_DUM		YES		YES	
	IND_DUM		YES		YES	
	Adj. R2		0.322		0.333	
Null hypothesis						
			difference	*F*-statistic	difference	*F*-statistic
[13]-[12] = 0		H1b:(-)	-1.223	5.420 **	-1.142	4.286 **
[15]-[14] = 0		H2b:(+)	0.259	2.084	0.305	1.589
[28]-[27] = 0			-0.334	0.653	-0.215	0.322
[30]-[29] = 0			-1.035	6.510 **	-0.904	4.838 **
			mean	*F*-statistic	mean	*F*-statistic
[27] = 0 and [29] = 0			-0.106	0.115	-0.140	0.050
[28] = 0 and [30] = 0		H3a:(-)	-0.790	9.163 ***	-0.699	7.835 ***
[28]-[27] = 0 and [30]-[29] = 0		H3b:(-)	-0.684	4.569 **	-0.559	3.071 **

Table 4 reports the summary of the main results. The asterisks indicate statistical significance at the 10% (*), 5% (**), and 1% (***) levels. Standard errors are computed after clustering observations by year to mitigate the effects of cross-sectional correlation.

ROBUSTNESS TESTS

Earnings Persistence

To verify robustness, we test the earnings persistence of firms with each accrual. Kothari (2001) proposed one of the original models of Hanlon *et al*. (2008), and Kothari (2001) linked ERC to earnings persistence. We use 12-month stock returns for the dependent variable in equation 14 and 15 because we assume that stock return contains richer information than accounting earnings. However, the stock market does not evaluate the firm value correctly at all times. The stock return is also related to other factors, such as systematic risk. Therefore, we test the robustness of the dependent variable by verifying earnings persistence (Table 5).

The results of this test support Hypotheses 1a, 1b, and 3a. This test also supports Hypothesis 3b. However, this test does not support Hypotheses 2a and 2b. These results suggest that the ERC of firms with large DBOA is less than the ERC of other firms, and the ERC of firms with large BTD was affected by the institutional changes after 1998. However, in this case, earnings persistence cannot explain the increase in the ERC of firms with large NBOA.

Mitigation of Multicollinearity

Our regression models (equations 14 and 15) may have a problem of multicollinearity. To mitigate this problem, we re-tested using X and BV, which were centered (Aiken and West, 1991). The results of these tests were similar to the main results. Therefore, multicollinearity does not have a significant impact on the main results.

Performance-Adjusted Jones-type Models

The summary of the sample indicates that the performance of the firms with large DBOA is inferior to other firms (Table 3). Prior studies suggest that the estimation error of discretionary accruals is related to firm performance (Dechow *et al*. 1995; Kothari, Leone, and Wasley, 2005). Hayn (1995) noted that ERC varied according to firm performance.[13] Therefore, the estimation model of discretionary accruals may influence ERC. We use a performance-adjusted Jones-type model (an ROA-modified Jones model (Kothari *et al*. 2005)) that is controlled by $ROA_{t-1;}$ a CFO-modified Jones model (Subramanyam, 1996) that is controlled by $CFO_{t;}$ and a ⊿CFO-modified Jones model (Kasznik 1999) that is controlled by⊿CFO_t) to verify robustness.

The results of this test show that Hypotheses 1a, 1b, and 3a are supported. These results show that the sign of the coefficient is consistent with Hypothesis 2a, and these are almost statistically significant. Hypotheses 2a and 3b are not supported by this test.

The Selection of Firms with Substantial Accruals

This paper focuses on firms with substantial accruals, and we define these firms as the top 25% of firms with the largest accruals for each year. However, the grouping of these firms depends on the subjectivity of the author. To verify the robustness of this point, we test using indicator variables of the top 20% of firms with the largest accruals or the top 30% of firms with the largest accruals. These results were similar to the results presented in Table 4.

Mitigation of the Sample Selection Bias

The sample firms included in this paper are limited to the firms with 40 million yen or more of annual taxable income. To mitigate problems in the sample selection, we use the sample selection model of Heckman's (1976; 1979) two-step approach.

We establish a selection equation for the accounting for taxation from prior Japanese studies such as Yamashita and Okuda (2006). Japanese taxable income is calculated from book income. However, if the firm carries forward a tax loss, the firm's taxable income is calculated separately from current book income. We consider that taxable income is a function of current book income and book income of a single prior year. The selection equation can be expressed as follows:

$$TAX = \gamma_1 + \gamma_2 \, NIBT + \gamma_3 \, LAG\_NIBT + \varepsilon_3 \tag{16}$$

TAX: This represents the dummy variable. If the firm's taxable income is larger than 40 million yen, it is 1 and 0 otherwise.

NIBT: This represents net income before tax of year t, defeated by total assets at the end of year t - 1.

LAG_NIBT: This represents the NIBT of year t - 1.

We estimate equations 14 and 15, which includes the inverse Mills ratio.

The result of this test, the sign of the coefficient on the inverse Mills ratio is positive and statistically significant. Given these selection biases, Hypotheses 1a, 1b, 2a, 3a, and 3b are supported. We do not observe significant results concerning Hypothesis 2b.

The results of these multiple robustness checks indicate that Hypotheses 1a, 1b, 2a, 3a, and 3b are almost supported. However, Hypothesis 2b is not supported. Earnings management that increases BTD reduces ERC to a greater extent than earnings management that has no relation to BTD. However, the accruals related to institutional BTD increase ERC and the effect cannot be distinguished from accruals not related to institutional BTD. Additionally, the impact of accruals related to BTD on ERC is dependent on the accounting and tax system.

Table 5
TEST OF EARNINGS PERSISTENCE

Panel A: Jones Model (N = 11,987)

			Model 5		Model 6	
			coeff	*t*-statistic	coeff	*t*-statistic
[1]	const		0.006	2.31 **	0.006	1.48
[2]	QDBTA		0.006	2.57 **	0.002	1.00
[3]	QDBOA		0.010	3.28 ***	0.009	2.17 **
[4]	QNBTA		-0.001	-0.74	-0.003	-1.08
[5]	QNBOA		0.006	3.54 ***	0.015	5.41 ***
[6]	BV				0.003	0.33
[7]	BV*QDBTA				0.011	3.15 ***
[8]	BV*QDBOA				0.004	1.08
[9]	BV*QNBTA				0.004	0.62
[10]	BV*QNBOA				-0.022	-4.81 ***
[11]	X		0.850	15.45 ***	0.849	21.29 ***
[12]	X*QDBTA		-0.107	-3.34 ***	-0.139	-3.74 ***
[13]	X*QDBOA	H1a:(-)	-0.191	-3.85 ***	-0.206	-4.41 ***
[14]	X*QNBTA		0.003	0.06	-0.012	-0.22
[15]	X*QNBOA	H2a:(+)	-0.069	-1.32	-0.007	-0.15
[16]	Change		-0.002	-0.47	0.006	0.56
[17]	Change*QDBTA		0.004	1.01	-0.005	-0.88
[18]	Change*QDBOA		0.032	4.97 ***	0.015	2.35 **
[19]	Change*QNBTA		0.006	0.88	0.005	1.03
[20]	Change*QNBOA		0.006	1.75 *	-0.015	-1.74 *
[21]	Change*BV				-0.010	-0.67
[22]	Change*BV*QDBTA				0.003	0.36
[23]	Change*BV*QDBOA				0.016	2.25 **
[24]	Change*BV*QNBTA				-0.001	-0.09
[25]	Change*BV*QNBOA				0.034	3.83 ***
[26]	Change*X		-0.205	-2.60 ***	-0.187	-2.71 ***
[27]	Change*X*QDBTA		0.033	0.71	0.041	0.73
[28]	Change*X*QDBOA		-0.255	-3.05 ***	-0.246	-3.50 ***
[29]	Change*X*QNBTA		0.015	0.23	0.017	0.20
[30]	Change*X*QNBOA		-0.025	-0.37	-0.093	-1.53
	YEAR_DUM		YES		YES	
	IND_DUM		YES		YES	
	Adj. R2		0.305		0.312	
Null hypothesis						
			difference	*F*-statistic	difference	*F*-statistic
[13]-[12] = 0		H1b:(-)	-0.084	4.380 **	-0.067	7.583 ***
[15]-[14] = 0		H2b:(+)	-0.072	0.639	0.005	1.232
[28]-[27] = 0			-0.288	8.375 ***	-0.287	15.645 ***
[30]-[29] = 0			-0.040	0.115	-0.110	0.395
			mean	*F*-statistic	mean	*F*-statistic
[27] = 0 and [29] = 0			0.024	0.260	0.029	3.110 **
[28] = 0 and [30] = 0		H3a:(-)	-0.140	4.783 ***	-0.170	16.138 ***
[28]-[27] = 0 and [30]-[29] = 0		H3b:(-)	-0.164	4.630 ***	-0.199	8.175 ***

Panel B: Forward-looking Model (N = 11,987)

			Model 7		Model 8	
			coeff	t-statistic	coeff	t-statistic
[1]	const		0.004	1.31	0.005	1.23
[2]	QDBTA		0.005	2.23 **	0.003	2.02 **
[3]	QDBOA		0.008	4.57 ***	0.005	1.88 *
[4]	QNBTA		0.000	0.27	-0.001	-0.52
[5]	QNBOA		0.012	2.67 ***	0.017	3.43 ***
[6]	BV				0.001	0.09
[7]	BV*QDBTA				0.006	1.55
[8]	BV*QDBOA				0.009	2.72 ***
[9]	BV*QNBTA				0.005	0.80
[10]	BV*QNBOA				-0.012	-3.52 ***
[11]	X		0.876	12.77 ***	0.881	17.22 ***
[12]	X*QDBTA		-0.091	-2.79 ***	-0.104	-2.64 ***
[13]	X*QDBOA	H1a:(-)	-0.161	-5.44 ***	-0.186	-6.88 ***
[14]	X*QNBTA		-0.042	-1.22	-0.060	-1.90 *
[15]	X*QNBOA	H2a:(+)	-0.150	-1.76 *	-0.115	-1.44
[16]	Change		0.004	0.71	0.006	0.56
[17]	Change*QDBTA		-0.002	-0.25	-0.009	-1.24
[18]	Change*QDBOA		0.033	9.62 ***	0.017	2.62 ***
[19]	Change*QNBTA		0.000	-0.06	0.006	0.93
[20]	Change*QNBOA		-0.002	-0.32	-0.012	-1.73 *
[21]	Change*BV				-0.002	-0.13
[22]	Change*BV*QDBTA				0.004	0.33
[23]	Change*BV*QDBOA				0.010	1.07
[24]	Change*BV*QNBTA				-0.010	-0.77
[25]	Change*BV*QNBOA				0.017	2.89 ***
[26]	Change*X		-0.291	-2.90 ***	-0.295	-3.41 ***
[27]	Change*X*QDBTA		0.114	1.89 *	0.108	1.45
[28]	Change*X*QDBOA		-0.239	-4.38 ***	-0.216	-5.47 ***
[29]	Change*X*QNBTA		0.115	2.21 **	0.140	2.15 **
[30]	Change*X*QNBOA		0.036	0.33	0.005	0.05
	YEAR_DUM		YES		YES	
	IND_DUM		YES		YES	
	Adj. R2		0.301		0.306	
Null hypothesis						
			difference	F-statistic	difference	F-statistic
[13]-[12] = 0		H1b:(-)	-0.070	4.214 **	-0.082	9.857 ***
[15]-[14] = 0		H2b:(+)	-0.109	0.003	-0.055	0.299
[28]-[27] = 0			-0.353	9.206 ***	-0.324	16.548 ***
[30]-[29] = 0			-0.080	0.717	-0.135	0.885
			mean	F-statistic	mean	F-statistic
[27] = 0 and [29] = 0			0.114	0.271	0.124	2.315 *
[28] = 0 and [30] = 0		H3a:(-)	-0.102	7.530 ***	-0.106	16.803 ***
[28]-[27] = 0 and [30]-[29] = 0		H3b:(-)	-0.216	4.613 ***	-0.229	8.478 ***

Table 5 reports the summary of the test of earnings persistence. The asterisks indicate statistical significance at the 10% (*), 5% (**), and 1% (***) levels. Standard errors are computed after clustering observations by year, to mitigate the effects of cross-sectional correlation.

CONCLUSION

This study examined the relationship between the earnings response coefficient (ERC) and accounting accruals (DBOA, DBTA, NBOA, and NBTA) to determine the BTD-specific influence on book income. Recent studies that discuss the difference between book income and taxable income argued that high book-tax conformity increases earnings quality. However, other previous studies argued that high book-tax conformity decreases earnings quality. These conflicting opinions exist because these studies did not decompose BTD into elements or compare the elements and similar items. Additionally, they did not consider the design and the operation of accounting and tax systems. This paper presents the distinguishing BTD factors, compares these components, and focuses on the timing of changes in the accounting and tax systems.

We found that the ERC of firms with large DBOA is lower than that of other firms. This is clear from a comparison of the ERC of firms with large DBTA. These results suggest that the value relevance of accounting earnings is reduced by extreme earnings management with relatively low book-tax conformity. This is consistent with Desai (2005); book-tax conformity prevents a decrease in ERC caused by earnings management.

The ERC of firms with large NBOA is higher than that of other firms. This is consistent with Hanlon *et al*. (2008). BTD improves earnings quality; however, this is not clear from a comparison with the ERC of firms with substantial NBTA. These results suggest that accruals cause an improvement in earnings quality, although this influence is not BTD-specific. Moreover, the improvement in the ERC by NBOA or by large BTD is not always observed. The empirical results indicate that a deterioration in the ERC of firms with large BTD (especially the ERC of firms with large NBOA) is more evident after 1998. The relationship between BTD and value relevance depends on the accounting system and the taxation system. Therefore, BTD might decrease value relevance of book income in an unstable accounting system environment, such as the period of transition to International Financial Reporting Standards.

Our research contributes to policy making with respect to accounting systems. Earnings quality of book income is affected by the tax system. Accounting system policy should consider the tax system, not just the accounting system. If the accounting system and the tax system are separate, reducing the discretion of financial statements might be effective in improving the quality of earnings.

There are still some concerns. First, the method of decomposition of accruals requires further study. We used BTD and Jones-type models to estimate DBOA, NBOA, DBTA, and NBTA. However, these methods are not the same at that of prior studies because accounting and tax systems are different in each country. We should thoroughly study the estimation method that best suits each country. Second, we did not analyze whether the accounting system or the tax system influences earnings quality to a greater extent. These are the challenges for future research.

ENDNOTES

1 Many managers face several incentives for earnings management. We think that bonus plan, debt contracts, political cost, and beat earnings benchmarks are examples of incentives for financial purpose earnings management. Tax avoidance is an example incentive for tax purpose earnings management. For example, Scholes et al. (1992), Guenther (1994), Maydew (1997), and Lopez *et al.* (1998) revealed that managers shifted their earnings to other periods for tax avoidance. Moreover, they also revealed that the magnitude of the income shifting is different by the debt ratio and firm size. Shackelford and Shevlin (2001) survey the accounting tax research.

2 In the United States, working capital accrual and accrual with relatively high book-tax conformity is almost identical.

3 Baez-Diaz and Alam (2013) indicate that DBOA, DBTA, NBOA, and NBTA (they are used by Calegari, 2000) result in mispricing. DBTA and NBTA particularly result in mispricing. However, the authors did not investigate the value relevance of these accruals.

4 The public disclosure of taxable income required by companies was abolished in 2006. Therefore, this study used data from the financial year 2004 (April 2004 to March 2005).

5 Large accruals are defined if the absolute values of each accrual are 25% of the highest ranking for each year.

6 Manzon and Plesko (2002) discuss BTD in the United States. In the United States, BTD is also caused by consolidated grouping.

7 In the sample used in this paper, the standard deviation of DBTA (DBOA) was 0.041 (0.015); the standard deviation of operating cash flow (normalized by total assets) excluding the accruals from the pre-tax net income was 0.064. According to the characteristics of the sample used in this paper, the ratio of the noise and economic performance is assumed to be 2:3. Equation (5) is true when f is greater than -0.36.

8 We used 22 industries that were reclassified based on the Nikkei industry classification.

9 The growth rate of revenue is defined as the difference between revenue t + 1 and revenue t, divided by revenue t.

10 We adjust the value of k to be $1 \geqq k \geqq 0$.

11 Francis and Schipper (1999) indicate that there are some regression models concerning value relevance. Models using a change in accounting income are reflected by revisions in the accounting standards and tax system. Additionally, these models add complexity to dummy variables. Therefore, we adopted the described model.

12 Public disclosure of taxable income was abolished in 2006. Therefore, we use data up to 2005 (fiscal year 2004) when taxable income is available.

13 Hayn (1995) noted that there is a correlation between the ERC and performance. In the current paper, we eliminated the firms that do not account for 40 million yen for the last two consecutive years, and we do not include a substantial amount of companies with a loss in the sample.

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