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Discretionary Earnings Management through Accounting Accruals in Response to Anticipated Corporate Tax Rate Changes

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Abstract

This study analyzes whether the accounting earnings of Japanese firms are managed in response to anticipated changes in the statutory corporate income tax rate. The amendments of the corporate tax code in 1988 reduced the corporate tax rate from 42 percent to 40 percent in 1990 and from 40 percent to 37.5 percent in 1991. If managers had attempted to maximize their firms' value by minimizing tax costs, these tax rate reductions would have provided a substantial incentive to defer reporting earnings. While the reduction in corporate income tax rate provided an incentive for managers to decrease financial statement earnings in the preceding year of the effective date of the amendments of the tax code, other incentives to increase financial statement earnings might have made it costly for managers to do so. For this reason, some firms may have chosen to forgo current tax savings in order to avoid reducing financial statement income. The results of this study show significantly lower discretionary accruals for the firms with good performance, which give priority to tax planning, in the preceding year of the tax rate reduction. These accruals are associated with performance. This study provides evidence of the management of financial statement earnings in response to the reduction of the statutory corporate income tax rate. The results are expected to be interest to tax policy decision makers, since the ability of corporate managers to engage in tax savings through earnings management can affect the estimation of tax revenue, as well as effects of tax law changes.

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I. Introduction

The taxes paid by a firm are costs for all interested parties, except for the tax authorities. It is supposed that rational stakeholders put pressure on managers to reduce tax costs in order to maximize the after-tax cash flows of the firm. As a result, managers are likely to be induced to decrease taxable income. For instance, if it is known that the corporate income tax rate will be reduced in the future, managers will be motivated to defer taxable income.

The Japanese corporate tax code requires the principle of the definite settlement of accounts (PDSA). PDSA leads Japanese firms to conform their taxable income to their financial statement earnings according to Japanese commercial law. In other words, PDSA works as a conformity rule¹. Under this conformity rule, reduction of taxable income causes a decrease in financial statement earnings and imposes a disadvantage on managers. The behavior of managers to reduce taxable income depends on whether the financial statement earnings are sufficient to do or not.

The amendments of the corporate tax code in Japan, in 1988, reduced the corporate tax rate from 42 percent to 40 percent in 1990, and from 40 percent to 37.5 percent in 1991. This study shows the response of managers to the anticipated reduction of corporate tax rates. Section II develops our hypotheses. Section III describes the sample selection and data collection procedures and the definitions of the variables. Section IV presents the univariate and the multivariate results. Section V summarizes our conclusions.

II. Earnings Management and Tax Rate Change

II.1. Tax Consequences and Non-tax Consequences

Under the conformity rule, financial statement earnings must be consistent with taxable income. Variations in the financial statement amount directly influence a firm's after-tax cash flows through the variations in taxable income amount under that rule. We call the

1. For a discussion of the property of PDSA as the conformity rule, see Suzuki (1998).

influence of financial statement earnings on after-tax cash flows *tax consequences*. Rational managers can estimate the magnitude of tax consequences. Managers can also control these in the future to some extent. Thus, managers are motivated to shift financial statement earnings to a certain amount in order to get the most tax advantageous consequences. Such behavior, that is *earnings management*, is one of the most important aspects of tax planning.

Tax planning might be developed to reduce financial statement earnings to minimize tax costs if the tax authorities were the only stakeholder. However, stakeholders actually consist of not only tax authorities but also shareholders, creditors, vendors, customers and so on. In such a typical situation, reducing financial statement earnings may not necessarily be tax advantageous planning. An extreme reduction of financial statement earnings causes difficulties in financing or trading so that transaction costs may increase. *Reporting costs* occur when accounting income is reported to outsiders. Extremely low financial statement earnings raise reporting costs, for instance capital costs. Since financial statement earnings have not only tax consequences but also non-tax consequences, managers cannot pursue only the tax consequences even though the advantage of these tax consequences is significant. Minimizing tax costs decreases overall after-tax cash flows when the non-tax disadvantage is greater than the tax advantage. Therefore, managers must trade off the tax consequences and the non-tax consequences in tax planning to minimize overall costs (Guenther et al., 1997; Klassen, 1997).

II.2. Order of Priority of Tax Planning and Financial Reporting

A single statutory tax rate is applied to all firms in all industries with the following exceptions².

- 1) A certain statutory tax rate is applied when the taxable income is positive, but the applied tax rate is zero when the taxable income is zero or negative. The subsidiary from governments, what is called "negative tax," is not allowed.
- 2) Firms which paid tax in the preceding year can get refunds to the

2. Besides these exceptions, the reduced tax rate is applied to small companies in Japan.

extent of the preceding payment when taxable income is negative in the current year. This is called *refund by carry-back of net operating losses*.

- 3) When taxable income of a firm is negative, in other words, the firm has losses, it can carry them over for five subsequent years and deduct them from future taxable income. These losses carried over are called *net operating losses carried over*.

These exceptional rules result in a variety of marginal tax rates. Managers' incentives in tax planning vary according to the anticipated taxable income. Managers are interested in the reporting costs and focus their minds on only the non-tax consequences rather than the tax consequences when they anticipate that the current taxable income will be negative. Also, managers whose firms have net operating losses carried over do not consider the tax consequences because they are exempted from tax payments. The poorly performing firms with negative taxable income or net operating losses carried over attach importance to financial reporting rather than tax planning. We call such firms "firms giving priority to financial reporting (FR firms)."

On the other hand, the regular statutory tax rate is applied to firms whose anticipated taxable income is positive and who have no net operating losses carried over. Tax planning becomes important in such firms. Managers of such firms must trade off the tax consequences and the non-tax consequences to maximize after-tax cash flows. Among these firms, there are sufficiently well performing firms that need not be worried about reporting earnings. A little reduction in the financial reporting earnings of the firms whose financial reporting earnings are *sufficiently* large causes neither obstacle in the business relations and financing nor problem in the performance evaluations and the dividend policy making. The importance of tax planning increases in such firms under these circumstances. We call these firms "firms giving priority to tax planning (TP firms)."

The performance of FR firms is bad, and that of TP firms is good. Table 1 indicates this relationship. The incentives of managers are different in TP firms and FR firms. Managers of FR firms are motivated to increase financial reporting earnings (accelerate income recognition). On the contrary, those of TP firms decrease financial reporting earnings (defer income recognition). Although both groups of firms face the same financial reporting environment under the same

taxation system, their incentives for choosing accounting methods or for making accounting judgments are in opposition to each other. In this paper, we examine the influence of the difference of the managers' incentives to their choice of accounting methods and accounting judgments.

Table 1 The Relationship between Tax Consequences and Non-tax Consequences

	Tax Consequences	Non-tax Consequences	Firm Type
Firms with anticipated large incomes	Large	Small	TP firm
Firms with anticipated losses or net operating losses carried over	Small	Large	FR firm

II.3. Tax Rate Change and Tax Planning

The amendments of the corporate tax code in 1988 reduced the statutory corporate income tax rate from 42 percent for retained income (32 percent for income paid as dividends) to 40 percent for retained income (35 percent for income paid as dividends), effective for taxable years beginning on or after 1 April 1989, and from 40 percent for retained income (35 percent for income paid as dividends) to 37.5 percent for both retained income and dividends paid, effective for taxable years beginning on or after 1 April, 1990. Deferring ¥1,000 of taxable income from the year in which it would be taxed at the pre-amendment rate to the following year, in which it would be taxed at the mid-amendment rate, would be equivalent to earnings of ¥34.5 [$= (\text{¥}1000 \times 0.42 - \text{¥}1000 \times 0.4) / (1 - 0.42)$]. Similarly, deferring ¥1,000 of taxable income from the year in which it would be taxed at the mid-amendment rate to the following year, in which it would be taxed at the post-amendment rate, would be equivalent to earnings of ¥41.7 [$= (\text{¥}1000 \times 0.4 - \text{¥}1000 \times 0.375) / (1 - 0.4)$]. If managers attempt to minimize the tax costs of the firm, these tax rate reductions provide a substantial incentive for the management of taxable income.

The issue of a statutory tax rate change had been discussed in the Diet for a long time, and the effective date and other details were

determined before the effective date itself. Thus, managers could anticipate the influence of the tax rate change in advance, and were able to develop a tax plan taking into consideration of the tax rate change. When the tax rate is to be raised, managers want to shift income from the year after the effective date to the year prior to the effective date and apply the old lower tax rate to the accelerated income so that the tax costs will decrease. When the tax rate is to be reduced, they want to shift income from the year prior to the effective date to the year after the effective date and apply the new lower tax rate to the deferred income so that the tax costs will also decrease.

The response of managers to a change in the tax rate might be different between FR firms and TP firms. The consequences of financial reporting are more important than the tax consequences in FR firms, which are sufficiently poorly performing firms. Thus, managers, who are motivated to increase financial statement earnings or reduce losses, do not defer income to the following year even though the tax rate is to be reduced in that year. On the contrary, managers need not to be worried about some decrease of financial reporting earnings in TP firms whose performance is sufficiently good and anticipated income is sufficiently large. Since the point of decision-making is tax saving in TP firms, managers must defer income from the year preceding the tax rate reduction to the year after the tax rate reduction in order to minimize tax costs when the tax rate is to be reduced.

II.4. The Relationship between Management of Taxable Income and Financial Reporting Earnings

Since taxable income can not be directly observed by researchers, the focus of this study is the management of financial statement earnings. The issue addressed is whether the deferral of revenues or acceleration of expenses for tax purposes also results in changes to financial statement pre-tax income.

The taxable income amount tends to be similar to the financial statement earnings amount in Japanese firms because of the principle of the definite settlement of accounts (PDSA). PDSA requires that a firm should make the closing accounts in accordance with the commercial law as a basis for preparing its tax return. Under PDSA, firms and tax authorities can reduce costs of tax payment, those of tax

collection and political costs by conforming financial statement earnings to taxable income³. Therefore, firms, if rational, tend to conform the accounting treatments for financial reporting purposes to those for tax purposes. PDSA works as a conformity rule.

Under PDSA, deductibility of accrued expenses for tax purposes appears to be a sufficient but not a necessary condition for the accrual of expenses for financial reporting purposes. Thus, it is expected that managers who want to accelerate accrued expenses for tax purposes will likely accelerate financial statement expenses as well. Similar to acceleration of expenses, managers can also defer taxable income by deferring the recognition of revenues. A manager attempting to defer taxable income will defer the recognition of revenues by delaying the occurrence of all events that determine a taxpayer's right to receive these revenues, for instance, by delaying shipments of goods so that the title will not have passed at the year-end. By delaying a taxpayer's right to receive the revenues, the revenue would not be realizable nor earned at the year-end for financial accounting purposes; therefore, the revenue recognition would also be deferred in the financial statements. Like the treatment of expenses, deferral of revenues for tax purposes appears to be a sufficient but not a necessary condition for deferral of the revenue for financial statement purposes as well.

II.5. Earnings Management and Accounting Accruals

Accounting earnings are the differences between revenues and expenses. Thus, managers have to defer or accelerate revenues or expenses, or both, in order to shift earnings from one year to another. Accelerating revenues or deferring expenses can raise the current earnings. Deferring revenues or accelerating expenses can, on the other hand, reduce the current earnings. Such intentional adjustment of the recognition of revenues and expenses is called the discretionary earnings management.

Discretionary earnings management is classified into two categories. One is real earnings management accomplished by timing

3. For further details of the reasons why the conformity of financial statement earnings to taxable income reduces some costs, see Suzuki (1998).

investment, financing decisions or other transactions. The other is accruals-based earnings management. In the accruals accounting system, accounting earnings are determined in the process that current cash flows are adjusted by accrual, deferment and allocation through applying accounting methods and making accounting judgments.

These adjustments create accounting accruals. Current accounting earnings under an accruals accounting system consist of current cash flows from operations and accounting accruals as follows;

$$AE = CF + TAC$$

$$\text{then, } TAC = AI - CF$$

where:

AE=accounting earnings,

CF=cash flows from operations,

TAC=accounting accruals.

Previous research on earnings management has focused primarily on accounting accruals. When we concentrate our attention on accounting accruals in the analysis of earnings management, real earnings management is left out of the analysis⁴. Since the cash flows are given, we cannot identify the earnings management due to shifting cash flows. As far as the analysis of accruals-based earnings management is concerned, however, accounting accruals provide a useful tool of analysis. This is because the accruals accounting system integrates the changes of accounting methods and the intentional factors of accounting estimations and judgments into the accounting accruals. In other words, the accounting accruals are a comprehensive combination of the essential procedures required in accruals accounting system.

Previous research by Guenther (1994) analyzes accruals-based earnings management in response to the tax rate change focusing on accounting accruals. The results show that large firms and firms with low leverage tend to defer the reporting of earnings. Guenther (1994), however, does not indicate the difference in earnings management between TP firms and FR firms, since its samples exclude the firms which are influenced by the alternative minimum tax and have net operating losses.

4. Scholes et al. (1992) analyzes the real earnings management in response to the tax rate change in the Tax Reform Act 1986 in the US.

II.6. Measurement of Discretionary Accounting Accruals

According to Healy (1985), accruals modify the timing of reported earnings and are composed of discretionary accruals (DAC), that enable a manager to shift earnings to some other period, and of non-discretionary accruals (NAC), that are mandated by accounting standard-setting bodies.

$$TAC = NAC + DAC$$

where:

TAC = total accounting accruals,
 NAC = non-discretionary accruals,
 DAC = discretionary accruals.

The discretionary elements which occur from the choice of accounting methods and accounting judgments are integrated into the accounting accruals. We focus on the accounting accruals. TP firms reduce discretionary accruals in the preceding year of a tax rate reduction and raise them in the year of the tax rate reduction in to defer income order to save tax costs. FR firms raise the discretionary accruals in the preceding year of a tax rate reduction and reduce them in the year of the tax rate reduction because they have an incentive to accelerate income. If the discretionary accruals are compared between TP firms and FR firms, the discretionary accruals of TP firms are, at least, less than those of FR firms in the preceding year of the tax rate reduction, and the discretionary accruals of TP firms are greater than those of FR firms in the year the tax rate is reduced.

Development of Hypothesis

The managers of TP firms are expected to defer income from the year preceding the tax rate reduction to the rate reduction year in anticipation of a reduction in the tax rate. When the managers shift income through changing accounting methods and manipulating accounting judgments, the discretionary accounting accruals in the immediately preceding year of the tax rate reduction will decrease and the discretionary accounting accruals in the year of the tax rate reduction will increase. On the other hand, managers of FR firms, who have an incentive to increase reporting earnings, will be expected not to

defer income in anticipation of a reduction in the tax rate. These assumptions lead to the following hypothesis.

- H: Compared with FR firms, TP firms have less discretionary accounting accruals in the preceding year of a tax rate reduction and greater discretionary accounting accruals in the year of tax rate reduction.

III. Sample Selection and Research Design

Examined Periods

The step by step corporate income tax rate decrease from 1989 through 1992 in Japan is shown in Table 2. For a firm with a March 31 year-end, the tax rate for retained income was 42 percent in the year ending March 1989, 40 percent in the year ending March 1990, and 37.5 percent in the year ending March 1991⁵. The tax rate for income paid as dividends, however, rose from 32 percent in the year ending March 1989, to 35 percent in the year ending March 1990, and to 37.5 percent in the year ending March 1991. Most Japanese firms' pay-out ratios were low at those times. The Ministry of International Trade and Industry reported that the average pay-out ratio for all industries was 32.63 percent in 1989 and 32.40 percent in 1990 (Ministry of International Trade and Industry, 1991 and 1992). Assuming that the pay-out ratio was 32.50 percent, the reduction was realized as 0.375 percent $[=(40-42) \times (1-0.325) + (35-32) \times 0.325]$ in the year ending

Table 2 The Reduction of the Corporate Income Tax Rate

Years	Retained Income	Dividends
Year beginning until March 31 1989	42%	32%
Year beginning from April 1 1989 to March 31 1990	40%	35%
Year beginning after April 1 1990	37.5%	

5. Most large Japanese companies have a March business year-end.

March 1990 and as 0.875 percent $[(37.5-40) \times (1-0.325) + (37.5-35) \times 0.325]$ in the year ending March 1991. Therefore, most firms might have received a reduction.

Since the revised tax code which reduced the tax rate in the year ending March 1990 ($t=0$) and in the year ending March 1991 ($t=+1$) was enacted in December 1988, managers could have followed three kinds of tax plan in March 1989 ($t=-1$).

- 1) In $t=-1$, make a tax plan to decrease DAC_{-1} (to decrease income in $t=-1$) and to increase DAC_0 (to increase income in $t=0$). Then, in $t=0$, make a tax plan to decrease DAC_0 (to decrease income in $t=0$) and to increase DAC_{+1} (to increase income in $t=+1$), respectively.
- 2) In $t=-1$, make a tax plan to decrease DAC_{-1} , then to increase $DAC_0 + DAC_{+1}$ in total for the two subsequent years.
- 3) In $t=-1$, make a tax plan to decrease DAC_{-1} , then to increase either DAC_0 or DAC_{+1} in $t=0$ or $t=+1$.

Tax plan (1) above has contradiction. Tax plan (2) is inconsistent with reality. It is difficult to control the realization of rebounds of discretionary accruals, which usually occur in the year following discretionary earnings management, for two years⁶. The question involved in the tax plan (3) is whether the rebounds of the discretionary accruals occur in $t=0$ or $t=+1$. They are supposed to be likely to occur in $t=0$ rather than $t=+1$. This is because the longer a forecast term is, the more future prediction is uncertain so that the step in $t=0$ is given priority over that in $t=+1$. Additionally, $t=+1$ was the peak of the economic cycle in Japan. This unusual boom was not expected to last so long so that far fewer firms would have made a tax plan containing $t=+1$ since it was difficult to predict in the long term. Therefore, we focused the test periods on the year prior to the first tax rate reduction, that is the year ending March 1989 ($t=-1$), and the year of the first tax rate reduction, that is the year ending March 1990 ($t=0$).

Sample Selection and Data Collection

We examined how the managers of TP firms managed accounting

6. This is also inconsistent with the assumption of random walk as we will see in our discussion on the determination of the discretionary accruals.

accruals in response to the tax rate reduction for years beginning from April 1, 1989. At first, we created an FR firms' group, which is a control group, because, as FR firms have operating losses or bad performance, the data of FR firms is less than that of TP firms. Then, we created a TP firms' group as the test group by the matched-pair design.

We selected samples according to the following procedures, collecting data (*individual financial statements A*) from the Japan Development Bank Corporate Financial Data Bank.

- 1) We tested the firms for year ending March 1989 and ending March 1990, excluding banks and insurance corporations. We derived all firms that had pre-tax losses in any period between the year ending March 1987 and March 1991⁷. Then, we aggregated pre-tax income or losses from the first year in which net operating losses occurred to the year ending March 1991, and considered the firms whose aggregate amounts were negative as the firms with net operating losses carried over in March 1989 and 1990. This left 85 firms as FR firms candidates.
- 2) We excluded firms who were merging with other companies or changing their business year during the test periods. There were 73 firms identified as FR firms. The amount of the mean estimated net operating losses carried over was ¥4,093 million.
- 3) TP firms were matched with FR firms identified in step 2. We derived all firms that did not experience the occurrence of pre-tax losses in any period between the year ending March 1987 and March 1991. The influences from the difference in years were controlled for by matching TP firms with FR firms in the same years.
- 4) Since FR firms must have *sufficiently* large income, we left firms whose ratio of after-tax income to sales was more than 3 percent in the year ending March 1989.
- 5) We excluded firms who were merging with other companies or changing their business year during the test periods.
- 6) We classified the firms in step 2 and 5 according to the four-digit Japan Development Bank Industrial Code (JDBIC). Then a TP firm

7. In Japan, firms can carry back losses to the previous year or carry over losses to five subsequent years for tax purposes.

is chosen at random among the same four-digit JDBIC of TP firms as that of each FR firm. If no four-digit JDBIC firm match was identified, the same procedure was performed to identify a TP firm with the same three-digit JDBIC. If no three-digit match was identified, the same procedure was performed to identify a two-digit JDBIC. If no two-digit match was identified, the same procedure was performed to identify a one-digit JDBIC. These procedures removed the influences of the difference in industries. The TP firms' group consisted of 31 firms within the four-digit JDBIC, 12 within the three-digit JDBIC, 13 within the two-digit JDBIC and 17 within the one-digit JDBIC. The sample size of TP firms is 73, which is the same number as those of FR firms. The mean ratio of after-tax income to sales in the TP firms' group was 7.7 percent.

Variable Definitions

Discretionary Accruals

Total accruals (TAC) are defined according to Healy (1985) as follows:

$$TAC_t = \Delta AR_t + \Delta INV_t - \Delta AP_t - \Delta TP_t - DEP_t,$$

where:

ΔAR_t = accounts receivable in year t less accounts receivable in year $t-1$;

ΔINV_t = inventory in year t less inventory in year $t-1$;

ΔAP_t = accounts payable in year t less accounts payable in year $t-1$;

ΔTP_t = income taxes payable in year t less income taxes payable in year $t-1$;

DEP_t = depreciation in year t .

The measure of the discretionary accruals (DAC) used is based on DeAngelo (1986) as follows;

$$DAC_t = TAC_t - TAC_{t-1}.$$

The dependent variable is DAC_t deflated by the end-of-year total assets (A_{it}) to reduce heteroscedasticity.

The discretionary accruals can be identified by other methods. Jones (1991) and Dechow et al. (1995) estimated the regression model

of non-discretionary accruals and identified the discretionary accruals as the residuals of the regression. Such methods need sufficient long-term stability for estimating the prediction model. The tax code, however, often changes the corporate tax rate in Japan, from 36.75 percent to 40 percent in 1974, to 42 percent in 1981, to 43.3 percent in 1984 and to 42 percent in 1987. For this reason, we cannot take a sufficiently long term for estimating the prediction model. Therefore, we suppose that non-discretionary accruals are subject to a simple random walk and adopt the DeAngelo (1986) model.

Size

Since the political costs become higher in proportion to the size of the firm, large firms are more sensitive to political costs. Therefore, the larger a firm is, the more likely it is to choose accounting procedures or make accounting judgments that defer reported earnings from current to future periods (Watts and Zimmerman, 1986). We took the natural logarithm of the end-of-year total assets as the proxy variable for firm size to control for the influence of firm size.

Leverage

Firms with high leverage tend to be under pressure from creditors and the managers are likely to be restrained by financial covenants. Many financial covenants impose maintenance of a certain level of earnings and dividends. Thus, the larger a firm's debt/equity ratio is, the more likely the firm's manager is to select accounting procedures that shift reported earnings from future periods to the current period (Watts and Zimmerman, 1986). We used leverage, measured as long-term debts deflated by total assets at the year end, to control the influence of the debt/equity ratio.

Ownership

Shareholders are interested in their firm's value, that is after-tax cash flows, rather than reporting earnings (Sakurai, 1988). A shareholder who has great influence over the management might put pressure on the manager to reduce tax costs. Therefore, the greater the percentage of the firm owned by a certain shareholder is, the more likely the firm is to defer reporting earnings to the year with tax rate reduction. We took the equity ratio of minority shareholders, which is

found in *Nikkei Company Information III in 1989*, as the proxy for ownership⁸.

IV. Results

IV.1. Univariate Tests

Table 3 presents the descriptive statistics on the discretionary accruals in TP firms and FR firms. The hypothesis predicts that the sign of TP firms' discretionary accruals is negative in the year ending March 1989 and positive in the year ending March 1990, and the sign of FR firms' discretionary accruals is positive in the year ending March 1989 and negative in the year ending March 1990. However, the results actually show that both the mean and median of the discretionary accruals in TP firms are positive in the year ending March 1989 and negative in the year ending March 1990.

Table 3 Descriptive Statistics of Discretionary Accruals

	Year Ending March 1989		Year Ending March 1990	
	TP firms	FR firms	TP firms	FR firms
Means	0.080	0.140	-0.081	-0.178
(t-statistic)		(-3.033)		(4.012)
(p-value)		(0.00146)		(0.00005)
Variances	0.010	0.019	0.012	0.030
Medians	0.062	0.110	-0.065	-0.152
(U-statistic)		(-3385)		(3534)
(p-value)		(-0.0024)		(0.0014)
Maximum	0.556	0.596	0.092	0.088
Minimum	-0.059	-0.056	-0.445	-0.661

8. The equity ratio of minorities means the percentage of fixed shares to outstanding shares. Fixed shares are defined as the shares held by the top 10 shareholders less those which are not obviously fixed (Nihon Keizai Shimbun-sha, 1989).

However, the extent of discretionary accruals of TP firms is less than that of FR firms in the year ending March 1989, and the difference is significant in both the t-test and the Wilcoxon-test. This means that TP firms increase income less than do FR firms. On the other hand, the extent of discretionary accruals is less in TP firms than in FR firms in the year ending March 1990, and the difference is also significant in both the t-test and the Wilcoxon-test. This means that TP firms decrease income less than do FR firms.

IV.2. Multivariate Tests

We evaluated the correlation coefficients among all variables to check multi-collinearity before estimating the relationship among the variables. Then, an ordinary least square regression model was used to test the hypothesis. The model tested is:

$$DAC_t/A_t = \beta_0 + \beta_1 TP_t + \beta_2 SIZE_t + \beta_3 LEV_t + \beta_4 SHARE_t + \varepsilon$$

where:

DAC_t =discretionary accounting accruals in year t,

A_t =Total assets at the end of year t,

TP_t =dummy variable; 1 if firm is a TP firm, and 0 if not in year t,

$SIZE_t$ =firm size; the natural logarithm of total assets at the end of year t,

LEV_t =leverage; long term debts/total assets at the end of year t,

$SHARE_t$ =ownership,

$\beta_1, \dots, \beta_4$ =coefficients associated with the explanatory variables.

Since TP firms would defer income in the high tax rate year ending March 1989 ($t=-1$), DAC_{-1}/A_{-1} was expected to shift down. Thus, we expected that the sign of β_1 would be negative. On the other hand, as the deferred income carried over from the preceding year would be realized in TP firms in the year of the low tax rate ending March 1990 ($t=0$), we expected that DAC_0/A_0 would shift up and that the sign of β_1 would be positive.

The results presented by Table 3 suggest that non-tax factors should be controlled. To control for the influences of firm size, leverage

and ownership on earnings management, we constructed a multiple regression model to include these variables. Table 4 presents the correlation coefficients among all variables. Table 4 shows that the correlation of SIZE and SHARE is strong. Therefore, two models are used for the test: one including and the other excluding SHARE.

Table 4 Correlations of Variables

	DAC/A	TP	SIZE	LEV
TP	-0.245 (-3.03)			
SIZE	-0.191 (-2.33)	0.242 (2.99)		
LEV	-0.301 (-3.79)	-0.316 (-3.99)	0.060 (0.72)	
SHARE	-0.019 (-0.23)	-0.289 (-3.62)	-0.462 (-6.25)	0.202 (2.48)

Parentheses show the t-statistic.

Table 5 OLS Results

Variable	Year ending March 1989		Year ending March 1990	
Intercept	0.387 (3.87)	0.300 (4.28)	-0.581 (-4.75)	-0.415 (-4.81)
TP	-0.090 (-4.50)	-0.087 (-4.37)	0.115 (4.76)	0.107 (4.47)
SIZE	-0.011 (-1.48)	-0.007 (-1.04)	0.022 (2.42)	0.015 (1.76)
LEV	-0.326 (-4.83)	-0.343 (-5.18)	0.369 (4.14)	0.380 (4.24)
SHARE	-0.089 (-1.21)	—	0.167 (1.90)	—
R ²	0.233	0.225	0.260	0.241
Adjusted R ²	0.211	0.208	0.239	0.225
F-statistic	10.692	13.718	12.365	15.014

Parentheses show the t-statistic.

Table 5 shows the results of the OLS tests. Where the sign of β_1 is negative, that means a decrease in the discretionary accruals, in the year ending March 1989. In contrast, where the sign of β_1 is positive, that means an increase in discretionary accruals, in the year ending March 1990. Therefore, when firm size, leverage and ownership are controlled, TP firms are likely to decrease income in the preceding year of the tax rate reduction and increase income in the tax rate reduction year. This is consistent with the hypothesis.

V. Conclusion

The accounting policies of firms reflect not only tax factors but also other factors such as the actions of creditors, shareholders and governments. Therefore, firms do not necessarily choose accounting methods or make accounting judgements to minimize taxes. Firms facing a high marginal tax rate, however, might choose accounting methods or make accounting judgements to reduce taxes because tax costs are significant in such firms.

We investigated firms' responses to the corporate tax rate reduction in 1990, focusing on the discretionary accruals, in order to test this hypothesis. As a result, we found supporting evidence that well performing firms facing a high marginal tax rate are likely to defer income from the year of the high tax rate to the low tax rate compared with poorly performing firms facing a low marginal tax rate.

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