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Identifying Tax-Induced Earnings Management Around TRA 86 as a Function of Prior Tax-Aggressive Behavior

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ABSTRACT

This study extends previous research examining how conflicts between tax and financial reporting are resolved. A variable reflecting a firm's propensity to engage in tax-minimizing behavior is developed to augment previous models used to explain shifts in discretionary current accruals resulting from the tax rate reductions contained in the Tax Reform Act of 1986 (TRA 86). The paper provides evidence consistent with the following predictions: (1) the probability of making a negative discretionary current accrual shift in the year prior to the tax rate change is directly related to tax-aggressiveness; (2) tax-aggressive firms will make greater negative discretionary current accrual shifts in the year prior to the tax rate reduction than other firms; and (3) the magnitude of the shift in negative discretionary current accruals is a function of the rate change faced by the firm.

BACKGROUND AND MOTIVATION

This study extends prior work examining possible determinants of firms' decisions to minimize income taxes when faced with nontax costs associated with tax minimization (Scholes and Wolfson 1992). The nontax costs examined in this study arise when the management of taxable income has a similar effect on financial reporting (book) income. While firms generally wish to report low levels of taxable income to the taxing authority, they are also concerned about the level of reported earnings. Managers who engage in this form of tax-induced earnings management typically trade off potential tax savings with reductions in book income and stakeholder wealth.[1] Thus, the simple decision rule of seeking to minimize taxes is not always the efficient choice (Scholes and Wolfson 1992, 127). This study provides a clearer understanding of the resolution of this conflict between tax and financial reporting by examining the prevalence of tax-minimizing behavior in response to

[1] Tax-induced earnings management may adversely affect management with compensation contracts tied to accounting numbers. Equity shareholders may also be adversely affected if the firm is unable to effectively communicate the value implications of tax-induced earnings management to financial analysts and other external investors (Healy and Palepu 1993).

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income tax rate changes during the implementation period of the Tax Reform Act of 1986 (TRA 86). This objective is facilitated by the use of an explicit tax subsidy measure (TAXAG) which proxies for a firm's propensity to engage in tax-aggressive behavior.

The effect of tax rate changes in TRA 86 on financial reporting behavior has been analyzed in three previous studies (Scholes et al. 1992; Guenther 1994; Maydew 1997). In all three cases, TRA 86's relatively large reduction in the top statutory marginal corporate income tax rate from 46 percent to 34 percent was viewed as providing a productive setting in which to examine firms' responses to mandatory tax rate changes. Scholes et al. (1992) examine the magnitude of the rate change and the size of the firm in explaining unanticipated shifts in gross margins in quarters surrounding the decrease in rates. Their evidence indicates that large firms shifted some portion of gross margin to the quarter following the decrease in tax rates, but there is no corresponding evidence for small firms. Maydew (1997) examines cross-sectional variation in income shifting resulting from TRA 86 for firms with net operating loss (NOL) carrybacks. His results indicate that firms with larger tax incentives (due to the timing of the tax rate change and fiscal year-end) had a greater propensity to shift income, while firms with large amounts of investment tax credit (ITC) and/or leverage were less willing to shift. Unlike Scholes et al. (1992), size did not appear to affect the propensity to shift income.

Guenther (1994) examines the ability of the tax rate change, firm size, level of debt, and degree of management ownership to explain abnormal shifts in current accruals in the periods surrounding the rate change. Consistent with his hypotheses, the results indicate that large calendar year-end firms had negative (i.e., income-decreasing) current accrual shifts in the year prior to the TRA rate reduction, and that shifts in current accruals were positively related to leverage. His results do not provide evidence that firms with fiscal year-ends in May, June, or July (hereafter, fiscal year-end firms) are more likely than calendar year-end firms to have negative current accrual shifts in the year preceding the TRA rate reduction.

This inability to detect accrual shifts for fiscal year-end firms is difficult to explain. The timing of the rate reduction in TRA 86 was a function of fiscal year-end.[2] For calendar year-end firms the 12 percent rate reduction was taken in two 6 percent increments in 1987 and 1988. Fiscal year-end firms, however, received the entire 12 percent reduction in fiscal year-end 1988 (June year-ends), or 11 percent in fiscal year-end 1988 (for May and July year-ends).[3] If earnings were managed in response to the magnitude of tax rate changes, the differing schedule of rate changes based on fiscal year-ends would create different incentives to manage earnings across firms. Seemingly, an 11 or 12 percent rate reduction for a May, June, or July fiscal year-end firm would provide a greater economic incentive to shift income and expense than a 6 percent reduction for a calendar year-end firm. However, Guenther (1994, tables 2 and 3) reports that calendar year-end firms made discretionary income-decreasing accrual shifts in the year prior to the tax rate change, while fiscal year-end firms did not.[4] This result suggests either that fiscal year-end firms are less opportunistic tax planners than calendar year-end firms, or research design limitations obscure the tax-motivated behavior of Guenther's sample firms.

This study builds on Guenther (1994) and provides three research design enhancements in an attempt to resolve this enigma. First, our measure of discretionary current accruals (which proxies for earnings management) uses items that have a more identifiable and manageable effect on taxable income. Second, we incorporate a more powerful model of earnings management developed in Dechow et al. (1995) which should enhance the model's ability to detect tax-related earnings

[2] A more extensive explanation of the rate changes is provided below and in Guenther (1994, 234).

[3] May year-end firms received the other 1 percent reduction in fiscal year-end 1989. July year-end firms received the other 1 percent reduction in fiscal year-end 1987.

[4] One objective of this study is to examine whether the magnitude of a tax rate change is associated with the magnitude of discretionary current accrual shifts. Accordingly, for purposes of this study "fiscal year-end firms" are defined as May, June, or July year-end firms, because these fiscal year-end firms experienced the highest magnitude tax rate change.

management. Third and most importantly, we explicitly incorporate in the test period model a proxy for the propensity of a firm to engage in tax-minimizing behavior (i.e., tax-aggressiveness, which we label TAXAG).

The indicator variable TAXAG is based on the tax subsidy measure developed in Wilkie (1992), that captures the notion that aggressive tax-minimizing firms have relatively higher explicit tax subsidies than other firms. These subsidies arise from use of both temporary differences (e.g., accelerated depreciation for tax purposes), and permanent differences (e.g., municipal bond interest income and foreign tax credits). Under the joint assumption that tax shields utilized (1) are important in assessing whether a firm is a tax minimizer, and (2) are reflected in the difference between a firm's actual current portion of income tax expense and what that amount would be if all income were taxed at the highest statutory rate, TAXAG coded one indicates more aggressive tax minimizers. We predict that such firms will be more likely than other firms to manage their earnings in response to the TRA 86 statutory tax rate cuts. Details on the development of TAXAG are provided in section three.

In addition to refining the research methodology for identifying tax minimization subject to nontax costs, this study may be of interest to policy makers in predicting whether earnings will be managed to take advantage of future tax rate changes, and to IRS authorities in enforcing tax rules designed to prevent abusive tax avoidance.[5]

The results of the study indicate that TAXAG is an important factor in identifying tax-motivated earnings management. The variable is significantly negatively correlated with discretionary current accruals for both calendar and fiscal year-end firms in 1986. Additionally, when the variable is included in tests using a pooled calendar and fiscal year-end sample, the results are consistent with fiscal year-end firms making greater negative accrual shifts than calendar year-end firms in the year preceding the initial TRA 86 rate reduction.

The remainder of this paper is organized as follows: section two provides the empirical predictions tested in the study, section three discusses issues in research design, section four contains the empirical results, and section five provides a summary and conclusion.

EMPIRICAL PREDICTIONS

The Relation Between Tax-Aggressiveness and Tax-Motivated Incentives to Manage Earnings

We anticipate a direct relation between our measure of tax aggressiveness and incentives to manage taxable income. Generally, firms with low TAXAG measures are unable to take advantage of tax shields provided in the tax code and the corresponding savings opportunities, or are less concerned with the effect of taxes on normal operations.[6] Conversely, firms with high TAXAG measures have displayed tax-minimizing behavior in the prior three-year period in taking advantage of tax shields; we presume these firms will be more concerned with tax rate changes available in TRA 86 than firms displaying low tax-aggressive behavior. This is the basis of the first hypothesis:

H1: More aggressive tax-planning firms have higher probabilities of making negative accrual shifts in the year preceding the TRA 86 tax rate reduction than other firms.

In addition to predicting differences in the probability of accrual shifting as a function of tax minimizing tendencies, we also predict magnitude differences in accrual shifting across firms differing in respect to tax-aggressive behavior:

H2: More aggressive tax-planning firms make greater negative accrual shifts in the year preceding the TRA 86 tax rate reductions than other firms.

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[5] The IRS has a backlog of audits that include transactions involving the shifting of income from one period to another (Scholes and Wolfson 1992, 19). The tax code contains broad rules that allow for recharacterization of such transactions if the sole purpose for the transaction was the avoidance of tax.

[6] Tax-motivated behavior incorporates a cost/benefit analysis on the part of each firm. To the extent that a firm exhibits little concern over taxes, it is likely due to this cost/benefit analysis.

The Effect of Transition Rules on Incentives to Manage Earnings

As noted in Guenther (1994) and discussed in the previous section, TRA 86 tax rate changes were fully realized over a two-year period (1987 and 1988), but were phased-in differently for calendar and fiscal year-end firms. *Calendar year-end firms received the 12 percent reduction in the statutory tax rate over two years*, with a 6 percent reduction in 1987 and a 6 percent reduction in 1988. For other year-ends, the rate was effectively reduced by 1 percent per month beginning with July 1987 (Guenther 1994, 234). Accordingly, June 30 year-end firms realized the entire 12 percent reduction in the fiscal year ending in June, 1988; July 31 year-end firms realized a 1 percent reduction in the year ending July 31, 1987, and an 11 percent reduction in the year ending July 31, 1988; and May 31 year-end firms realized an 11 percent reduction in the year ending May 31, 1988, and a 1 percent reduction in the following year. Therefore, *May, June, or July fiscal year-end firms realized an 11 or 12 percent reduction in rates in 1988.*

These rules present an opportunity to test the incentive to manage earnings created by the magnitude of a tax rate change. All else being equal, the larger one-year tax rate change faced by fiscal year-end firms should provide a greater incentive to shift current accruals than that faced by calendar year-end firms. Thus, barring uncontrolled systematic differences between fiscal and calendar year-end firms, we predict that:

H3: May, June, or July fiscal year-end firms will make greater negative accrual shifts in the year preceding the TRA 86 tax rate reduction than will calendar year-end firms.

Guenther (1994, 242) tests this prediction, but his evidence does not support rejection of a null hypothesis of no differential effect between fiscal and calendar year-end firms.

RESEARCH DESIGN

The research design measures discretionary current accruals, which provide a firm-specific proxy for earnings management. This variable is then regressed on independent measures which proxy for the effects of the predictions discussed in the previous section. This section discusses specific research design issues.

Proxying Earnings Management Using the Discretionary Portion of Current Accruals

To detect earnings management, prior researchers have utilized two types of measures. McNichols and Wilson (1988) is an example of a study which examines management of a single discretionary accrual or account (e.g., the provision for bad debts). Other articles (Healy 1985; Jones 1991; Guenther 1994), have used a portfolio approach to try to proxy the sum of all discretionary accruals components. In general, the first approach is capable of measuring earnings management with less noise than the second, but linkages between management of individual items and the effect on total income are tenuous, presumably because managers face a portfolio of such accrual choices (DeAngelo 1988).[7] On the other hand, the portfolio approach may be too inclusive if items that have no apparent tax effects are included in calculating the dependent variable. For example, a measure of current accruals equal to the change in noncash working capital, less changes in current maturities of long-term debt, and income taxes payable (as in Guenther 1994), includes items readily subject to tax-motivated management (e.g., accounts receivable and accounts payable) and others which have little or no potential effect on taxable income. In the latter category, for example, are security deposits, advances due from parents or from consolidated subsidiaries, deferred and prepaid taxes, dividends declared but not paid, allowances for uncollectibles, and the current portion of redeemable preferred stock. This study uses a portfolio approach in measuring earnings management, but limits the measure of earnings management to discretionary current accrual items more directly related to taxable income.

[7] This limitation renders, for example, the measure of earnings management used in Scholes et al. (1992) suspect in capturing the management of overall taxable income. The study separately evaluated gross margin and selling, general and administrative expense; however, evidence that one was managed in a particular direction does not allow a conclusion that the taxable income of the firm moved in the same direction.

Earnings management can be accomplished by a variety of means, including use of accruals, changes in accounting methods, or changes in capital structure (McNichols and Wilson 1988). In this paper we examine only management via current accruals. The primary reason for only examining accruals is that accruals are, in general, easier to manage over short time periods than are changes in accounting methods or capital structure. Additionally, to the extent a tax-minimizing firm is already using a tax-minimizing portfolio of accounting methods and capital structure, the potential for further tax-minimizing changes may be limited. Accrual choices, on the other hand, are easier to accomplish under these circumstances and will most likely not have been exhausted prior to the tax rate change (Cahan 1992). Management of discretionary accruals can be accomplished by changing procedures or estimates and/or shifting the timing of economic decisions to accelerate or defer income or expense.

Guenther (1994), citing Manzon (1992) and Choi et al. (1991), identifies current accruals as those accruals most likely to have an impact on taxable income. Additionally, Hunt et al. (1996) suggest that current accruals are more closely linked to book income and taxable income than noncurrent accruals. Accordingly, we limit our measure of earnings management to the portion of current accruals most directly related to taxable income. The measure of current accruals for firm i in year t ($CACC_{it}$) is:

$$CACC_{it} = (\Delta AR_{it} + \Delta INV_{it}) - (\Delta AP_{it} + \Delta AE_{it}) \quad (1)$$

where:

ΔAR_{it} = change in accounts receivable for firm i between t and t − 1,
ΔINV_{it} = change in inventory for firm i between t and t − 1,
ΔAP_{it} = change in accounts payable for firm i between t and t − 1,
ΔAE_{it} = change in accrued expenses for firm i between t and t − 1.

This measure of current accruals differs from measures used in previous studies of tax-related earnings management by only including items commonly susceptible to tax-related earnings management.[8] The measure provides more information than that provided by use of a single accrual, while narrowing the scope (and resulting noise) of previous, more inclusive, accrual proxies.

Measuring Discretionary Current Accruals

Guenther's (1994) model is based on the model developed in Jones (1991). That model assumes that in the absence of earnings management, nondiscretionary current accruals are a function of the change in sales:

$$NDA_{it} = \beta_i \Delta SALES_{it} + e_i \quad (2)$$

where:

NDA_{it} = nondiscretionary accruals for firm i in year t,
$\Delta SALES_{it}$ = change in sales for firm i between t − 1 and t, and
β_i = firm specific parameter.

Dechow et al. (1995) note that an assumption implicit in this model is that changes in sales are nondiscretionary. If earnings are managed through recording of discretionary sales, then the model utilized by Guenther (1994) will remove part of the managed earnings from the discretionary accrual proxy.[9] The Dechow et al. (1995) analysis suggests that models such as equation (2) orthogonalize current accruals with respect to sales and result in the estimate of earnings management being biased toward zero.

[8] Guenther (1994) begins with total current accruals and then eliminates items that are theorized to be less subject to earnings management (e.g., the current maturities of long-term debt). However, as noted previously, it is difficult to eliminate *all* items not subject to tax-related management due both to the number and aggregation of items in current assets and liabilities.

[9] Dechow et al. (1995,199) cite the following example of this problem:

> [C]onsider a situation where management uses its discretion to accrue revenues at year-end when the cash has not yet been received and it is highly questionable whether the revenues have been earned. The result of this managerial discretion will be an increase in revenues and total accruals.

To mitigate this problem regarding sales, Dechow et al. (1995) propose a modified version of the Jones (1991) Model. This Modified Jones Model is used in this study to model the nondiscretionary component of current accruals:

$$CACC_{it}/TA_{it-1} = \delta_{1i}/TA_{it-1} + \delta_{2i}(\Delta SALES_{it} - \Delta AR_{it})/TA_{it-1} + \epsilon_{it} \quad (3)$$

where:

$CACC_{it}$ = current accruals for firm i from period t − 1 to t,
$\Delta SALES_{it}$ = change in sales for firm i betweem t − 1 and t,
ΔAR_{it} = change in accounts receivable for firm i from t − 1 to t,
TA_{it-1} = total assets for firm i at time t − 1, and
δ_{1i}, δ_{2i}, = firm specific parameters.

The firm specific parameters δ_1 and δ_2 are estimated using OLS for each sample firm over the thirteen year period from 1972 through 1984. The mean R^2 from these regressions is approximately 30 percent, compared to the 23.2 percent R^2 reported in Jones (1991). Durbin-Watson statistics are similar to those discussed by Guenther (1994), and indicate no serious autocorrelation.

The estimated parameters from equation (3) are used to derive the expected nondiscretionary current accruals for the four-year test period, 1985 to 1988. Discretionary accruals are then estimated by subtracting the estimate of nondiscretionary accruals from actual accruals for the test period years as follows:

$$u_{it} = CACC_{it}/TA_{it-1} - d_{1i} - d_{2i}(\Delta SALES_{it} - \Delta AR_{it})/TA_{it-1} \quad (4)$$

where:

d_{1i}, d_{2i} = the parameter estimates from equation (3).

A standardized prediction error (V_{it}) is derived for each firm by dividing u_{it} by the estimated standard deviation (σ_i), where σ_i is based on the estimation period residuals from the regression of equation (3).[10]

Testing Procedures Using TAXAG

The first prediction is that more aggressive tax-planning firms have a higher probability of making negative accrual shifts in the year prior to the tax rate reductions of TRA 86 than less aggressive tax-planning firms. As noted previously, TAXAG coded one indicates more aggressive tax minimizers. The variable is coded one for the 50 percent of the sample with the highest scaled average tax-aggressiveness measure (SAVTAXAG). SAVTAXAG is measured as:

$$SAVTAXAG = \frac{\sum_{1983}^{1985} [(PTI * t) - \text{Current portion of total tax expense}] \div 3}{\text{Ending assets}_{1985}}$$

where PTI is pre-tax accounting income and t is 46 percent, the highest enacted statutory rate during the 1983–1985 time period. The bracketed portion of the numerator is Wilkie's (1992) tax subsidy (TS) variable. The variable is averaged over 1983 to 1985 (and excludes 1986) to increase the probability of identifying tax-aggressive firms that took advantage of tax shields to minimize taxes in the period immediately preceding TRA 86.[11] The TAXAG variable incorporates the notion that tax shields utilized are important in identifying tax-aggressive behavior, and are reflected in the difference between actual current tax expense and what current tax expense would be if all income were taxed at the highest statutory rate.

An indicator rather than a continuous variable is used because there are reasons to suspect that the propensity to engage in tax minimizing behavior (as measured by SAVTAXAG) is not continuous. NOL carryforward firms, for example, have no apparent incentive to shift discretionary

[10] As in Jones (1991) and Guenther (1994), the prediction error is standardized by the standard deviation of the estimation period residual error terms. The results are qualitatively equivalent when the regressions are estimated using an unstandardized prediction error.

[11] The measure is scaled by total assets to control for firm size differences.

accruals to minimize tax regardless of the amount of the carryforward. Alternatively, firms with the highest SAVTAXAG measures from 1983 through 1985 may be approaching tax-aggressiveness exhaustion. If so, the use of a continuous measure will bias against rejection of the null hypotheses. In using an indicator variable, there is no available empirical evidence regarding the appropriate cutoff. Although we initially used 50 percent because the median value provided the single most intuitive cutoff, we also estimated all regressions using SAVTAXAG cutoffs of 25 percent and 75 percent. The primary results reported are based on the 50 percent cutoff. A summary of results using these alternative specifications is contained in footnote 24.

To test the first hypothesis, a logistic regression is estimated where the dependent variable (discretionary accrual shift) is set to one for firms with a negative accrual shift in the test period, and zero otherwise. The independent variables include TAXAG and a set of control variables.

The second hypothesis is that more aggressive tax-planning firms make greater negative accrual shifts in the year preceding the TRA 86 rate reductions than other firms. The second prediction is tested with OLS regressions of discretionary current accruals on TAXAG and a set of control variables.

The third hypothesis is that firms with fiscal year-ends will make greater negative accrual shifts in the year preceding the TRA rate reduction than calendar year-end firms. To test this prediction the calendar and fiscal year-end data sets are combined into one sample. Regression equations, which include indicator variables reflecting calendar or fiscal year-end and tax aggressiveness, are then estimated.

Control of Nontax Effects

Five additional variables are included in the regressions to control for nontax effects that may be related to inter-firm differences in discretionary accruals. Additionally, the controls allow comparison of this research with Guenther (1994).

The first is a size variable (SIZE), set equal to one if firm sales are in the top 25 percent of the sample firms' sales, and zero otherwise.[12] Guenther (1994, 235), noting that prior research indicates that larger firms are sensitive to political costs and are more likely to choose income-decreasing accounting methods in order to minimize such costs, suggests that larger firms will engage in more tax-minimizing accrual shifts to take advantage of the tax rate reductions of TRA 86 than smaller firms. Theoretically, the size argument is difficult to apply in the area of tax minimization. If the motivation for large firms to engage in income-decreasing behavior is to *avoid* regulatory scrutiny, tax minimization via accrual shifting potentially serves to *heighten* IRS scrutiny. Additionally, attributing any observed income decreasing shifts to a tax effect is confounded by previous research that has found that firm size is generally associated with income decreasing accounting choices.[13] To reduce the impact of this confound, the model utilized in this study separates the effect of size and tax aggressiveness by including a control variable for size and an indicator variable for tax aggressiveness.

The second control variable is long-term debt scaled by beginning total assets (DEBTR), which proxies for closeness to technical default. Positive accounting theory predicts that firms close to technical default of bond covenants have greater incentives to choose income increasing accounting accruals than other firms. Guenther's (1994) results are consistent with this prediction.

The third control variable is the level of management ownership. Guenther (1994) includes management ownership as an explanatory variable in his test period regressions, predicting that

[12] The 25 percent cutoff was used to facilitate consistency with Guenther (1994). We also estimated the test period regressions with size operationalized as a sales-based dichotomous variable coded one for the top 10 percent of the sample and zero otherwise. These tests (not reported) provided quantitatively and qualitatively similar results to those reported. The relatively high cutoff for size (top 10 percent of sales) reflects prior literature, which indicates that only the very largest firms are subject to political cost pressures.

[13] See, for example, Watts and Zimmerman (1978), Zmijewski and Hagerman (1981), Daley and Vigeland (1983).

the higher the management ownership of the firm, the greater the likelihood that management will shift financial statement income to reduce taxes. Consistent with this prediction, Klassen (1997) finds that financial reporting costs associated with reducing taxes is generally lower for firms with high management ownership concentration. Consequently, such firms have a greater propensity to engage in transactions that minimize tax even if this results in lower book income, thus, the higher the level of management ownership, the lower the information asymmetries which must be mitigated by accrual accounting procedures. Accordingly, firms with high levels of management ownership may have greater negative accrual shifts in the year prior to TRA 86 rate reductions than will other firms.

The final two control variables relate to firms which may not be expected to respond to rate reductions contained in TRA 86 by shifting discretionary accruals across years. The fourth control variable reflects whether firms reported net operating loss (NOLs) carryforwards at the end of 1986.[14] Eighty firms in our full sample (see "Sample Selection" below) report NOL carryforwards. Guenther (1994) eliminated such firms; the current study retains the firms and includes a control variable in the cross-sectional regressions to provide evidence on the relation between discretionary accruals and NOLs.

The final control variable reflects whether firms reported payment of alternative minimum tax in 1986; the variable AMT is coded one if firms reported such payment, and zero otherwise. However, as noted in Guenther (1994), control for firms which actually reported payment of AMT in 1986 does not necessarily identify those firms which avoided payment of AMT during the test period by accelerating financial statement income from 1987 to 1986. Further, relying on self-reported AMT disclosure may bias tests of earnings management for firms subject to AMT (Manzon and Plesko 1996). Accordingly, we also rely on data reduction techniques suggested in Boynton et al. (1992) and described below to control for potential AMT-induced earnings management incentives.

Test Period Model

The empirical tests take the form of the following logit (multiple regression) model used to test the first (second and third) hypothesis:

$$V_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 DEBTR_{it} + \alpha_3 NOL_{it} + \alpha_4 AMT_{it} + \alpha_5 MGT_{it} + \alpha_6 TAXAG_{it} \quad (5)$$

where:

V_{it} = logit model (H1): one if the discretionary current accrual for firm i in period t is negative, and zero otherwise;
= OLS regression (H2 and H3): standardized discretionary current accruals;
$SIZE_{it}$ = one if firm i's sales are in the top 25 percent of all sample firm sales in period t and zero otherwise;
$DEBTR_{it}$ = the book-value of long-term debt divided by total assets for firm i at period t − 1;
NOL_{it} = one if firm i reported an NOL carryforward at the end of 1986, and zero otherwise;
AMT_{it} = one if firm i reported payment of alternative minimum tax in 1986, and zero otherwise;
MGT_{it} = percentage management ownership for firm i[15]; and
$TAXAG_{it}$ = one if firm i's scaled average tax-aggressiveness measure is in the highest 50 percent of the combined sample for 1983 through 1985, and zero otherwise.

Table 1 provides variable definitions and Compustat data item numbers for all variables.

[14] In classifying NOL firms based on existence of NOLs at the end of 1986, we are following procedures in and increasing the comparability of our results with Guenther (1994, 238). Because 1986 presumably reflects the results of earnings management, we re-estimated the primary regressions (tables 6 and 7 below) after coding NOL as one if the firm reported an NOL at the end of 1985. The results of these regressions, which are not presented, are essentially identical to those reported in this paper; the sole exception is that the coefficient on NOL is positive and insignificant in all years.

[15] This variable was obtained from the April 1988 version of Compact Disclosure.

TABLE 1
VARIABLE MNEMONICS, DEFINITIONS AND SOURCES

Variable Mnemonic	Variable Definition	Data Source or Compustat Variable Numbers
AMT	Indicator variable for firms that paid AMT in 1986. Set equal to one if firm paid AMT; otherwise, equal to zero.	NAARS
AVGTP/TE	Average of TP/TE from 1983 to 1985	$[\Sigma_{1983}^{1985}$ (TP/TE)] ÷ 3
CHGAR	Change in accounts receivable from period t − 1 to t	V2 − Lag V2
CACC	Current accruals, measured as: (change in accounts receivable plus inventory) less (change in accounts payable plus accrued expenses) from period t − 1 to t	[(V2 + V3)− (Lag V2 + Lag V3)] − [(V70 + V153) − (Lag V70 + Lag V153)]
CHGSALES	Change in sales from period t − 1 to t	V12 − Lag V12
DEBTR	Scaled long-term debt, measured as book value of long-term debt divided by beginning total assets	V9/Lag V6
MGT	Percent of outstanding stock owned by officers and directors	Compact Disclosure (April 1988)
NOL	Indicator variable for existence of net operating loss carryforward; set equal to one if firm had NOL carryforward at end of 1986; otherwise, equal to zero	NAARS
PTI	Pre-tax income, measured as income before extrordinary items and discontinued operations plus minority interest and income tax expense, minus equity earnings in unconsolidated subsidiaries	V18 + V49 + V16 − V55
SAVTAXAG	Average tax aggressiveness measured from 1983 to 1985, scaled by ending 1985 total assets. Tax aggressiveness is measured as pre-tax income multiplied by the highest statutory rate (t), minus the current tax expense.	$\frac{\{\Sigma_{1983}^{1985} [(PTI * t) - (V16 - V50)]\} \div 3}{TA_{1985}}$
SIZE	Size, measured using net sales; indicator variable is set equal to one if firm is in top 25% of combined sample firms for 1986 net sales; otherwise, equal to zero	V12
TA	Total assets	V6
TAXAG	Indicator variable equal to one if firm's SAVTAXAG measure is in the upper 50% of all tax subsidy measures for all sample firms measured over 1983 to 1985, zero otherwise	
TP/TE	Taxes paid to tax expense, measured as tax expense plus beginning of the period deferred tax credits less end of the period deferred tax credits, divided by tax expense	(V16 + Lag V74 − V74) / V16

TABLE 2
SAMPLE SELECTION

	Calendar	Fiscal	Combined
Original sample from Guenther[a]	408	104	512
Firms without complete estimation period data	100	31	131
Remaining firms without complete test period data	9	1	10
Full sample[b]	299	72	371
Firms in the lowest quartile of TP/TE ratio	(74)	(18)	(92)
Reduced sample[c]	225	54	279

[a]Guenther's (1994, 237) initial sample consisted of 487 firms (388 calendar year and 99 fiscal year firms). He supplied us with a 512 firm sample.
[b]In the full calendar year sample there are 80 NOL firms and 22 AMT firms. In the full fiscal year sample there are 18 NOL firms and 2 AMT firms.
[c]In the reduced calendar year sample there are 25 NOL firms and 9 AMT firms. In the reduced fiscal year sample there are 6 NOL firms and 1 AMT firm.

Sample Selection

The starting point for sample selection is Guenther's (1994) sample consisting of 408 calendar year-end firms and 104 fiscal year-end firms taken from the 1990 Compustat annual industrial tape.[16] Firms in the manufacturing, wholesale, retail and services (other than financial services) industries are included in the sample.[17]

The effect of additional data reduction procedures is provided in table 2. First, 100 firms without sufficient Compustat data to estimate equation (3) for years 1972 through 1984 are excluded. Nine additional firms are excluded because of incomplete test period data. The remaining 299 calendar year-end and 72 fiscal year-end firms are labeled the *full sample*. The primary results, however, are based on a further data reduction step which eliminates those firms in the full sample which are most likely to be effected by considerations related to the alternative minimum tax. Plesko and Manzon (1996) find that a firm's self-disclosure of AMT status is not necessarily a reliable indicant of the firm's actual AMT status. Accordingly, we eliminated firms in the lowest quartile of the measure of taxes paid to tax expense averaged over three years (from 1983 through 1985). This procedure, suggested in Choi et al. (1991) and supported by evidence in Boynton et al. (1992), is consistent with Guenther (1994). Table 3 provides descriptive statistics and correlation matrices for the reduced sample firms.

EMPIRICAL RESULTS

The first hypothesis predicts that aggressive tax-planning firms are more likely to make negative accruals shifts in the year preceding TRA 86 rate reductions than are other firms. Empirical

[16] Guenther (1994, 237) indicates that the initial sample consisted of 487 firms; the sample which was provided to us consists of 512 firms. The number of firms available for use in hypothesis testing is smaller in this study than in Guenther (1994), primarily because this study requires additional Compustat variables to estimate the Modified Jones Model (equation (3)) and to construct the tax aggressiveness measure. In addition to the sample provided by Guenther, we selected our own sample using the criteria noted above. The sample was essentially identical to that provided by Guenther.

[17] The financial services, utility, and insurance industries are excluded from the study because of the unique tax rules and regulatory requirements applicable to these industries.

TABLE 3
REDUCED SAMPLE DESCRIPTIVE STATISTICS AND CORRELATION MATRICES

Panel A: Reduced Sample Descriptive Statistics for Calendar (December) Year-End Firms (n = 225)

Variable[a]	Mean	Median	Std. Dev.	Minimum	Maximum
AMT	.04	0.00	.20	0.00	1.00
AVGTP/TE	1.12	0.96	0.82	.69	8.99
CACC	22.00	2.67	308.80	−2259.00	7209.00
ΔSALES	109.70	24.54	1410.68	−17391.01	14944.00
DEBTR	.17	0.15	0.14	0.00	.75
MGT	12.64	5.96	15.50	0.00	79.69
NOL	0.11	0.00	.31	0.00	1.00
TAXAG	.47	0.00	.49	0.00	1.00
SIZE	.24	0.00	.43	0.00	1.00
TA	2671.30	437.52	7511.73	3.61	74293.00
V	.64	−0.01	6.22	−29.04	54.29
Components of CACC					
ΔAR	25.51	4.75	151.09	−1919.00	1916.00
ΔINV	19.63	2.33	134.31	−783.00	1867.00
ΔAP	10.47	1.94	163.58	−1939.00	2399.00
ΔAE	12.67	1.29	266.87	−6263.00	2266.00

Panel B: Reduced Sample Descriptive Statistics for Fiscal (May, June or July) Year-End Firms (n = 54)

AMT	.02	0.00	.14	0.00	1.00
AVGTP/TE	1.00	0.99	0.26	0.79	2.31
CACC	8.91	3.22	39.39	−165.00	245.88
ΔSALES	56.82	21.42	172.85	−821.80	728.78
DEBTR	.14	0.09	.14	0.00	.50
MGT	17.04	7.74	20.69	0.00	99.00
NOL	.11	0.00	0.32	0.00	1.00
TAXAG	.62	1.00	.48	0.00	1.00
SIZE	.20	0.00	.40	0.00	1.00
TA	596.87	242.83	898.38	4.80	5074.48
V	.33	0.27	5.34	−27.36	22.45
Components of CACC					
ΔAR	8.03	3.57	32.77	−207.30	166.91
ΔINV	8.55	2.16	39.84	−198.10	191.90
ΔAP	5.04	1.55	24.32	−161.90	131.50
ΔAE	2.63	0.80	16.73	−78.50	92.60

(Continued on next page)

evidence related to the prediction for calendar (fiscal) year-end firms is contained in table 4 (table 5).[18] The logit results for calendar year-end firms contain a significantly positive coefficient on

[18] In tables 4 through 7, we present data for two years prior to the tax rate change and the year(s) of the tax rate change for both calendar and fiscal year-end firms. This results in four years of data for calendar and three years of data for fiscal year-end firms. The objective of our presentation is to provide data for (1) the year before there is a motivation to manage earnings based on a tax rate change (1985 for calendar year-end firms and FY 1986 for fiscal year-end firms); (2) the year(s) that appear to have a tax motivation to manage earnings based on a tax rate change (1986 and 1987 for calendar year-end firms and FY 1987 for fiscal year-end firms); and (3) the year after there is a tax motivation to manage earnings based on a tax rate change (1988 for calendar year-end firms and FY 1988 for fiscal year-end firms). This presentation is consistent with Guenther (1994).

TABLE 3 (Continued)

Panel C: Pearson Correlation Matrix for Reduced Sample Calendar (December) Year-End Firms (n = 225)

	AVGTP/TE	AMT	CACC	CHGSLS	CHGAR	DEBTR	MGT	NOL	TAXAG	SIZE	TA
AVGTP/TE	1.00										
AMT	−.04	1.00									
CACC	.01	−.01	1.00								
CHGSLS	.04	−.02	−.07	1.00							
CHGAR	.03	−.02	.26	.68	1.00						
DEBTR	.15	.07	−.02	−.05	−.03	1.00					
MGT	.02	−.06	−.04	−.05	−.09	−.06	1.00				
NOL	.22	.36	−.02	−.02	−.01	.22	−.07	1.00			
TAXAG	−.02	−.09	−.01	.07	.07	−.02	−.09	−.18	1.00		
SIZE	.10	.09	.13	.09	.18	.15	−.35	.10	.01	1.00	
TA	−.02	−.01	.14	.08	.14	−.01	−.20	−.02	−.00	.67	1.00

Panel D: Pearson Correlation Matrix for Reduced Sample Fiscal (May, June or July) Year-End Firms (n = 54)

AVGTP/TE	1.00										
AMT	−.00	1.00									
CACC	−.14	−.05	1.00								
CHGSLS	−.17	−.04	.36	1.00							
CHGAR	−.13	−.04	.70	.60	1.00						
DEBTR	.11	.22	−.00	−.05	.03	1.00					
MGT	−.20	−.08	−.06	.07	.11	−.15	1.00				
NOL	.03	.38	−.06	−.08	−.04	.28	−.09	1.00			
TAXAG	−.14	−.17	.12	.20	.12	.00	−.09	−.37	1.00		
SIZE	.12	−.07	.14	.45	.22	.00	−.10	−.18	.15	1.00	
TA	.08	−.08	.21	.27	.31	.11	−.03	.14	.22	.73	1.00

[a]The following variables are presented here before deflation: CACC, ΔSALES, ΔAR, ΔINV, ΔAP, ΔAE and TA. These variables are averaged over 1985 through 1988 (calendar year-end firms) and 1986 through 1988 (fiscal year-end firms). Other variables are measured as described in the text.

TAXAG in 1986, consistent with the first prediction. TAXAG is not significant in any other year in the table. For fiscal year-end firms, TAXAG is insignificant in 1987.

None of the control variables are significant at the 5 percent level in the year prior to the rate change. The MGT coefficient is significant in both tables two years prior to the rate change; this indicates that firms with relatively higher levels of management ownership were more likely to make negative discretionary accrual shifts two years in advance of the rate reductions implemented in TRA 86. This result is subject to multiple interpretations (which are not examined in this paper), including anticipation of TRA 86 rate reductions by managers of such firms and reversals of positive shifts in prior years. In addition, NOL is significantly negative in 1987 for calendar year-end firms (table 4). Because NOL is measured at the end of 1986, this result suggests that firms which had NOLs carried forward into 1987 were less likely to make further negative discretionary accrual shifts in 1987 than other firms were.

TABLE 4
LOGIT RESULTS FOR CALENDAR YEAR-END FIRMS
(n = 225)

Model[a]: $V_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 DEBTR_{it} + \alpha_3 NOL_{it} + \alpha_4 AMT_{it} + \alpha_5 MGT_{it} + \alpha_6 TAXAG_{it}$

	Predicted Sign	1985 (46% rate)	1986 (46% rate)	1987 (40% rate)	1988 (34% rate)
Intercept	(?)	0.026	−0.047	0.112	−0.015
		(0.022)[b]	(0.070)	(0.412)	(0.008)
		[0.880][c]	[0.790]	[0.520]	[0.927]
SIZE	(+)	−0.025	−0.578	0.031	−0.297
		(0.007)	(3.301)	(0.011)	(0.984)
		[0.931]	[0.069]	[0.915]	[0.321]
DEBTR	(−)	−0.887	−0.267	0.381	−0.111
		(1.956)	(0.176)	(0.361)	(0.031)
		[0.161]	[0.674]	[0.547]	[0.859]
NOL	(?)	0.362	0.243	−0.604	0.202
		(1.416)	(0.648)	(3.908)	(0.471)
		[0.233]	[0.420]	[0.048]	[0.492]
AMT	(?)	−0.951	−0.800	0.022	0.119
		(3.137)	(2.363)	(0.002)	(0.065)
		[0.068]	[0.124]	[0.962]	[0.797]
MGT	(+)	0.042	−0.007	0.002	−0.001
		(4.044)	(1.476)	(0.204)	(0.067)
		[0.044]	[0.224]	[0.650]	[0.795]
TAXAG	(+)	−0.023	0.479	0.079	0.015
		(0.014)	(5.365)	(0.127)	(0.004)
		[0.905]	[0.020]	[0.720]	[0.948]

[a]The variables are defined as follows: V_{it} is coded as one if discretionary current accruals for firm i in period t are negative, and zero otherwise; $SIZE_{it}$ is one if firm i's sales are in the top 25 percent of all sample firm sales in 1986, and zero otherwise; $DEBTR_{it}$ is firm i's long-term debt at the end of period t divided by beginning total assets; NOL_{it} is one if firm i had NOL carryforward at end of 1986, and zero otherwise; AMT_{it} is one if firm i paid AMT in 1986, and zero otherwise; MGT_{it} is the percentage of management ownership; and $TAXAG_{it}$ is one if firm i's scaled average tax subsidy measure for 1983 through 1985 is in the upper 50 percent of tax subsidy measures for all sample firms measured over 1983 to 1985, and zero otherwise.
[b]Chi-squared statistics in parentheses.
[c]Two-tailed p-values in brackets.

Reduced sample results related to the second hypothesis are contained in tables 6 and 7, which provide results of OLS estimation for calendar and fiscal year-end firms, respectively. Hypothesis two predicts that tax-aggressiveness and the magnitude of discretionary current accrual shifts in the period preceding TRA 86 are inversely related. In tables 6 and 7, the coefficients on the TAXAG measure are significantly negative at the 5 percent level (one-tailed) for both calendar and fiscal year-end firms in the year prior to the initial rate cut, and insignificant in all other years. This evidence is consistent with H2. These results are consistent with aggressive tax-minimizing firms

TABLE 5
LOGIT RESULTS FOR FISCAL (MAY, JUNE, OR JULY) YEAR-END FIRMS
(n = 54)

Model[a]: $V_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 DEBTR_{it} + \alpha_3 NOL_{it} + \alpha_4 AMT_{it} + \alpha_5 MGT_{it} + \alpha_6 TAXAG_{it}$

	Predicted Sign	FY 1986 (46% rate)	FY 1987 (46% rate)	FY 1988 (34% rate)
Intercept	(?)	−0.073	−0.386	0.347
		(0.027)[b]	(0.827)	(0.724)
		[0.868][c]	[0.363]	[0.394]
SIZE	(+)	−0.148	0.632	−1.000
		(0.060)	(1.165)	(2.361)
		[0.805]	[0.280]	[0.124]
DEBTR	(−)	0.300	0.806	1.044
		(0.037)	(0.289)	(0.569)
		[0.845]	[0.590]	[0.450]
NOL	(?)	−7.129	−6.612	−0.245
		(0.000)	(0.000)	(0.136)
		[0.999]	[0.999]	[0.711]
AMT	(?)	13.682	13.405	5.906
		(0.000)	(0.000)	(0.000)
		[0.999]	[0.999]	[0.999]
MGT	(+)	0.024	0.002	0.003
		(4.298)	(0.062)	(0.114)
		[0.038]	[0.802]	[0.734]
TAXAG	(+)	−0.243	0.012	−0.526
		(0.307)	(0.001)	(1.679)
		[0.579]	[0.976]	[0.195]

[a]The variables are defined in the notes to table 4.
[b]Chi-squared statistics in parentheses.
[c]Two-tailed p-values in brackets.

shifting accruals in the year prior to the initial rate change, and the pending rate change providing greater than normal incentives to shift accruals for such firms.[19]

Tables 6 and 7 also provide evidence related to the size, leverage, management ownership, AMT and NOL control variables. For calendar year-end firms, none of the control variables are

[19] Alternatively, we considered whether the significant coefficient on TAXAG was the result of increased restructuring activitiy in 1986. To directly address whether restructurings were responsible for the results, we identified all sample firms that either explicitly reported restructuring charges or reported other special charges typically associated with restructuring, such as asset write-downs, plant closings, etc. Two considerations lead us to believe these charges are not driving the results. First, the mean and median values of accrued expenses for these restructuring firms are similar to the values for nonrestructuring firms. Second, all models were re-estimated eliminating restructuring firms. The results for this restricted sample were stronger (more negative and greater significance) for the TAXAG coefficient than those reported in this paper. These stronger results can be explained as follows. Restructuring charges are generally deductible for tax purposes when paid, not when accrued. Hence, a large negative discretionary accrual shift in 1986 that was *not* tax motivated would bias our models against finding results, unless there was also a high positive correlation between restructuring firms and tax aggressive firms. We were not able to find any such correlation.

TABLE 6
OLS RESULTS FOR CALENDAR YEAR-END FIRMS
(n = 225)

Model[a]: $V_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 DEBTR_{it} + \alpha_3 NOL_{it} + \alpha_4 AMT_{it} + \alpha_5 MGT_{it} + \alpha_6 TAXAG_{it}$

	Predicted Sign	1985 (46% rate)	1986 (46% rate)	1987 (40% rate)	1988 (34% rate)
INTERCEPT	(?)	−0.611	2.178	1.004	0.169
		(−0.796)[b]	(1.874)	(1.206)	(0.220)
		[0.427][c]	[0.062]	[0.229]	[0.826]
SIZE	(−)	0.234	1.198	−0.130	2.216
		(0.191)	(0.646)	(−0.097)	(1.767)
		[0.848]	[0.519]	[0.922]	[0.078]
DEBTR	(+)	6.765	4.648	−6.416	0.351
		(2.628)	(1.186)	(−2.259)	(0.133)
		[0.009]	[0.236]	[0.024]	[0.894]
NOL	(?)	−0.925	−2.565	3.370	0.432
		(−0.748)	(−1.370)	(2.494)	(0.346)
		[0.455]	[0.172]	[0.013]	[0.729]
AMT	(?)	1.447	−0.145	−0.915	−0.991
		(0.762)	(−0.050)	(−0.437)	(−0.507)
		[0.446]	[0.959]	[0.662]	[0.612]
MGT	(−)	−0.042	0.039	−0.046	0.029
		(−1.854)	(1.121)	(−1.827)	(1.236)
		[0.065]	[0.263]	[0.069]	[0.217]
TAXAG	(−)	0.770	−2.967	0.033	−0.264
		(1.083)	(−2.736)	(0.042)	(−0.362)
		[0.280]	[0.006]	[0.966]	[0.717]
R^2		0.058	0.050	0.057	0.019
F-statistic		(2.267)	(1.920)	(2.225)	(0.718)
p-value		[0.038]	[0.078]	[0.041]	[0.635]

[a]The variables are defined as follows: V_{it} is the standardized empirical measure of earnings management for firm i in period t, calculated as the current accruals in period t less the expected current accruals in period t; all other variables are defined in the notes to table 4.
[b]t-statistics in parentheses.
[c]Two-tailed p-values in brackets.

significant at the 5 percent level in the year prior to the rate change.[20] The AMT and NOL coefficients for fiscal year-end firms appear significant, however, these results are obtained from only six NOL firms and one AMT firm (see table 2). Therefore, we do not consider them reliable (table 3, panel D, indicates a high degree of correlation between these variables for fiscal year-end firms.) The coefficient on DEBTR is significantly positive in 1985, positive but insignificant in

[20] One possible explanation for the reported insignificance of SIZE would be a high positive correlation between TAXAG and firm size. To investigate this issue, correlations of SIZE and TAXAG were examined for the test-period years. The correlations were .01 for calendar year-end firms and .15 for fiscal year-end firms (see panels C and D of table 3). Based on these results, it does not appear that TAXAG is proxying for size in our regressions.

TABLE 7
OLS RESULTS FOR FISCAL (MAY, JUNE, OR JULY) YEAR-END FIRMS
(n = 54)

Model[a]: $V_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 DEBTR_{it} + \alpha_3 NOL_{it} + \alpha_4 AMT_{it} + \alpha_5 MGT_{it} + \alpha_6 TAXAG_{it}$

	Predicted Sign	FY 1986 (46% rate)	FY 1987 (46% rate)	FY 1988 (34% rate)
INTERCEPT	(?)	−0.640	3.979	−0.980
		(−0.501)[b]	(2.413)	(−0.556)
		[0.618][c]	[0.019]	[0.580]
SIZE	(−)	1.570	−0.255	2.391
		(0.939)	(−0.118)	(1.037)
		[0.352]	[0.906]	[0.305]
DEBTR	(+)	−2.768	−1.929	−1.542
		(−0.698)	(−0.377)	(−0.282)
		[0.488]	[0.707]	[0.779]
NOL	(?)	5.005	5.254	−6.301
		(2.563)	(2.085)	(−2.340)
		[0.013]	[0.042]	[0.023]
AMT	(?)	−11.913	−19.471	2.168
		(−2.883)	(−3.652)	(0.381)
		[0.005]	[0.001]	[0.705]
MGT	(−)	−0.036	−0.045	−0.006
		(−1.472)	(−1.388)	(−0.182)
		[0.147]	[0.171]	[0.856]
TAXAG	(−)	1.296	−2.843	1.492
		(1.028)	(−1.747)	(0.858)
		[0.309]	[0.087]	[0.395]
R^2		0.241	0.310	0.218
F-statistic		(2.499)	(3.519)	(2.185)
p-value		[0.035]	[0.006]	[0.061]

[a]The variables are defined as follows: V_{it} is the standardized empirical measure of earnings management for firm i in period t, calculated as the current accruals in period t less the expected current accruals in period t; all other variables are defined in the notes to table 4.
[b]t-statistics in parentheses.
[c]Two-tailed p-values in brackets.

1986, and significantly negative in 1987 for calendar year-end firms. The 1985 result is consistent with our expectation that highly levered firms will make income increasing discretionary shifts in years prior to tax rate decreases, and the 1986 result, while not significant at conventional levels, is consistent with our expectation. The significant negative coefficient in 1987 appears to contradict both the stated expectation and prior empirical findings. To the extent, however, that the 1987 results represent a reversal of the accruals recorded in 1985 and 1986, the 1987 results are consistent with firm behavior observed in those years. If highly levered firms made significant positive accrual shifts in both 1985 and 1986, these shifts would eventually have to reverse, and the negative coefficient on DEBTR in 1987 may indicate such a reversal. The coefficient on NOL is significantly positive in 1987 for calendar year-end firms. These results are consistent with results shown in table 4, which were discussed previously. None of the other coefficients for either the calendar or fiscal year-end samples are significant in any year at the 5 percent level.

Results provided in tables 6 and 7 indicate that the overall explanatory power of the models are qualitatively similar to Guenther's (1994).[21] The explanatory power of the calendar year-end models is modest, with R^2 values ranging from .019 to .0587. Higher values are obtained for fiscal year-end firms; these R^2 values range from .218 to .310. These values are somewhat higher than Guenther's, which ranged from .003 to .170. Unlike Guenther (1994), the size variable was not significant.[22]

The OLS regressions of tables 6 and 7 were also estimated using the full sample of calendar and fiscal year-end firms. As discussed above, the full sample is potentially subject to confounding effects related to the AMT. The results (not reported) of these regressions, in regard to tax aggressiveness and the second prediction, are qualitatively similar to those contained in tables 6 and 7, except that TAXAG is only marginally significant for the fiscal year-end firms when low taxes paid to tax expense firms are included in the sample (one-tailed, $p = .081$).

The third prediction is that fiscal year-end firms will make greater negative accrual shifts than calendar year-end firms will in the year preceding the tax rate reduction. To test the prediction, both fiscal and calendar year-end firms are pooled and a new indicator variable FCIND is added to the model of equation (5). FCIND is coded one if a firm is a fiscal year-end firm, and zero otherwise. If fiscal year-end firms do in fact make greater negative accrual shifts than calendar year-end firms, the coefficient on the FCIND variable should be negative.

Results of estimating the regression for the reduced sample are contained in table 8. The results indicate that FCIND is significantly negative in 1986 (fiscal year 1987 for fiscal year-end firms), consistent with the third hypothesis.[23] Additionally, TAXAG remains significant at the 5 percent level in this combined sample.[24]

Reversals in Accruals

Our hypotheses suggest that firms have an incentive to choose income-decreasing accruals in the year prior to the TRA 86 tax rate change in order to take advantage of lower tax rates in the post-TRA time period. The evidence presented in tables 4 through 8 support our predictions. One

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[21] Earlier versions of this paper addressed the relative effectiveness of proxying discretionary accruals using DeChow et al.'s (1995) modified Jones model of equation (3) relative to the original Jones model used in Guenther (1994). When models are re-estimated using the Jones model to estimate discretionary current accruals, results are quantitatively similar to those provided in tables 6 and 7.

[22] To minimize the effect of large increases or decreases in current accruals relative to total assets at time period $t - 1$, equation (5) was re-estimated using the average of beginning and end of year total assets to adjust for heteroskedasticity (based on White's test there is no significant heteroscedasticity in the primary tests reported here). The empirical results for the second and third predictions are qualitatively and quantitatively similar for both the calendar and fiscal year-end samples. Additionally, we utilized SAS procedures to check for the presence of influential observations (e.g., DFFITS) and none were detected.

[23] The model of table 8 includes FCIND as an intercept shift term only. We also ran the model including an additional variable TAXAG*FCIND designed to capture the extent to which the two variables interact. A significant negative coefficient on this variable would indicate that the presence of tax-aggressive, fiscal year-end firms explains incremental variation in standardized discretionary accruals beyond that explained by the TAXAG and FCIND variables. Results of the model estimated using the interaction variable are essentially unchanged from table 8; the interaction variable was not significant.

[24] Although we regard use of an indicator as most appropriate, we also estimated all regressions using SAVTAXAG as a continuous measure. The results of these OLS regressions indicate that the coefficient on SAVTAXAG (the continuous measure) is significantly negative for the calendar year-end sample and negative but not significant for both the fiscal and combined samples. Additionally, we estimated results using SAVTAXAG cutoffs of 25 percent and 75 percent. For the 25 percent cutoff, the coefficient on TAXAG is insignificant in all years for all samples (calendar, fiscal and combined) in both the OLS and logistic regressions. For the 75 percent cutoff, the coefficient on TAXAG in the OLS regressions for the calendar and combined samples is negative and significant (but not at the same level as the 50 percent cutoff), but it is not significant for the fiscal year-end sample. In the corresponding logistic regression, the coefficient is insignificant for both the calendar and fiscal year-end samples.

TABLE 8
OLS RESULTS FOR COMBINED SAMPLE FIRMS
(n = 279)

Model[a]: $V_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 DEBTR_{it} + \alpha_3 NOL_{it} + \alpha_4 AMT_{it} + \alpha_5 MGT_{it} + \alpha_6 TAXAG_{it} + \alpha_7 FCIND_{it}$

	Predicted Sign	1985 (FY 1986) (46% rate)	1986 (FY 1987) (40% or 34%)	1987 (FY 1988)[b] (34% rate)
Intercept	(?)	−0.151	2.023	.381
		(−0.211)[c]	(2.001)	(.514)
		[0.833][d]	[0.046]	[0.608]
SIZE	(−)	0.579	1.184	0.715
		(0.494)	(0.707)	(0.572)
		[0.622]	[0.480]	[0.568]
DEBTR	(+)	4.378	3.518	−5.638
		(1.861)	(1.045)	(−2.249)
		[0.638]	[0.297]	[0.025]
NOL	(?)	.436	−3.496	3.209
		(0.384)	(−2.164)	(2.687)
		[0.701]	[0.031]	[0.008]
AMT	(?)	−.814	0.289	−1.373
		(−.446)	(.111)	(−0.705)
		[0.656]	[0.912]	[0.481]
MGT	(−)	−0.038	0.029	−0.016
		(−1.930)	(1.026)	(−.781)
		[0.055]	[0.306]	[0.435]
TAXAG	(−)	0.328	−1.776	0.322
		(0.503)	(−1.903)	(0.466)
		[0.615]	[0.058]	[0.641]
FCIND	(−)	0.976	−2.199	0.570
		(1.244)	(−1.958)	(.681)
		[0.215]	[0.051]	[0.496]
R^2		0.037	0.048	0.041
F-statistic		1.473	1.963	1.690
p-value		[0.177]	[0.060]	[0.111]

[a]The variables are defined as follows: V_{it} is the standardized empirical measure of earnings management for firm i in period t, calculated as current accruals in period t less expected current accruals in period t; $FCIND_{it}$ is an indicator variable coded one if the firm has a fiscal year-end and zero otherwise; all other variables are defined in the notes to table 4.

[b]Fiscal year-ends and tax years do not coincide. For example, fiscal year-end June 1988 is considered tax year 1987. Thus, the title columns include descriptions for both the tax year (1985, 1986, and 1987), which is the same for calendar year-end firms, and the fiscal year (FY 1986, FY 1987, and FY 1988), for May, June, and July year-end firms.

[c]t-statistics in parentheses.

[d]Two-tailed p-values in brackets.

of the consequences of deferring revenue or accelerating expense is that the manipulated item will generally reverse in a subsequent period. Thus, assuming the TAXAG variable captures only the tax-aggressiveness of a firm with respect to current accruals, we would expect to see a positive coefficient on the TAXAG variable in the year subsequent to the tax rate change (the year following the accrual shift).

For fiscal year-end firms, the year subsequent to the rate change is fiscal year 1988. Empirical results of OLS estimation for 1988 are reported in table 7. The coefficient on the TAXAG variable is positive but insignificant.

Calendar year firms represent a more complex problem. Because the timing of the rate reduction in TRA 86 was a function of fiscal year-end, calendar year-end firms faced a 6 percent rate reduction in both 1986 and 1987. The empirical results for the calendar year-end reduced sample are reported in table 6. In 1987, we expected an insignificant coefficient on the TAXAG variable based on a reversal of the 1986 accrual shift and a further shifting of accruals in 1987 in response to the 6 percent rate reduction that year. As expected, the TAXAG coefficient is insignificant in 1987 for both calendar year-end samples. In 1988, however, we expected a positive coefficient on the TAXAG variable representing the reversal of the managed accruals in 1987. The results, however, do not support our expectation: the TAXAG coefficient is insignificant in 1988.[25]

CONCLUSIONS

This paper re-examines the issue of whether firms shifted financial reporting accruals in the year prior to implementation of the lower tax rates contained in TRA 86. The paper incorporates in the tax minimization model an explicit tax subsidy measure designed to proxy firm-level tax aggressiveness. Empirically, refinements were made in the dependent measure, first by modifying the model to measure the nondiscretionary component of current accruals, and second by limiting the measure of current accruals to those tax-related items over which managers may have discretion.

The results are consistent with an association between tax aggressiveness and income shifting in the period prior to implementing the lower tax rates of TRA 86. Additionally, after including the tax-aggressiveness variable, there is a significantly positive relation between the magnitude of the rate change and the magnitude of negative discretionary accruals in the year prior to the rate change. After tax aggressiveness is incorporated, firm size is not significant; suggesting that results of earlier studies may have been subject to bias resulting from omitted variables.

The results reported are subject to two important limitations. The first relates to the method used to estimate discretionary current accruals. Although this paper refined the measurement of discretionary current accruals, there was little incremental improvement apparent in overall explanatory power. Accordingly, the results may be confounded to the extent that there is still significant noise remaining in the proxy for discretionary accruals. A detailed discussion regarding limitations of the estimation model may be found in Dechow et al. (1995). The second limitation relates to the test period model. As noted previously, there have been several factors found to be related to earnings management. The test period model does not include all of those factors (an example is bonus plans). Accordingly, to the extent that there may be omitted variable bias, the results may be confounded. In the area of earnings management, generally, the power of the models developed to date has resulted in low power tests for the detection of discretionary shifts in accruals (regardless of the stimuli). An important extension of any earnings management study would be the development of a better proxy for the discretionary shift in accruals. Until such development occurs, studies in this area will be subject to the limitations noted above.

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[25] Because the coefficients used to calculate the dependent variable were estimated over 1972 to 1984, it is possible that the dependent variable is subject to more measurement error in 1988 than in earlier years.

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