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BACKGROUND PAPER #11

Has Taxable Income Overtaken Financial Reporting Income?

October 1994

By B. Anthony Billings
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Executive Summary

This paper investigates how the Tax Reform Act of 1986 (TRA86) may have altered the relationship between taxable income and financial reporting income over the last two decades. The paper examines whether a significant increase in the ratio of taxable income to financial reporting income in the post-TRA86 period occurred and tests whether the ratio of taxable income to financial reporting income is an increasing function of the firm’s alternative minimum tax (AMT) exposure.

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Two measures of taxable income are developed from a sample of U.S. manufacturing firms over the 1981-92 period. The table above shows that the ratio of taxable income to financial reporting income increased for both measures of taxable income in the post-TRA86 period. Remarkably, taxable income exceeded financial reporting income in 1988, and both ratios of taxable income to financial reporting income show an increasing trend until 1992.

Contrary to expectations, the AMT position of the firm does not appear to explain the increase in the ratio of taxable income to reporting income. One implica-
Has Taxable Income Overtaken Financial Reporting Income?

In general, corporations have historically reported lower taxable income than financial reporting income due largely to the accelerated timing of various deductions in the definition of taxable income, most notably depreciation. In recent years many corporations have seen their taxable income surpass their financial reporting income. Such a trend can be attributed to either changes in the definition of income by the Financial Accounting Standards Board (FASB) or to changes in the definition of taxable income in the Internal Revenue Code. Available data on corporate tax receipts show a significant increase in both corporate tax receipts and effective tax burden in the post-Tax Reform Act of 1986 (TRA86) period [Tax Foundation 1991].

Some researchers have argued that the revisions in the corporate alternative minimum tax (AMT) under TRA86 may have led corporations to choose accounting practices that lower the firms’s financial reporting income relative to taxable income [Guenther 1994; Dhaliwal and Wang 1992; Boynton et al. 1992]. The AMT provisions linked financial reporting income and taxable income in a new way so that firms that have AMT exposure may have an incentive to employ certain accounting practices (earnings management) to reduce their potential AMT liability.

This study investigates the role of TRA86 in altering the relationship between taxable income and financial reporting income. Specifically, this study seeks to ascertain whether taxable income increased as a proportion of financial reporting income in the post-TRA86 period for a sample of U.S. corporations and to explore the role of the AMT in the co-movement of taxable income and financial reporting income for these corporations.

Answers to these questions provide valuable information to tax policymakers regarding the economic consequences of the tax law changes made in TRA86, including the AMT. In particular, the results may indicate whether the corporate income tax base broadening of TRA86 may have gone too far in the sense of exceeding a reasonable tax base under a net income tax. In addition, the study’s results shed light on whether corporate management responded to the tax changes by altering their financial reporting policies with respect to earnings to minimize the effect of the AMT. While the study does not directly address whether the effective tax rate of corporate taxpayers increased in the post-TRA86 period, it does suggest the likely net effect of the TRA86 tax law changes on corporate taxpayers.

The remainder of the paper is organized as follows: (1) changes in the definition of income, (2) prior research on earnings management and on the influence of the book-income adjustment (BIA) in the AMT on financial reporting practices, (3) research questions, (4) research design, (5) results, (6) limitations, and (7) conclusions.

Changes in the Definition of Income

The relationship between taxable income and financial reporting income can change from a change in either the definition of the tax base (taxable income) or the definition of financial reporting income. Under Generally Accepted Accounting Principles (GAAP), financial reporting practices allow much
discretion in the reporting of income and the accrual of expenditures. Tax accounting rules, on the other hand, are based on a more well-defined set of rules and allow less discretion as to when income is reported or when expenditures are deducted.

Changes in the Definition of Taxable Income

TRA86 made sweeping changes to the tax provisions affecting the definition of taxable income of corporate taxpayers. Some of the changes in the tax base include: (1) revision of the alternative minimum tax; (2) limits on the use of installment sales reporting; (3) limits on deductible travel and entertainment expenses; (4) limits on the use of the completed contract method of reporting for long-term contracts; (5) limits on the use of the reserve method for bad debts; and (6) lengthening of the class lives for depreciable business assets. Each of these changes affected particular taxpayers or groups of taxpayers. These changes and two important changes in financial reporting practices are discussed in greater detail in Appendix A.

Prior Research

Earnings Management

Prior studies have documented evidence of businesses making discretionary changes in the timing of the financial reporting of income and expense (earnings management) and have attributed these changes to a number of causes [Healy 1985; McNichols and Wilson 1988]. Some research indicates that management establishes earnings reporting policies to smooth income or to maximize bonus payments under applicable management compensation packages [Dye 1988; Trueman and Titman 1988]. Related studies have examined the role of the book-income adjustment (BIA) under the AMT and changes in the statutory tax rate on earnings and have found apparent earnings management under these influences [Guenther 1994; Boynton et al. 1992; Dhaliwal and Wang 1992; Gramlich 1991; Manzon 1992].

In a recent study, Guenther [1994] sought to ascertain whether earnings reported for a sample of U.S. manufacturing firms were managed in response to the reduction in the statutory tax rate applicable to corporate taxpayers under TRA86. According to Guenther, the reduction in the statutory tax rate provided significant economic incentives for corporate management to defer income. The author's results confirm prior findings by Scholes [1992] of earnings management in response to the rate reduction under TRA86.

Unlike some prior work [Healy 1985], the author assumed that managers of all firms with varying levels of profitability have incentives to increase or decrease income based on target levels of reported income. Similar studies [Healy 1985; Stevenson 1987] had, by and large, linked the motivation for earnings management with income-smoothing and the maximization of management bonus payments that are tied to reported income. The sampled firms were grouped into deciles based on earnings-to-total-assets and return-on-assets. The authors tested whether firms employ income decreasing practices when earnings were high and income increasing practices when earnings were low. The author questioned earlier findings by Healy [1985] on earnings management and argued that Healy's findings may be an artifact of his research design (primarily the classification of firms).

DeAngelo [1988] extended prior work on earnings management by using
the provision for bad debt as a proxy for accounting discretion. Some percentage of the credit that taxpayers such as banks and retail institutions extend to customers eventually becomes uncollectible. Taxpayers are allowed to allocate a portion of financial reporting income to cover the debt that becomes uncollectible.

Often, taxpayers establish reserve accounts based on current levels of outstanding credit to reflect the amount of credit that is expected to become uncollectible. Proper maintenance of such reserve accounts is regarded as prudent financial management. The amount of the annual addition to or subtraction from a company's bad debt reserve may, in some instances, be subject to the discretion of the company's management.

Like DeAngelo, McNichols and Wilson [1988] used the rate at which reserves are accrued for bad debt to examine the earnings management hypothesis. The annual provision for bad debt was found to be a significant discretionary tool that management can use to raise or lower reported earnings. McNichols and Wilson's findings are consistent with DeAngelo's findings that firms appear to lower the rate at which they accrue reserves for bad debt at lower levels of income.

Alternative Minimum Tax

Dhaliwal and Wang [1992] specifically limited their focus to whether firms are likely to manage earnings to reduce the effect of the BIA under the AMT. The book income adjustment represented an attempt to assure that a business' income reported to its shareholders did not exceed by too great an amount its alternative minimum taxable income. Thus, the starting point for the computation of the book income preference is the net income disclosed on the taxpayer's applicable financial statement. Unlike McNichols and Wilson and DeAngelo, the authors considered the effects of the BIA under the AMT on financial reporting practices for both permanent and timing differences between financial reporting income and taxable income. The sampled firms were grouped based on their level of AMT exposure. The authors reported that firms that are likely to be subject to the BIA under the AMT tend to shift the timing of financially reported income and expense across years to reduce the effect of the AMT. Such a practice reduces reported financial income relative to taxable income in the current year.

Boynton et al. [1992] tested whether firms that are subject to the AMT managed reported financial earnings to reduce the effect of the AMT. Using data from annual financial statements for 1986-87, the authors reported that firms with significant AMT exposure appeared to employ practices which lowered reported income to avoid the tax. In addition, firms with significant AMT exposure that did not employ such financial practices during this period appear to have used net operating losses and foreign tax credits to avoid the tax. Earnings management appeared to have increased as the asset base of the firm decreased, but larger firms did not appear to be more likely to try to avoid the AMT than smaller firms.

The current study attempts to provide a richer understanding of the factors that account for the co-movement in taxable income and financial reporting income. The study also sheds light on the role of the AMT in earnings management in the post-TRA86 period by developing several proxies for the AMT position of the firm as alternatives to proxies for the BIA. The need for a different proxy for the AMT is
due to the replacement of the BIA by the adjusted current earnings (ACE) adjustment for taxable years beginning after December 31, 1989. Also, the BIA may not be the major item that determines whether or not a firm pays the AMT rather than the regular tax.

Research Questions

Four questions are advanced to assess the effects of TRA86 changes on the relationship between taxable income and financial reporting income. These questions are based primarily on institutional changes in the definition of taxable and financial income and on the interaction between taxable income and financial reporting under the AMT formula. The following research questions are tested:

- **Q₁**: Did taxable income increase in the post-TRA86 period as a proportion of financial reporting income?
- **Q₂**: Did taxable income increase as a proportion of financial reporting income as post-TRA86 AMT exposure increased?
- **Q₃**: Did the ratio of taxable income to financial reporting income decline after the introduction of the ACE adjustment?
- **Q₄**: Is the ratio of taxable income to financial reporting income an increasing function of the firm's state of tax-exhaustion.

**Q₁** tests whether the ratio of taxable income to financial reporting income increased in the post-TRA86 period. The hypothesis is that TRA86 widened the tax base relative to financial reporting income. If the tax base is shown to have increased relative to financial reported income, this may not be due entirely to changes in the tax base because other economic or regulatory phenomena may have changed the amount of financial reporting income.

**Q₄** tests whether higher levels of AMT exposure in the post-TRA86 period produced lower ratios of taxable income to financial reporting income. The expectation is that firms that are subject to the AMT seek to lower financial reporting earnings to reduce the effect of the book-income adjustment (BIA) under the AMT. Boynton et al. [1992] report that firms that are likely to be subject to the AMT appear to employ income decreasing practices to reduce the effect of the AMT.

**Q₃** tests whether the ratio of taxable income to financial reporting income was influenced by the replacement of the BIA with the adjusted current earnings (ACE) adjustment, given the interactive influence of the AMT and the ACE. Prior research tested the importance of the BIA and the AMT on reporting practices and reported that firms appeared to shift the recognition of income across years and otherwise employ income decreasing practices to reduce the effect of the AMT. No study to date has specifically considered the ACE adjustment. Results from **Q₃** may shed light on taxpayers' response to the ACE adjustment given that ACE is not based on financial reporting earnings, whereas the BIA was based on financial reporting earnings.

**Q₄** tests how the firm's state of tax-exhaustion affects the ratio of taxable income to financial reporting income. The expectation is that the closer the firm is to tax exhaustion, the less likely it is to manipulate earnings as a basis for avoiding the AMT.

Research Design

Data from a sample of U.S. industrial firms over the years 1981 - 1992 are used to model changes in the relationship between financial reporting income and taxable income using a pooled cross-
sectional time-series design. The sample consists of industrial firms on COMPUSTAT computer files. The initial sample consisted of 4,274 firms. Those without complete data for pre-tax income over the sample period were eliminated, leaving 448 firms. Of the remaining firms, 188 were eliminated in the definition of taxable income because of incomplete information on one or more of the data items. Twenty-two of the remaining 260 firms also had missing data for some years for net operating loss carried forward or for depreciation and were dropped from the sample. A final sample of 238 firms spanning the 1981-92 period was used to develop multiple regression models using the AUTOREG procedure in the statistical package SAS.

The explanatory variables include: (1) TRA86, (2) the firm's post-TRA86 AMT position, (3) the ACE adjustment, (4) the firm's state of tax exhaustion, and (5) the average of the ratio of taxable income to financial reporting income for the industry. The dependent variable used in this study measures the relation between taxable income and financial reporting income. Because taxable income is not readily available for the sampled firms, several proxies were constructed based on reported data for financial reporting purposes. Two different measures of taxable income and financial reporting were used to develop alternate proxies for the dependent variable. (A more complete description of research design and variable definitions can be found in Appendix B.)

Results

A final sample of 238 firms spanning the 1981-92 period was used to develop multiple regression models. Panels A and B of Table 2 show the descriptive statistics for each of the two proxies of taxable income based on the data for the 238 firms. As shown, both ratios increased in the post-TRA86 period. The industry-adjusted ratios also reflect an increase in the ratios in the post-TRA86 period.

Panel D summarizes the 1985-92 ratios and Panel E shows the effective tax rates for the 1985-92 period. Panel E shows that both measures of effective tax rate declined in 1986 and increased dramatically in 1987, but once again declined in 1988 and 1989 from the 1987 level.

To determine the extent and significance of the increase in the ratio of taxable income to financial reporting income, the statistical test known as ANOVA was performed on both ratios using the pre-TRA86 and post-TRA86 periods as the class variable. Panels A and B of Table 3 show a significant increase in the ratio of taxable income to financial reporting income in the post TRA86 period (p=0.0250; Scheffe Test=A, B).

The Panel C results show that the increase in the ratio of taxable income to financial reporting income is due primarily to an increase in taxable income in the post-TRA86 period and not to a decline in financial reporting income. Panel C shows the increase in taxable income-1 is marginally significant (p=0.0695) but that taxable income-2 is statistically significant at the .05 level (p=0.0406). However, both measures of financial reporting income failed to show a statistically significant change in the post TRA86 period (p=0.7993; 0.7274) over pre-TRA86 levels.

Table 4 shows regression results for purposes of hypothesis testing. The model achieves statistical significance well below the .05 level (p=0.0001). All of the included variables except for STE and AMT attain statistical significance at the .05 level.
Tests of Hypotheses

The hypotheses are tested by examining whether the explanatory variables are statistically significant at the .05 level in their predicted direction. Of the variables included in the model, all except for the ratio of taxable income to financial reporting income for the industry are used for hypothesis testing.

Question 1. This question asks whether the ratio of taxable income to financial reporting income increased in the post-TRA period. In Table 4, the variable representing the 1986 Tax Reform Act, TR, attains statistical significance and has a positive sign as predicted (p=0.0001), suggesting that taxable income expanded at a higher rate than financial reporting income in the post-TRA86 period.

Question 2. This question asks whether the ratio of taxable income to financial reporting income is an increasing function of the firm’s AMT exposure in the post-TRA86 period. Table 4 shows that AMT fails to attain statistical significance at the .05 level (p=0.9443). Therefore, Q₂ cannot be supported. The finding regarding Q₂ must be interpreted with caution because the proxy used for the AMT may not fully account for the AMT position of the firm. As such, the model was re-estimated with two alternate proxies for AMT and with a 1987 cutoff for the effects of TRA86. The results regarding Q₂ remained unchanged, however. The Table 4 results also show highly non-significant coefficients for both AMT and the level of tax exhaustion, STE, which could be the result of multicollinearity between the variables.

The model in Table 4 was re-estimated by rotating out both AMT and STE but the results remained unchanged thereby reducing concerns of multicollinearity. The model was also re-estimated without ACE to account for the possibility of multicollinearity between ACE and AMT, but neither attained a lower p-value than .1017, thereby further reducing concerns that the Table 4 results are significantly affected by multicollinearity.

Question 3. This question asks whether the ratio of taxable income to financial reporting income declined significantly after the replacement of the book income adjustment with the adjusted current earnings adjustment. Table 4 shows that ACE attains statistical significance (p = 0.0157) well below the .05 level but has a positive sign. Therefore, the alternate hypothesis cannot be supported in the hypothesized direction. As with Q₂, the model was re-estimated without AMT and with two alternate proxies for AMT and with a 1990 cutoff date for the ACE. The results did not change with the alternate specifications.

Question 4. This question asks whether increasing levels of tax-exhaustion lower the ratio of taxable income to financial reporting income. Table 4 shows that STE fails to achieve statistical significance at the .05 cutoff (p=0.8493), implying there is no support for the claim that tax exhaustion is related to the ratio of taxable income to financial reporting income. The implication is that the firm’s state of tax exhaustion had little effect on the ratio of taxable income to financial reporting income.

Discussion of Results

The first question tested was whether the ratio of taxable income to reporting income increased in the post-TRA86 period. As the results presented in Table 4 show, there is strong statistical evidence that taxable income has risen relative to financial reporting income.

The second question asks whether a firm’s AMT exposure affected the likeli-
hood of a firm's taxable income increasing relative to financial reporting income. On a related issue, the third question asks whether the shift from the book-income adjustment to the adjusted current earnings adjustment in 1990 affected the relationship between a firm's AMT exposure and the likelihood that taxable income increased relative to financial reported income. The tests performed for this study show no significant relationship between a firm's AMT exposure and its taxable income to financial reported income ratio.

The fourth and final question examined whether the ability of a firm to reduce current taxable income using net operating loss carry-forwards and similar offsets—the firm's level of tax exhaustion—affect the ratio of taxable income to financial reported income. As the results reported in Table 4 show, there is no statistical support for the argument that a firm's level of tax exhaustion is related to the ratio of incomes.

The evidence strongly suggests that taxable income increased significantly as a proportion of financial reporting income in the post-TRA86 period. The increase in the ratio of taxable income to financial reporting income may be due to: (1) a decrease in financial reporting income without regard to taxable income; (2) an increase in taxable income without regard to financial reporting income; or (3) to a decrease/increase in financial reporting income and a concomitant increase/decrease in taxable income. Panel C of Tables 2 and 3 show that the increase in the ratio is due primarily to an increase in taxable income in the post-TRA86 period. Panel D of Table 2 also shows that in 1988, taxable income surpassed financial reporting income for both measures of taxable income. Closer examination of Panel D shows an increasing trend in the ratio of taxable income to financial reporting income until 1992.

The paper finds no evidence that firms managed earnings to reduce or avoid the AMT or that the replacement of the book-income adjustment with the adjusted current earnings adjustment reduced taxable income as a proportion of financial reporting income. The expectation was that the linkage between financial reporting and taxable income under the AMT might have led to earnings management to lower financial reporting income and, therefore, lower AMT liability. A decrease in financial reporting income increases the ratio of taxable income to financial reporting income assuming no change in the definition of taxable income.

The reported results also showed that the replacement of the BIA with the ACE adjustment did not change corporations' earnings management policies. The expectation was that if firms reduced financial reporting earnings to reduce the impact of the AMT, a de-coupling of the AMT from financial reporting practices might reduce the need to lower financial reporting income. The result would be a reversal of earnings reductions under the BIA regime. The apparent lack of significance for the ACE adjustment is logically consistent with the finding for the BIA. That is, if earnings management had little or no effect on taxable income as a proportion of financial reporting income, the replacement of the BIA with the ACE should not significantly affect the relation between taxable income and financial reporting income.

The reported results also show that the firm's state of tax exhaustion had a minimal effect on the relation of taxable to financial reported income. These results imply that the availability of unused tax losses had a negligible effect
on the co-movement in taxable income and financial reporting incomes. One implication is that such losses are reflected for both tax and financial reporting purposes in the same accounting periods.

Limitations
The reported results must be considered in light of two potentially important limitations—(1) the lack of data on taxable income and (2) the failure to control for other potentially important economic phenomena occurring simultaneously with the TRA86 changes. Unfortunately data on taxable income are unavailable for a sample as large and for as many years as are considered in the present study. The alternative is to develop proxies based on financial reporting income. In this regard, prior studies have provided definitions for alternate proxies which are all measured with error. Notwithstanding, the questions posed in this study all focus on the relation between taxable income and financial reporting income which may make the lack of precision in measuring taxable income less important than in situations where prediction of taxable income is the objective.

As with most studies of this nature, other potentially important economic phenomena may also have been present during the TRA86 period, thereby confounding the effects of tax law changes under TRA86 with the nuisance variables. In addition, some of the effects of TRA86 may have been anticipated or delayed. Therefore, the use of a 1986 cutoff to examine changes in financial characteristics may not coincide with economic reality. To account for this possibility, several alternate cutoffs were explored, though the results did not vary significantly with the changing of the cutoff years.

Conclusions
Considered together, the results reported in this study indicate that taxable income increased significantly relative to financial reporting income in the post-TRA86 period. The increase in taxable income does not appear to be driven by earnings management to avoid the alternative minimum tax. The trend towards higher taxable income as a proportion of financial reporting income in the post-TRA86 period has implications for the effective tax burden borne by corporate taxpayers. The benefit of having lower statutory tax rates was clearly offset, at least in part, by the expansion of the tax base under TRA86. Reported data on the aggregate tax burden and the effective tax rate on corporations reported here support this possibility.
Appendix A

The Recent Changes to the Definitions of Taxable Income and Financial Reporting Income

Intangible Drilling Costs (IDCs).
Costs incurred by a taxpayer to develop an oil, gas or geothermal property are either intangible drilling and development costs (IDCs), or depreciable costs. IDCs include amounts paid for labor, fuel, repairs, supplies, etc. relating to the drilling of a well. IDCs are those expenses which are neither incurred for the purchase of tangible property nor part of the acquisition price of an interest in the property.

Subject to certain limitations taxpayers may deduct their IDCs in the year incurred (expensed) whereas they must depreciate those assets which are not IDCs. Consequently, the economic value of the project increases as more expenses are expensed due to the time value of money. On the other hand, as limits on the deductibility of IDCs increase, the economic value of the project decreases.

Prior to TRA86, most producers expensed 80 percent of the IDCs incurred in a taxable year while amortizing the remaining 20 percent over three years. TRA86 increased the statutory percentage of otherwise deductible IDCs from 20 percent to 30 percent for integrated oil companies. The disallowed amount must be amortized over a period of five years or more, rather than the three year period allowed under the pre-TRA86 rules. In addition, IDCs incurred outside the U.S. on productive wells must be amortized over a ten-year period or be recovered through cost depletion. The changes to the IDC provisions broadened the tax base and made drilling more expensive in after-tax terms relative to other investment alternatives.

Installment Sale Reporting. Prior to TRA86, income from an installment sale (a sale under which at least one payment is received after the close of the taxable year in which the sale occurs) is recognized for tax purposes as received. Thus, if 50 percent of the sale price is to be paid in one year and the balance of the sale price is paid in the second year, the seller is able to split the recognition of the income across the two years. TRA86 and The Revenue Act of 1987 denied installment sale reporting on gains on the sale of property held for resale in the ordinary course of business and on inventory items. This change increases taxable income in the post-TRA86 period and changes the relationship between taxable income and financial reporting income.

Limits on Travel and Entertainment Expenses. As a rule, businesses and individuals are allowed to deduct the costs incurred in producing taxable income. Travel and entertainment expenses are generally regarded as normal business costs. TRA86 and subsequent revenue acts instituted ceilings and other limits on the amount of travel and entertainment expenditures that can be deducted for federal income tax purposes. The result is an increase in taxable income in the post-TRA86 period for the same level of pre-TRA86 income.

Income on Long-Term Contracts.
Prior to TRA86, taxpayers were generally able to defer including income from a long-term contract until the year in which the contract is completed and accepted. TRA86 and the Revenue Reconciliation Act of 1989 limited the use of the completed contract method of reporting to home-construction contracts and certain other real estate contracts, thereby accelerating the recognition of income for other taxpayers with long-term contracts. The result is an increase in taxable income in the post-TRA86 period for the
same level of pre-TRA86 income. As with the limits on installment sale reporting, the change affecting long-term contracts increases the ratio of taxable income to financial reporting income in the post-TRA86 period.

**Bad Debt Accrual.** All taxpayers who offer credit in the course of their business understand that some fraction of what is loaned will not be repaid in full. Financial accounting standards require such taxpayers to establish financial reserves to protect the business against the financial repercussions of this "bad debt." TRA86 denied corporate taxpayers the use of the reserve method for bad debts on accounts receivable (small banks were granted a respite). The result is an increase in taxable income in the post-TRA86 period for the same amount of pre-TRA86 income. The increase in taxable income boosts the ratio of taxable income to financial reporting income in the post-TRA86 period for the same level of post-TRA86 financial income.

**Depreciation.** Capital assets generally produce income to the owner over many years. The predominant theory in tax policy prescribes that the cost of an asset should be charged as an expense over the years in which it is expected to generate income. TRA86 lengthened the depreciation recovery period on business equipment and capital leases on such equipment from five to seven years. The lengthening of the recovery period increases the ratio of taxable income relative to financial reporting income as compared with the pre-TRA86 period.

**The Alternative Minimum Tax.** Prior to TRA86, capital-intensive industries were able to obtain significant current year tax savings through large accelerated depreciation deductions, investment tax credits, and other legal tax avoidance measures. Consequently, the tax burden of a corporation in a given year relative to the income it reported on its financial statements often depended on its lines of business (Weiss 1979; Siegfried 1974). This reported tax burden difference resulted in the widespread perception that the tax system was unfair and easily manipulated. While many of the provisions were scaled back or eliminated as part of TRA86, the perception remained that some corporations would, in certain circumstances, make it possible to report financial income while paying little or no income tax. The Alternative Minimum Tax was modified as part of TRA86 to ensure that taxpayers reporting significant amounts of income on their financial statements would pay income tax in the same period. This policy was achieved by creating a parallel tax system which effectively restricts a taxpayer's ability to use deductions and credits to reduce their taxable income. [Tax Foundation 1994]

As part of the development of the AMT, a book-income adjustment (BIA) was added to the taxpayer's alternative minimum taxable income (AMTI). The BIA was equal to 50 percent of the excess of adjusted net book income (i.e., financial reporting income after certain adjustments) over AMTI (i.e., modified taxable income). With the statutory AMT tax rate of 20 percent, the BIA could produce additional corporate tax equal to 10 percent (50 percent * 20 percent) of the income effect of any accounting change, whether or not such a change has a direct effect on cash flow.

In 1990, the BIA was replaced by a new adjustment called adjusted current earnings (ACE). The ACE adjustment raises alternative minimum taxable income by 75 percent of the difference between adjusted current earnings and AMTI. The main difference between the
ACE adjustment and the BIA is that the BIA is partly determined by generally accepted accounting principles and ACE is determined by tax rules.

Changes in the Definition of Financial Reporting Income

Of all the changes in the definition of financial reporting that were promulgated by the FASB in the last decade, perhaps the most significant are Statement of Financial Accounting Standards (SFAS) 106 and 109. Both standards had significant transitory and permanent effects on financial reports of earnings.

SFAS 106 was issued in 1990 to ensure that employers do not understate or underfund post-retirement employee health and other non-pension related benefits. SFAS 106 requires that employers account for post-retirement benefits using the accrual method of accounting. The result is that post-retirement health benefits such as medical costs, the associated service costs, and interest costs will be charged against financial reporting income as accrued, which can be many years before they are actually paid.

SFAS 109 provides guidance on the treatment of income taxes currently payable, revenues, expenses, gains, and losses that are included in the tax base in one period but recorded for financial reporting purposes in a different period. SFAS 109 requires that companies currently recognize the future tax effects resulting from differences between an asset's or liability's tax basis and the corresponding adjusted basis for financial reporting purposes. Under the new statement, the future tax consequences of transactions that are currently reportable for financial reporting purposes are included in the current period's financial statement. A likely consequence is a significant increase in net income and deferred tax assets.
Appendix B

Research Design and Statistical Results

This study employs a model represented by the equation below which relates each firm’s ratio of taxable income to financial reporting income to a set of hypothesized influences of which the most important are the passage of the 1986 Tax Reform Act and whether the firm is subject to Alternative Minimum Tax. The parameters of this equation are estimated using data from 238 firms spanning the 1981 to 1992 period.

\[ y_{i,j,k} = a_0 + a_1 TR_{ij} + a_2 AMT_{ij} + a_3 ACE_{ij} + a_4 STE_{ij} + a_5 IND_{ij} + e_{ijk} \]

Where,

“y” is ratio of taxable income to financial reporting income.
“i” is the individual firm.
“j” is the primary industry of membership.
“k” is the period 1981-92.
“TR” is coded as a zero for 1981-86 and as a one for 1987-92, the coefficient \(a_1\) captures the post-TRA86 change in the ratio of taxable income and financial reporting income for each dollar of sales.
“AMT” is the ratio of depreciation to total assets in the post-TRA86 period, \(a_2\) captures the effect of the post-TRA86 AMT position of the firm on “y.”
“ACE” is the ratio of depreciation to total assets in the 1990-92 period, \(a_3\) captures the effect of the AMT position of the firm on “y.”
“STE” is the ratio of net operating losses carried forward divided by total assets, \(a_4\) captures the effect of the post TRA86 state of tax-exhaustion on “y.”
“IND” is the ratio of taxable income to financial reporting income for the industry, \(a_5\) captures industry specific variations in taxable income and financial reporting income on “y.”
“e” is an error term.

Because of the pooled cross-sectional design of the study, the residual term contains both cross-sectional and time-series error [Pyndick 1976]. Therefore, the parameters may not be constant over the entire sample period (1971-90). One way of addressing this problem is to impose a structure on the error term. A common structure is the autoregressive process under which the residuals from an ordinary least squares (OLS) model are used to estimate a set of autoregressive parameters and the results are used to develop generalized least squares estimates (Kmenta 1986).

Data Source

The sample consists of industrial firms (SIC codes 1000-3999) on COMPSTAT® Annual PST File¹² (Standard and Poor’s Computer Services Inc., 1993). Industry classifications were conducted at the two-digit standard industrial classification (SIC) code level. A list of 31 variables for each firm was extracted over the 1981-92 period. The search produced 4,274 firms with varying levels of missing data for a number of the extracted variables. Those firms with more than two years of missing data for the accounts receivable variable were eliminated, leaving 486 firms. In addition, firms with negative pre-tax income were eliminated leaving 238 firms with mostly complete data over the 1981-92 period. The variables are summarized in Table 1 and a brief discussion of these variables follows.

Variables

Dependent Variable. The dependent variable measures the relation between
taxable income and financial reporting income. Because taxable income is not readily available for the sampled firms, several proxies were constructed based on reported data for financial reporting purposes. Table 1 shows a definition of the two proxies developed [Joint Committee on Taxation 1984; Omer et al. 1991; Pocarno 1986; Wilkie 1988; Stickney and McGee 1982]. Two different measures of taxable income and financial reporting income were used to develop alternative proxies for the dependent variable. Table 1 shows the definitions for both taxable income and financial reporting income along with the definitions of the explanatory variables.

Explanatory Variables. The independent variables include: (1) TRA86, (2) post-TRA86 AMT exposure (AMT), (3) post-1989 ACE effects (ACE), (4) the state of tax exhaustion (STE) and (5) the average of the ratio of taxable income to financial reporting income for the primary industry of the firms (IND).

The variable TR measures shifts in the intercept of the ratio of taxable income to financial reporting income due to TRA86. The period before TRA86 was coded as a zero and the period after TRA86 was coded as a one. The post-TRA86 AMT exposure (AMT) of the firm was measured by way of several proxies. AMT exposure is measured as the ratio of depreciation (item #103 on COMPUSTAT) to total assets and multiplied by TR. The result is that AMT will be zero for 1981-86 and one multiplied by the ratio of depreciation to total assets for 1987-92. Likewise ACE is zero for years before 1990 and is one multiplied by the ratio of financial reporting depreciation divided by total assets for 1990-92. That is, both variables are zero for years before their enactment and the ratio of depreciation to total assets after their enactment.

STE, the firm’s state of tax-exhaustion, is defined as the net operating losses carried forward divided by total assets. Several measures of effective tax rate were used in lieu of the tax exhaustion variables but the results did not change meaningfully from those reported here. In addition, STE was converted into two classification variables for states of full and partial tax exhaustion compared with full taxation. When the variables are included for the full sample period there were significant effects for the state of full tax-exhaustion but the signs and levels of statistical significance of the remaining variables did not change.

IND is defined as the ratio of taxable income to financial reporting income and is intended to control for industry specific variation in the ratio of taxable income to financial reporting income.
# Table 1

## Data Sources and Definition of Income

<table>
<thead>
<tr>
<th>Variable</th>
<th>Symbol</th>
<th>Definition</th>
<th>Compustat Data Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Reporting Income-1</td>
<td>FRI-1</td>
<td>Pretax book income minus equity income from unconsolidated subsidiaries and income from extraordinary items and discontinued operations plus (income from minority interests for firm i in period j)</td>
<td>#18 + #49 + #16 + ((-1.0 * #48) - #55)</td>
</tr>
<tr>
<td>Financial Reporting Income-2</td>
<td>FRI-2</td>
<td>Pretax book income minus equity income from unconsolidated subsidiaries plus income from minority interests for firm i in period j</td>
<td>#18 + #49 + #16 - #55</td>
</tr>
<tr>
<td>Taxable Income-1</td>
<td>TAXI-1</td>
<td>Pretax book income minus (equity income from unconsolidated subsidiaries and income from extraordinary and discontinued operations) plus income from minority interests for firm i in period j minus (deferred tax expense divided by marginal tax rate)</td>
<td>[#18 + #49 + #16 + ((-1.0 * #48) - #55) - #50 / marginal tax rate]</td>
</tr>
<tr>
<td>Taxable Income-2</td>
<td>TAXI-2</td>
<td>Pretax book income minus (equity income from unconsolidated subsidiaries) plus income from minority interests for firm i in period j plus (deferred tax expense divided by marginal tax rate)</td>
<td>[#18 - #49 + #16 - #55 + #50 / marginal tax rate]</td>
</tr>
</tbody>
</table>
Table 2
Descriptive Statistics

Panel A: Ratio of Taxable Income to Financial Reporting Income

<table>
<thead>
<tr>
<th>Description</th>
<th>Before TRA86</th>
<th>After TRA86</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxable Income/Financial Reporting Income-1</td>
<td>0.8669</td>
<td>1.0283</td>
</tr>
<tr>
<td>Taxable Income/Financial Reporting Income-2</td>
<td>0.8575</td>
<td>1.0300</td>
</tr>
<tr>
<td>Sample Size</td>
<td>1431</td>
<td>1336</td>
</tr>
</tbody>
</table>

Panel B: Industry-Adjusted Ratio of Taxable Income to Financial Reporting Income

<table>
<thead>
<tr>
<th>Variables</th>
<th>Before TRA86</th>
<th>After TRA86</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxable Income/Financial Reporting Income-1</td>
<td>1.0342</td>
<td>1.0694</td>
</tr>
<tr>
<td>Taxable Income/Financial Reporting Income-2</td>
<td>1.0132</td>
<td>1.0695</td>
</tr>
<tr>
<td>Sample Size (number of firms 238)</td>
<td>1431</td>
<td>1336</td>
</tr>
</tbody>
</table>

Panel C: Industry-Adjusted Taxable Income and Financial Reporting Income by Tax Period

<table>
<thead>
<tr>
<th>Description</th>
<th>Before TRA86</th>
<th>After TRA86</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxable Income-1</td>
<td>1.3984</td>
<td>1.5029</td>
</tr>
<tr>
<td>Taxable Income-2</td>
<td>1.3038</td>
<td>1.4542</td>
</tr>
<tr>
<td>Financial Reporting Income-1</td>
<td>1.1687</td>
<td>1.1892</td>
</tr>
<tr>
<td>Financial Reporting Income-2</td>
<td>1.1493</td>
<td>1.1774</td>
</tr>
<tr>
<td>Sample Size</td>
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<td>1336</td>
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</tbody>
</table>
### Panel D: Interperiod Mean Values

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<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxable Income/Financial Income-1</td>
<td>0.8824</td>
<td>0.8411</td>
<td>0.9227</td>
<td>1.0336</td>
<td>1.0079</td>
<td>1.0894</td>
<td>1.1577</td>
<td>1.0095</td>
</tr>
<tr>
<td>Taxable Income/Financial Income-2</td>
<td>0.8837</td>
<td>0.8461</td>
<td>0.9172</td>
<td>1.0254</td>
<td>1.0028</td>
<td>1.0948</td>
<td>1.1496</td>
<td>1.0430</td>
</tr>
<tr>
<td>Sample Size</td>
<td>180</td>
<td>165</td>
<td>182</td>
<td>179</td>
<td>179</td>
<td>164</td>
<td>159</td>
<td>152</td>
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</tbody>
</table>

### Panel E: Interperiod Effective Tax Rates

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Effective Tax Rate-1</td>
<td>0.2300</td>
<td>0.2257</td>
<td>0.3090</td>
<td>0.2182</td>
<td>0.2216</td>
<td>0.2412</td>
<td>0.2533</td>
<td>0.2036</td>
</tr>
<tr>
<td>Effective Tax Rate-2</td>
<td>0.2286</td>
<td>0.1900</td>
<td>0.2658</td>
<td>0.2398</td>
<td>0.2106</td>
<td>0.2244</td>
<td>0.2457</td>
<td>0.2098</td>
</tr>
<tr>
<td>Sample Size</td>
<td>180</td>
<td>165</td>
<td>182</td>
<td>179</td>
<td>179</td>
<td>164</td>
<td>159</td>
<td>152</td>
</tr>
</tbody>
</table>
### Table 3
ANOVA Results for TRA86 Effect on Income

#### Panel A: ANOVA Results for Overall Effect of TRA86

<table>
<thead>
<tr>
<th>Class Variables</th>
<th>Sum of Squares</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F/t Statistic</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>1.3837</td>
<td>1</td>
<td>1.3837</td>
<td>5.03</td>
<td>0.0250</td>
</tr>
<tr>
<td>Error</td>
<td>730.1376</td>
<td>2655</td>
<td>–</td>
<td>–</td>
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</tr>
</tbody>
</table>

#### Panel B: Scheffe Test for TRA86 Effect

<table>
<thead>
<tr>
<th>TRA86 Effect</th>
<th>Group Mean</th>
<th>Scheffe Grouping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before TRA86</td>
<td>1.0667</td>
<td>B</td>
</tr>
<tr>
<td>Error</td>
<td>1.0190</td>
<td>A</td>
</tr>
</tbody>
</table>

#### Panel C: ANOVA Results for Taxable Income and Financial Reporting Income

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pre-TRA86</th>
<th>Post-TRA86</th>
<th>p-Value</th>
<th>Scheffe Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxable Income-1</td>
<td>1.3984</td>
<td>1.5029</td>
<td>0.0695</td>
<td>A, A</td>
</tr>
<tr>
<td>Taxable Income-2</td>
<td>1.3038</td>
<td>1.4542</td>
<td>0.0406</td>
<td>A, B</td>
</tr>
<tr>
<td>Financial Reporting Income-1</td>
<td>1.1891</td>
<td>1.1687</td>
<td>0.7993</td>
<td>A, A</td>
</tr>
<tr>
<td>Financial Reporting Income-2</td>
<td>1.1493</td>
<td>1.1774</td>
<td>0.7274</td>
<td>A, A</td>
</tr>
</tbody>
</table>
Table 4
Regression Results

\[ y_{i,j,k} = 0.5418 + 0.1354 TR_{i,j} + 0.0459 AMT_{i,j} + 1.2262 ACE_{i,j} - 0.1011 STE_{i,j} + 0.3394 IND_{i,j} + e_{i,j,k} \]

<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimate</th>
<th>Error</th>
<th>T Ratio</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.5418</td>
<td>0.0445</td>
<td>11.9730</td>
<td>0.0001</td>
</tr>
<tr>
<td>TR</td>
<td>0.1354</td>
<td>0.0348</td>
<td>3.8920</td>
<td>0.0001</td>
</tr>
<tr>
<td>STE</td>
<td>-0.1011</td>
<td>0.0532</td>
<td>-0.1900</td>
<td>0.8493</td>
</tr>
<tr>
<td>AMT</td>
<td>0.0459</td>
<td>0.6581</td>
<td>0.0700</td>
<td>0.9443</td>
</tr>
<tr>
<td>ACE</td>
<td>1.2262</td>
<td>0.5071</td>
<td>2.4180</td>
<td>0.0157</td>
</tr>
<tr>
<td>IND</td>
<td>0.3394</td>
<td>0.0504</td>
<td>6.7380</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Sample Size | 1824
References


Pindyck, R.S. 1976. Econometric models and economic forecasts.

Pocarno, T. M. 1986. Corporate Tax


*Standard and Poor's Compustat Data.* 1993.


Endnotes

1 Altshuler and Auerback (1990) argue that firms can be in one of three mutually exclusive tax states. According to the authors, in state-1, the firm pays no taxes in the current year because unused net operating losses, foreign tax credits, and other business credits from prior years fully offset pre-tax operating income. In state-2, the firm pays some taxes because unused losses and tax credits from prior years only partly offset the current year's income. In state-3, the firm's current year's income is fully taxable because pre-tax operating income is fully taxable (tax exhausted).

2 The two measures of effective tax rate are derived by dividing federal income tax expense by both proxies of taxable income.

3 Only one set of results is presented because both ratios (proxies for taxable income) yield similar results.

4 The Panel C numbers for both Tables 2 and 3 are based on only those firms with positive taxable income and financial reporting income because negative ratios are somewhat difficult to interpret. The relationships do not change, however, when all firms are included. Some firms were trimmed from the analysis where the ratios were deemed to be outliers on the normal probability plot.

5 An increase in the ratio of taxable income to financial reporting income can result from either a decline in the denominator, which is financial reporting income, or an increase in the numerator, which is taxable income.

6 The unadjusted ratios were less clear with respect to the source of the increase in the ratio of taxable income to financial reporting income. Both measures of taxable income and financial reporting income show little difference between the pre-TRA86 and post-TRA86 period.

7 The results should be interpreted with caution because of the possibility of over-estimating or under-estimating the effects of the included variables. Notwithstanding, the hypotheses focus on the functional relationship between the included variables and the ratio of taxable income to financial reporting income rather than that of predicting the aforementioned ratio.

8 Results from the AUTOREG Procedure were not significantly different from those produced from the Multiple Regression Procedure.

9 Several alternate proxies for AMT exposure failed to provide results different from those reported herein.

10 Several other proxies of tax-exhaustion, including the ratio of net operating losses to pre-tax income, failed to provide results different from those reported herein.

11 Exceptions include sales of time-share units, residential lots where the seller is not to make improvements, or any property used or produced in a farming business.

12 Primary, supplementary, and tertiary data files contain information on companies listed on the New York Stock Exchange and American Stock Exchange.

13 The definitions of taxable income are based on the denominators used to measure effective corporate tax rates.
The results were generally invariant to the proxy used for taxable income.

Two alternate codings of TR (a 1987 cutoff and a 1985 cutoff) failed to generate different results from those reported herein.

The ratio of financial reporting depreciation to total assets was also used as a proxy for AMT exposure but the results did not differ meaningfully from those reported herein.

Each firm's ratio of taxable income to financial reporting income was also scaled by the same ratio at the industry level but the results were invariant to the alternative coding.