



MIT Sloan School of Management

**Working Paper 4332-01
May 2001**

THE RELATION BETWEEN FINANCIAL AND TAX REPORTING MEASURES OF INCOME

Gil B. Manzon, Jr. and George A. Plesko

© 2001 by Gil B. Manzon, Jr. and George A. Plesko. All rights reserved.
Short sections of text, not to exceed two paragraphs, may be quoted without explicit
permission provided that full credit including © notice is given to the source.

This paper also can be downloaded without charge from the
Social Science Research Network Electronic Paper Collection:
http://papers.ssrn.com/abstract_id=264112

The Relation Between Financial and Tax Reporting Measures of Income*

Gil B. Manzon, Jr.[†] and George A. Plesko[‡]

To be presented at the

Tax Law Review Symposium on Corporate Tax Shelters

May 4, 2001

We examine the magnitude and sources of difference between income for tax and financial reporting purposes using publicly available data from 1988 to 1998. We find evidence that the book-tax income spread has generally increased over time, but that a relatively small set of variables are able to explain this increase. We also find that these same variables explain a large percentage of the variation in the book-tax spread across firms. While neither supporting, nor disproving, the existence and growth in tax sheltering behavior, the results do suggest that financial statement-based measures of income have become less representative of firms' taxable income.

*Financial support for this paper was provided by the American Tax Policy Institute (www.americantax.org). Views expressed in this paper are those of the authors, and do not necessarily represent those of the ATPI or any of its members. We have benefitted from discussions with or comments from Jackie Levinson, Deborah Schenk, Terry Shevlin, Janet Spragens, Marty Sullivan, G. Peter Wilson, George Yin, and participants at the January 2001 American Tax Policy Institute Roundtable. We would like to thank Rebecca Zarutskie and Xu Li for exceptional research support. Any errors are the responsibility of the authors.

[†]Fulton Hall 536, Carroll School of Management, Boston College Chestnut Hill, MA 02167-3808, (617) 552-4637, manzong@bc.edu

[‡]Corresponding author: E52-325, Sloan School of Management, Massachusetts Institute of Technology, 50 Memorial Drive, Cambridge, MA 02142-1347, (617) 253-2668, gplesko@mit.edu

The Relation Between Financial and Tax Reporting Measures of Income

I. Introduction

II. Foundations of Income Measurement

- A. Financial Accounting
- B. Tax Accounting
- C. Sources of Differences and Related Accounting Issues

III. Financial Reporting of Taxes Under SFAS 109

IV. Methodology

- A. Potential Data Sources
 - 1. Tax Return Data
 - 2. Financial Accounting Data
- B. Using Financial Statements to Infer Taxable Income
 - 1. Estimating Current Taxes and Taxable Income
 - 2. Estimating the Difference Between Financial Reporting Income and Taxable Income
 - 3. Limitations of the SPREAD Measure
 - 4. Factors Likely to Affect SPREAD
 - a. Demand for Tax Favored Investment and Financing Actions
 - b. Direct Sources of Investment related Timing Differences
 - c. Permanent Differences
 - d. Noise Factors.

V. Descriptive Results

- A. Data
- B. How Significant is the Book-Tax Spread

VI. Explaining the Spread

- A. Estimating the Sources of the Book-Tax Spread
- B. Results

VII. Conclusions

I. Introduction

Publicly traded firms are subject to separate accounting rules for tax and financial reporting purposes. As a result, the amount of income reported under each set of rules differs. However, under each set of rules firms provide information about income reported under the other. For tax purposes, firms reconcile the differences between their book income and their taxable income in Schedule M-1. In Securities and Exchange Commission (SEC) filings, firms delineate the portion of their tax expense which is currently owed from that which has been deferred because of differences in the timing of revenues or expenses. Permanent differences between tax and financial reporting income are separately identified.

Treasury, in both its report on tax shelters and in testimony, has suggested the disparity in both the levels and growth rates between book and taxable income as reported in Schedule M-1 is partial evidence of the growth in shelters. Yet, as Sullivan (2000) and Plesko (2000b) have pointed out, there has yet to be a thorough analysis of either tax return or publicly available data for alternative structural explanations of the differences between tax and financial reporting income.

In this paper we examine the magnitude and source of differences between book and taxable income. We examine the financial statements of corporations from 1988 to 1999 to infer their taxable income and to calculate the difference between the amounts of income reported under each set of accounting rules. From this set of data, we examine the trends in reported income under the two systems and estimate the amount of variation between the two measures that can be explained by economic factors and the amount of variation that can be explained by different tax and accounting rules. Our goal is to both to estimate the effects of these various factors on book-tax differences, and to quantify the extent to which book-tax differences can be explained

by these structural factors. We interpret any unexplained residual as attributable to other factors, one of which may be tax-shelter activity.

We find evidence that the book-tax income spread has generally increased over time, but that a relatively small set of variables are able to explain this increase, and explain a large percentage of the variation in the book-tax spread across firms. While neither supporting, nor disproving, the existence and growth in tax sheltering behavior, the results do suggest that financial statement-based measures of income have become less representative of firms' taxable income, but in predictable ways.

In the next section of this paper we describe the objectives influencing the determination of tax and financial accounting rules. In Section III we discuss the financial reporting rules that make it possible to estimate taxable income using publicly available financial information. In Section IV we explore the advantages and disadvantages of various data sources used to estimate book-tax differences, and explain our approach to estimating taxable income. In Section V we present estimates of the book-tax spread over time for samples identified using several different data screens. In Section VI we detail the empirical approach we take in estimating the sources of the book-tax income spread, and present the results of the estimation. In the final section we present preliminary conclusions and suggestions for future work.

II. Foundations of Income Measurement

A. Financial Accounting

Statement of Financial Accounting Concepts No. 1 (CON1), issued in 1978, outlines the objectives of financial reporting. Its essential elements are that financial accounting provide information useful to investors and creditors in making investment and other decisions about

firms. Concept 2 (CON2), "Qualitative Characteristics of Accounting Information," issued in 1980, describes the characteristics of accounting information that make it useful. Of the five qualities outlined, the first two, relevance and reliability, are considered the primary qualities. By relevant, the information provided should be helpful to external users in making their decisions. Reliability, in the context of CON2, merely implies the data presented "represents what it purports to represent." To be considered useful, it is assumed financial information must be both relevant and reliable.

The other three characteristics of quality financial accounting information are comparability and consistency, materiality, and the extent to which the benefits generated from the information's use exceed the costs associated with supplying the information. The standards of comparability and consistency suggest financial accounting information provided by firms be similar to the information provided by other firms, and that firms use accounting methods consistently over time. Importantly, these criteria do not require the financial accounting rules used by different firms to be implemented uniformly. This is in contrast to the approach taken in much of the tax law where uniformity in the accounting for economic events is required.

Materiality is an issue the Securities and Exchange Commission has recently provided guidance on¹, but generally refers to whether information, regardless of its relevance or reliability, is of sufficient magnitude to affect users' decisions. Similarly, CON2 recognizes that the collection and dissemination of information is not costless, and that "In order to justify requiring a particular disclosure, the perceived benefits to be derived from the disclosure must exceed the perceived costs associated with it."

Because financial statements are designed to provide information to shareholders and others

¹U.S. Securities and Exchange Commission (1999).

to evaluate firm performance, the accounting system places great weight on consistency over time within the firm, but less weight on uniformity of all firms to identical assumptions regarding their businesses' accounting rules. Indeed, the discretion left by accounting standards for firm managers to differ in their application of the accounting rules is viewed as a virtue of the system. Specifically, it is generally supposed that allowing managers financial reporting discretion can increase the quality of the information they provide (Palepu et al. 2001). As a result of this discretion, managers of firms within the same industry can make different determinations about the amounts of revenue or expense to recognize in any given period to provide more complete information on their firms' unique circumstances to their respective shareholders.²

Worth noting within CON1 is the explicit recognition that tax authorities and others may have informational needs beyond those of the general user, but also the authority to obtain necessary information on their own:

... both the information needed to enforce tax laws and regulations and the information needed to set rates for public utilities are specialized needs. However, although both taxing authorities and rate-making bodies often use the information in financial statements for their purposes, both have the statutory authority to require the specific information they need to fulfill their functions and do not need to rely on information provided to other groups. (Paragraph 26)

Continuing, CON1 makes explicit that the goals of financial accounting are not based on assisting

²An example of these differences can be seen in the application of SFAS 86, "Accounting for the Costs of Computer Software to Be Sold, Leased, or Otherwise Marketed." A series of Harvard Business School cases, "Sierra On-Line (A)," "Sierra On-Line (B): An Analyst's Perspective," and "Sierra On-Line (C): The Insiders' Perspective: An Interview with Ken and Roberta Williams" show that the percentage of software development costs capitalized by Sierra (and therefore not recognized as an expense in the current year) was dramatically higher than other firms in the industry. Further examination of the company's business model, coupled with the insight of the company's president and lead software designer, suggest its operations were sufficiently unique in the industry to justify its deviation from industry norms.

regulatory authorities:

The objectives in this Statement are those of general purpose external financial reporting by business enterprises. The objectives stem primarily from the informational needs of external users who lack the authority to prescribe the financial information they want from an enterprise and therefore must use the information that management communicates to them. (Paragraph 26)

B. Tax Accounting

A primary objective of the Internal Revenue Code (IRC) is to provide a framework for the efficient and equitable determination of tax liabilities and the subsequent collection of revenue to fund governmental operations. To more effectively monitor compliance and collection, the IRC allows fewer choices in the application of accounting methods to determine taxable income than are available to determine financial reporting income. A secondary objective of the IRC is to provide incentives for firms to engage in particular activities. Such incentives manifest in the reduction of the present value of taxes payable.

Tax accounting does not allow certain approaches to income and expense recognition that are mandatory for financial accounting, such as reserves for warranty claims, or the deferral of income on certain types of sales that have a right-to-return or price protection. Even when both systems allow for the same expense the measurement rules may be very different. For example, for financial reporting purposes firms can calculate depreciation based on idiosyncratic determinations of specific asset lives and residual values that reflect their economic value. In contrast, for tax purposes, depreciation is based on explicit asset classifications that, on average, appear to allow faster recovery deductions than implied by economic depreciation.³

In contrast to the rule-making process for financial reporting, the rules governing the

³See U.S. Treasury (2000) for a discussion and review of depreciation policy.

determination of taxable income and the amount of taxes to be paid on taxable income are subject to relatively frequent changes by legislative action. Over our study period, the number of changes made to accounting practices for applicable to the determination of taxable income was far greater than the number of changes made to accounting practices applicable to the determination of income for financial reporting purposes.

C. Sources of Differences and Related Accounting Issues

Beyond the differing objectives of financial reporting and tax rule makers, the incentives of preparers likely differs with respect to financial reporting and tax reporting. Specifically, managers of firms may have incentives to make choices that increase income reported to shareholders while at the same time making choices that minimize reported taxable income. An extensive empirical literature has explored the interaction of tax and financial reporting incentives (Shackelford and Shevlin, 2000). It is apparent from this literature that neither tax nor financial reporting considerations consistently dominates the other.

The conflicting objectives guiding the development of rules for financial reporting and tax reporting and the differing incentives of preparers with respect to the two different measurements ultimately result in differences between financial reporting income and taxable income.

III Financial Reporting of Taxes Under SFAS 109⁴

Financial accounting standards-setters recognize the amount of income calculated under each method is different, and have adopted various mechanisms over time so that users of financial reports can infer current taxable income and project taxable income that may result from the

⁴“Accounting for Income Taxes” issued February 1992.

application of different accounting standards to past transactions. Under SFAS 109 firms report a tax expense calculated from current year financial reporting income, delineating the portion currently owed from that deferred due to differences in the measurement of income under each system. By definition:

$$\text{Tax Expense} = \text{Pretax "Taxable" Income} * \text{Statutory Tax Rate} \quad (1)$$

$$\text{Tax Expense} = \text{Current Tax Expense} + \text{Deferred Tax Expense} \quad (2)$$

There are two sources of difference between financial reporting and taxable income. First, tax and financial reporting rules may allow for differences in the timing of revenue and expense recognition. These timing differences will result in differences in the amount of income recognized for financial reporting and tax purposes for a given period of time, but will net to zero over time. For example, consider depreciation of tangible assets. For financial reporting purposes, depreciation is generally calculated on a straight-line basis over an estimate of an asset's expected useful life (to some residual value). For tax purposes, depreciation is generally calculated using an accelerated method (to no residual value). In the early years of an asset's life, accelerated depreciation for tax purposes will result in taxable income being lower than income for financial reporting purposes. Since total depreciation over an asset's life can sum to no more than the asset's cost, depreciation taken in the later years of an asset's life will be lower for tax purposes than for financial reporting purposes. In the early years of an asset's life, firms will record deferred tax liabilities (and reduce reported income by deferred tax expenses) to reflect the expectation that future tax liabilities will be higher than current tax liabilities since, all

else equal, future depreciation for tax purposes will be lower than current depreciation for tax purposes. As depreciation for tax purposes declines in future years to a level below that reported for financial reporting purposes, taxable income will become greater than income for financial reporting purposes and deferred tax liabilities will become “payable.” At this point, deferred tax expense will reverse and current tax expense will increase. The benefit to the firm from using accelerated depreciation for tax purposes is equal to the present value of the accelerated deductions versus those that would result from the use of straight-line depreciation.

The second source of difference between financial reporting and taxable income arises when revenue or expense is recognized under one system but not the other. For example, interest on municipal bonds and a portion of dividends received from other corporations are generally excluded from the calculation of a corporation’s taxable income, but considered income for financial reporting purposes. Unlike timing differences discussed above, these differences do not reverse (and are thus referred to as permanent differences) and do not give rise to deferred tax assets or liabilities and related expenses. Firms are required to quantify permanent differences in a reconciliation of the firm’s effective tax rate (defined as tax expense divided by pretax income) to the federal statutory tax rate.

In addition to these measurement differences, it is also worth noting that the entity encompassed by financial reports will generally be more inclusive than the one for tax purposes. For financial reporting purposes, firms are required to file consolidated financial statements for all operations in which the parent has at least a 50 percent interest. For tax purposes, consolidation is voluntary and not permitted unless there is at least 80 percent ownership. As a result, an observed set of consolidated financial statements is likely to include any number of separate taxable entities. These differences can be significant, and have been discussed by Dworin (1985),

Manzon and Plesko (1996), and Plesko (1999, 2000a).

IV. Methodology

A. Potential Data Sources

1. Tax Return Data

Although there exists no publicly available tax return information at the entity level that can be used in this study, it is worth noting the advantages and disadvantages tax return data could bring to understanding this issue. Further, such a discussion is important in judging the ability, and limitations, of using financial statement information and making any inferences based upon such data.

Tax return data is clearly well suited for quantifying the reported differences between book and tax reporting in the current year through the Schedule M-1. Schedule M-1 of the Form 1120 begins with a firm reporting its after-tax book income on the same consolidated entity as the return, and then adds back the provision for taxes. The sum of these two items is pre-tax book income. From there, Schedule M-1 provides a reconciliation of the differences, though with the exception of depreciation and tax-exempt interest there is little specific identification of the exact causes.

Schedule M-1 has been used by Treasury to produce "Figure 1" in their 1999 report on Tax Shelters⁵, which shows aggregate book and taxable income reported by a select group of firms from 1987 to 1996, and Figures 1 and 2 of Treasury Assistant Secretary (Tax Policy) Jonathan Talisman's March 8, 2000 testimony⁶, which provides an updated graph of book and taxable

⁵U.S. Department of the Treasury(1999), p.33.

⁶See Talisman (2000).

income through 1997 and an estimate of the book-tax spread, respectively. These two graphs from the Treasury testimony are reproduced here as Figures 1 and 2.

Though clearly unique, tax return information can provide only a limited amount of insight into understanding the causes of book-tax differences. First, unlike financial statements, tax returns (or more specifically, the data collected from tax returns) do not provide as much information on many types of firms' transactions (nor are they intended to) as financial statements. Financial statements, and their notes, provide greater detail on revenue and expense recognition methods and cash flows than do tax returns. Examples of these types of transactions, and the way in which they can be examined with financial data, are described below. Second, financial statements provide more information about the past, and report the cumulative effects of many accounting decisions, whereas tax returns primarily provide information for the current year. Finally, and of particular importance in attempting to analyze tax shelters, given that shelters are designed to reduce taxable income it is unlikely that tax return data by itself will yield clues to the presence or magnitude of sheltering activity.

In fact, given the potentially competing tax and financial reporting incentives, a well-designed shelter may well reduce taxable income while leaving income reported for financial purposes undiminished.⁷ While any reporting difference will be reflected in the Schedule M-1, the degree of detail within the schedule is insufficient to easily make inferences about sheltering activities.⁸

2. Financial Accounting Data

⁷Bankman (1999) provides anecdotal evidence on a variety of tax shelter schemes.

⁸This lack of specificity was part of the motivation for increased disclosure of tax avoidance transactions, as outlined in Talisman (2000)

We use financial statements to obtain financial reporting income, estimates of taxable income, and the measures of factors that might be responsible for differences between the two. As noted in Section II, firms are required to disclose their current and deferred tax positions, on both an annual and cumulative basis, as well as quantify the extent to which taxes are not being accrued due to permanent differences in the definition of income under each system.

The advantage of using financial statements to examine the difference between financial and taxable income is that financial statements provide data that make it possible to examine a broad range of possible explanations for divergent growth rates in financial and taxable income. For example, consider the interpretation of recent evidence of a decline in corporate tax receipts as indicative of tax shelter activity.⁹ As noted by Sullivan (2000),¹⁰ a number of economic factors other than sheltering activities may explain the decrease corporate tax receipts (e.g., some economic factors include increased exercise of significantly “in-the-money” non-qualified stock options as well as increased investment in tax favored assets). Financial statement data will allow for an examination of a broader range of possible causes of any book tax differences than tax return data. In the next section we examine in detail various economic activities that may lead to differences in the amount of income reported to tax authorities than reported to shareholders.

B. Using Financial Statements to Infer Taxable Income

1. Estimating Current Taxes and Taxable Income

As detailed in equations (1) and (2), the total tax expense (benefit) reported by companies

⁹Sullivan (1999a, 1999b) and Kies (1999).

¹⁰Tax Notes (January 17), pp. 309-313

under SFAS 109 is equal to the sum of current tax expense (related to current period taxable income) plus deferred tax expense (related to current period timing differences). We base our estimate of taxable income on firms' reported current tax expense.

Specifically, current period U.S. domestic taxable income can be estimated as current federal tax expense divided by the statutory tax rate:

$$\text{Current Federal Tax Expense (Compustat annual data item 63) / Statutory tax rate} \quad (3)$$

Variants of this measure have been used in a variety of studies examining the sources of differences in firms' effective tax rates. A survey of the measures used in these other studies is presented in Table 1.¹¹

Several factors may limit the ability to estimate taxable income using financial statement data:

a. Differences in the reporting entity

Financial accounting standards require consolidation of all firms in which the parent has more than fifty-percent ownership. For tax reporting, consolidation is voluntary and does not occur unless there is eighty-percent ownership. To the extent that the variable "Current Federal Tax Expense" does not reflect the consolidated entity's tax expense the estimate of taxable income will be in error.¹²

¹¹With the exception of Zimmerman (1984), the various studies of corporate effective tax rates, summarized by Omer et al (1991) and Callihan (1994) use some variant of net income under financial reporting rules as the denominator.

¹²See Dworin (1985), Manzon and Plesko (1996), and Plesko (1999) for further discussion.

b. Operating losses

A second factor that may limit the ability to estimate corporate taxable income using financial statement data is the presence of net operating loss (NOL) carryforwards. Specifically, during all but two years of our sample period, a firm generating a taxable loss in one year could carry that loss back to offset taxable income in the three previous years or forward to offset taxable income earned in the subsequent 15 years.¹³ The three-year carryback rule limits the potential current tax benefit from operating losses to the sum of taxes paid in the three years preceding the loss. Estimated taxable income based on the reported current tax benefit when current period operating losses exceed taxable income in the three previous years will underestimate the extent of current taxable loss.

c. Non-qualified stock option compensation

While corporations can deduct employee compensation related to non-qualified stock options in determining taxable income, this deduction does not reduce current tax expense. Rather, it is reflected as a reduction in current tax liability.

Consider the following example: Company A has taxable income in 1999 before consideration of non-qualified stock compensation of \$100 million and faces a 35% tax rate. Also, assume that Company A has non-qualified stock compensation totaling \$40 million. Consistent with reported income before non-qualified stock compensation, Company A will report a current tax expense of \$35 million and record a tax liability of \$35 million. However, Company A will not have to pay \$35 million in tax. Specifically, it will reduce taxable income \$40 million as a result of non-qualified stock compensation to \$60 million (\$100 million less \$40

¹³The carryback carryforward periods were changed in 1997 to 2 and 20, respectively.

million in non-qualified stock compensation expense). The resulting tax liability will be \$21 million ($\$60 \text{ million} * .35$). Company A will reduce its tax liability by \$14 million ($\$40 * .35$) and, rather than reducing tax expense, it will increase contributed capital by \$14 million.

Thus, using equation (3), the presence of non-qualified stock option compensation will lead to the systematic overestimation of corporate taxable income.

While corporate taxable income and the related corporate tax obligation is systematically overestimated when companies compensate employees using non-qualified stock options, the magnitude of overestimation is not a proxy for tax sheltering activity. Specifically, while companies do not reduce their reported tax expense at the same time they reduce their tax obligations by compensating employees with non-qualified stock options, employees who receive non-qualified stock option compensation must report that compensation as ordinary income on their individual tax returns and pay tax accordingly. In effect, non-qualified stock option compensation shifts the actual payment of tax from corporations to individuals. The loss to the Treasury from this shift is equal to the amount of non-qualified stock option compensation multiplied by the difference between the corporate and individual tax rates. If the corporate rate is less than the individual rate, the Treasury is better off as a result non-qualified stock option compensation. If the corporate rate is greater than the individual rate, the Treasury is less well off as a result non-qualified stock option compensation.

It is also important to note that while this accounting treatment will lead to systematic overestimation of firms' tax liabilities and taxable income, it will not affect any estimate of the *difference* between book and taxable income when using financial statement information. Specifically, neither book income as reported in financial statements nor taxable income as inferred from financial statements are reduced by non-qualified stock option compensation. As

a result, when calculating the difference between book income and taxable income, the effect of stock options will be completely removed.

Consider again the previous example, with the added assumption that the treatment of stock options is the only source of difference between financial and tax accounting measures of income. If one were to calculate the book tax difference based upon the schedule M-1, the firm would report pretax financial income of \$100 million, taxable income of \$60 million, and deductions not charged against book income of \$40 million. This \$40 million would be included as an unexplained book-tax difference in both Figures 1 and 2. When estimating this difference from financial statement information, the book income amount will be unchanged (\$100 million) and the estimate of taxable income will be based upon the amount of tax that would be paid in the absence of the \$40 million stock compensation expense. This accounting treatment yields an estimate of taxable income of \$100 million ($\$35 \text{ million} / 0.35$), eliminating the book tax difference caused by stock options. As a result, we do not need introduce variables to control for the extent to which firms utilize non-qualified stock compensation in our regression estimates. Compared to the Treasury's measures of the book-tax spread, presented in Figures 1 and 2, in which taxable income is reduced by non-qualified stock compensation but book income is not, our estimates of the book-tax spread will be smaller.

Reported evidence indicates that non-qualified stock option compensation has had a significant effect on corporate tax revenue, and, by extension, the Treasury's measures of book-tax differences. A recent report by Bear Stearns (2000) estimates that for the seven largest companies in the NASDAQ 100 index, the tax benefit from stock options may exceed ten percent of their cash flow from operations. Microsoft, in its 1999 Annual Report, reported a tax benefit from stock options of \$3.1 billion and tax expense (exclusive of these tax benefits) of \$4.1

billion. An estimate of the book-tax difference of these options can be obtained by dividing the tax benefit by Microsoft's reported effective tax rate of 36.9 percent, yielding \$8.4 billion. This represents nearly 71 percent of Microsoft's reported income before taxes of \$11.9 billion.¹⁴

2. Estimating the Difference between Financial Reporting Income and Taxable Income

We define the variable SPREAD as the difference between U.S. domestic income for financial reporting purposes and U.S. domestic taxable income estimated using equation (3):

$$\text{SPREAD} = \text{U.S. domestic income} - \text{U.S. domestic taxable income} \quad (4)$$

where our estimate of U.S. taxable income was defined in equation (3).¹⁵

A more precise estimate of the book-tax spread can be calculated by reducing U.S. domestic income for financial reporting purposes by expenses that are deductible in determining federal taxable income and by income that is not taxable. Specifically, we subtract from U.S. domestic income the following items when available: current state income taxes, other income taxes, and equity in income of non-consolidated subsidiaries. We subtract from U.S. domestic income current state and other income taxes because each is deductible in determining taxable income for federal tax purposes. We also remove equity in the income of non-consolidated subsidiaries

¹⁴Estimates of the magnitude of stock options' effects on income can be found in Sullivan (2000b) and Hanlon and Shevlin (2000). Hanlon and Shevlin provide a detailed description of the accounting treatment of stock options and document the extent to which estimates of taxes and tax rates will be affected.

¹⁵Our sample was reduced due to the elimination of firms that did not delineate domestic and foreign income. An alternative to this treatment is to assume that firms that do not separate out the two types of income are wholly domestic. Doing so does not qualitatively change the results reported later, however the coefficients are more difficult to interpret as it is unlikely these firms are wholly domestic.

because this income is not included in taxable income. Specifically, when firms' use the equity method to account for investments in non-consolidated subsidiaries, they increase reported income by their proportionate interest in the income of the subsidiary. However, no taxable income is recognized unless a dividend is paid, and even then the taxable income is reduced in a manner consistent with the inter-corporate dividend exclusion provision. The adjusted spread measure is therefore:

$$\begin{aligned} \text{AdjSPREAD} = & \text{SPREAD} - \text{Income Taxes (State)} - \text{Income Taxes (Other)} \\ & - \text{Equity in Net Loss (Earnings)} \end{aligned} \quad (5)$$

3. Limitations of the SPREAD measure

We focus on the measure of the book-tax spread because commentators have suggested financial reporting income has increased relative to taxable income and that this increase is indicative of an increase in tax shelter activity. As noted, the accuracy of our estimate of taxable income may be limited by consolidation practices and the accounting associated with operating loss carryforward. Moreover, our measure of the book tax spread will not reflect the magnitude of non-qualified stock compensation, since it is excluded from our estimates of both book and taxable income. Another potential source of error in the book-tax spread measure relates to repatriation of income from foreign sources when the Foreign Tax Credit (FTC) limit is not binding. Specifically, if the FTC limit is not binding, repatriation of foreign source income will trigger a current period domestic tax and increase our estimate of taxable income. However, simply repatriating foreign source income will not result in additional income recognition for financial reporting purposes. Thus, repatriation of foreign source income for firms for which the

FTC limit is not binding will decrease SPREAD.

4. Factors Likely to Affect SPREAD

We identify four types of activities (and their respective control variables) we believe are likely to affect SPREAD: a) Demand for Tax Favored Investment and Financing Actions, b) Direct Sources of Investment Related Timing Differences, c) Permanent Differences, and d) Noise Factors.

a. Demand for Tax Favored Investment and Financing Actions

i. Profitability

Profitable firms can make efficient use of tax deductions and tax credits and benefit from tax exemptions. We expect such firms to take "tax-advantaged" positions that reduce current taxable income and increase SPREAD. We control for firms' differences between profitable and non-profitable firms book tax difference by including a binary variable equal to one if the firm reports positive pretax income. We expect a positive relation between each of these variables and SPREAD.

ii. Presence of NOLs

Relative to firms that do not have NOL carryforward, firms with NOL carryforward can not make efficient use of tax deductions and tax credits or benefit as much from tax exemptions. As a result, we expect firms with NOL carryforward to eschew "tax-advantaged" positions that reduce current taxable income, resulting in a negative relation between SPREAD and the presence of NOL carryforward. That said, it should be noted one way in which firms can

generate NOL carryforward is by taking tax-advantaged positions. To the extent firms take tax advantaged positions and then, once they generate NOL carryforward, find it costly to unwind those positions, a positive relation between the presence of NOL carryforward and SPREAD will result. Separately, firms with NOL carryforward may find it less expensive to recognize additional (discretionary) income, potentially increasing the amount of income reported to shareholders while not affecting current period tax payments.

Taken together, the combined use of these two binary variables, (positive pretax income and the existence of an NOL carryforward) have been shown to be effective controls for firms' marginal tax rates. Further, the use of two binary variable, rather than the use of one, allows for the delineation of firms into four distinct categories. Firms with positive pretax income and no NOL carryforwards should have the highest marginal tax rates, and loss firms with NOL carryforwards will have the lowest.¹⁶

iii. Change in Net Sales

A key factor in accrual prediction models is change in net sales (see Jones (1991)). Specifically, we anticipate a positive relation between the rate of firm growth and SPREAD. Of importance with respect to this study, growing firms may make more significant investments in tax-favored assets that generate timing differences in the recognition of expenses for financial reporting and tax purposes. This effect may be mitigated to the extent that growing firms generate tax losses rendering tax shields from tax-favored investments less valuable. If these firms can efficiently contract with more highly taxed firms to hold assets and exploit tax shields

¹⁶This breakdown was originally suggested by Shevlin (1990) and tested on tax return data by Plesko (1999).

the relation between the rate of firm growth and SPREAD will be lessened. Consistent with this accruals literature, we measure firm growth as the change in reported net sales.

b. Direct Sources of Investment Related Timing Differences

i. Property, Plant, and Equipment

The depreciable lives of Property, Plant, and Equipment are set by statute for tax purposes. For financial reporting purposes, depreciable lives reflect management judgment. If depreciable lives for tax purposes are shorter than those used for financial reporting purposes, taxable income will be less than financial reporting income in the early years of an asset's life and higher in the later years of an asset's life. We expect SPREAD to increase with utilization of depreciable assets measured using gross property, plant and equipment. Moreover, we expect SPREAD to increase to the extent that firms use younger assets measured as the ratio of net property, plant and equipment to gross property, plant and equipment.

ii. Other Assets Subject to Systematic Write-off

Tax deductible Goodwill created subsequent to 1993 could be amortized for tax purposes over 15 years. If this goodwill were amortized over more than 15 years for financial reporting purposes, financial reporting income would be greater than taxable income in the early years of the asset's life and there would be a positive relation between SPREAD and post-1993 goodwill. Conversely, if goodwill created after 1993 were amortized over less than 15 years for financial reporting purposes, financial reporting income would be less than taxable income in the early years of the asset's life and there would be a negative relation between SPREAD and post-1993 goodwill.

As with post 1993 goodwill, non-goodwill intangible assets may be subject to different amortization periods for financial reporting and tax purposes. If financial reporting amortization is slower than amortization for tax purposes, SPREAD will be positive in the early years of the asset's life and the relation between SPREAD and non-goodwill intangible assets would be positive. Conversely, if financial reporting amortization is faster than amortization for tax purposes, SPREAD will be negative in the early years of the asset's life and the relation between SPREAD and non-goodwill intangible assets would be negative.

iii. Post-Retirement Benefits

With FAS 106, "Employer's Accounting for Post Retirement Benefits Other Than Pensions," firms were required to report obligations associated with post-retirement benefits. For tax purposes, these obligations are essentially recognized on a cash basis. Year to year, firms that increase (decrease) their post-employment obligation (i.e., report an expense for financial reporting purposes) by an amount greater (less) than the reduction in post-employment obligation by way of tax deductible expenses (i.e., report an expense for tax purposes) will report negative (positive) SPREAD. We calculate the change in post-retirement benefit obligation as the current year obligation less the prior year's obligation. We anticipate the change in post-employment obligations to be negatively related to SPREAD.

c. Permanent Differences

i. Pre-1993 Goodwill

Until 1993 the asset goodwill had to be amortized for financial reporting purposes (over a period not to exceed 40 years) but could not be amortized for tax purposes. As a result, for years

prior to 1993, the financial reporting income of firms with goodwill should have been less than their taxable income. This would result in lower measures of SPREAD and a negative relation between goodwill and SPREAD.

d. Noise Factors

i. Change in NOLs

As discussed, in years in which an NOL carryover is generated, estimated taxable income will be overstated because the current tax benefit generated will not reflect the future tax benefits from the carryover. Thus, when NOL carryforward increase SPREAD will be underestimated. We expect a negative sign on the relation between change in NOL and SPREAD.

ii. Foreign Operations

The U.S.-source versus foreign-source nature of income may differ between what is reported in published financial reports and tax reports, with this difference increasing in the level of foreign profitability. Specifically, if firms operate in foreign countries that tax corporate income at a lower rate than it is taxed in the U.S., they will have an incentive to shift taxable earnings to those foreign countries. If firms with significant foreign operations (measured using foreign source income) report more U.S. source income in their financial statements than they do in their tax reports, their measures of SPREAD will be higher than those of firms with less significant foreign operations. Conversely, if firms operate in foreign countries that tax corporate income at a higher rate than it is taxed in the U.S., they will have an incentive to shift taxable earnings to the U.S. If firms with significant foreign operations (measured using foreign source income) report less U.S. source income in their financial statements than they do in their tax reports, their measures of

SPREAD will be lower than those of firms with less significant foreign operations. Because we can not readily infer the tax shifting incentives of firms in our sample from the data sources we are using, we can not predict a sign on the relation between the extent of foreign operations and SPREAD.

iii. Size

Assets that generate temporary differences that reduce taxable income relative to financial reporting income can be viewed as tax-advantaged (Scholes et al. (2001)). Large firms may be able to more efficiently devise and execute investing plans that exploit tax-advantaged assets. However, the ability of large firms to exploit tax-planning opportunities may be limited by their perception that availing themselves of such opportunities may bring about unwanted political and regulatory scrutiny.¹⁷ These conflicting effects do not make it possible to predict a sign on the relation between the extent of foreign operations and SPREAD. We measure firm size as total assets less net property, plant and equipment and intangibles assets

iv. Lagged Spread

We expect that SPREAD may follow either a monotonic or mean reverting process. For many firms, SPREAD will be the result of tax-favored investments that hasten tax deductions. If the firm is in a steady state with positive factor price inflation, continually replenishing tax-favored investments at nominally increasing prices, SPREAD will increase year to year. Such a

¹⁷ Mills (1988) discusses the extent to which book-tax differences may play a role in the audit process of large firms. Mills, Erickson, and Maydew (1998) estimate that the return to large firms for tax planning is on the order of four dollars for each dollar invested. Phillips (1999) examines the effect of including firms' taxes paid as a factor affecting managerial compensation.

state may reasonably describe large businesses operating in fairly stable industries. If firms make investments in tax-favored assets in a non-monotonic manner (e.g., large "one-time" investments), SPREAD will reflect a spike and then revert to a normal level as the timing difference associated with the investment unwinds.

V. Descriptive results

A. Data

Data was collected from the Standard & Poor's Compustat Annual File for the years 1988 to 1999. The Compustat Annual File contains firm identifying information and more than 300 other data items from the financial statements and footnotes of more than 10,000 publicly-traded firms. Within the Compustat file, each item of information collected from the financial statements is assigned a Data Item Number, which does not change from year to year (for example, Total Assets is data item 6), allowing the easy electronic retrieval of data for a large number of corporations.¹⁸ While Compustat data is widely-used in research, data can only be obtained for the datafile if it is reported in the financial statements, and distinctions must be made between when a lack of reporting is due to the value being zero rather than missing.¹⁹

Some data fields (e.g., assets) are rarely missing, while others, particularly those from the footnotes, may rarely contain valid entries. In any given year, the number of firms with non-missing fields for all relevant variables will exceed the number of firms having the same data over two or more years. Initially, we collected data on all firms that had non-missing values for the

¹⁸See Standard & Poors (1997) for a description of the database, the data item codes, and other information related to the file.

¹⁹In some cases, Standard & Poors' may yield incorrect values or classification errors, see Kinney and Swenson (1993). The appendix describes our approach to missing values.

variables of interest in any of the sample years. From this initial sample we then imposed data requirements spanning the entire study period, substantially reducing the number of observations, but allowing us to make comparisons on the same set of firms over the entire period.

Our final sample contains 17,692 firm-year observations for which we are able to calculate SPREAD, and 12,204 firm-year observations for which we are able to calculate adjusted-SPREAD. The actual number of observations used in any particular application will be much smaller, as the explanatory variables used in the regression to explain the book-tax spread may not be available for every firm in every year. For example, in the most restrictive setting, 98 firms, representing 1,078 firm-years, had sufficient data to calculate the adjusted-SPREAD and each of the explanatory variables in each of the eleven years.

B. How Significant is the Book-Tax Spread?

While Figures 1 and 2 provide the Treasury's graphs of the book-tax spread for the largest corporations, Treasury appears to have limited its analysis to only the very largest firms - those with assets in excess of \$1 billion.²⁰ While it is reasonable to expect firms with the largest incomes to also have the largest spreads, limiting the sample may make it more difficult to make

²⁰The exact sample used by Treasury in both these graphs and the graph presented in U.S. Treasury (1999) is unclear. While Treasury states an asset requirement, it is not clear in which year that asset requirement applies, or whether a firm must meet that requirement in all years to be included. Based on Figure 1, it appears that the firms included for 1992 reported approximately \$150 billion of total receipts less total deductions. This is slightly less than one-half of the amount of total receipts less total deductions reported for all corporations with assets in excess of \$250 million in 1992, according to the 1992 Corporation Source Book (U.S Internal Revenue Service (1995)). However, the description of the sample in Figure 2 differs from that in Figure 1. In Figure 1 the sample is described as "Firms with Mean Assets Over \$1 Billion," but in Figure 2 the sample states "Firms with Assets Over \$1 Billion."

statistical inferences. Further, restrictions placed on the data to construct the sample of firms may influence the conclusion that can be reached.

In Figure 3 we plot the aggregate unadjusted book-tax spread for all firms with data to do so in each of the years. Relative to Treasury's Figure 2, three things stand out. First, while showing a different and more volatile pattern than Treasury, the overall trend is approximately the same, with the book-tax difference rising dramatically in the early 1990s. Second the dollar magnitude of the differences are smaller, with the amount of book-tax difference well below \$60 billion until 1999, in comparison to Treasury's estimate of more than \$120 billion in 1997. Third, Treasury shows a negative book-tax spread only once, in 1992. This is likely the result of firms adopting new accounting for post-retirement benefits as outlined in FAS 106. We estimate negative spreads from 1990-1993. Part of the difference in the magnitude and sign of the spread may be due to the sample, with Treasury likely to have data on more firms (even with the restriction on asset size), or firms with greater book-tax spreads. Other explanations for the difference have to do with what income is included: in our case, we focus solely on domestic income, while the M-1 data may also contain consolidated foreign source income. Further, as explained previously, our measure will exclude the effects of stock options, which are included in Treasury's measure of the book-tax spread.

The concern in basing a conclusion regarding the book-tax spread on Figure 3 is that the group of firms included in any given year may not be the same firms included in any other year. Without requiring the composition of the sample to remain constant over the sample period, changes in the value of the book-tax spread from year-to-year may be due solely to the inclusion or exclusion of particular firms.

Figure 4, displays the results of restricting the sample by requiring all firms to have data to

construct the SPREAD variable in all years, leaving a total of 365 firms. As in prior figures, the trend in SPREAD is similar to that reported by Treasury until 1997. For 1997, we estimate that SPREAD fell relative to 1996, and fell further in 1998, but dramatically increased in 1999.

Treasury data ends in 1997, so a comparison of the last two years is not possible.

Further restricting the sample to the firms in Figure 4 for which we can also calculate adjusted SPREAD reduces the panel to 190 firms, and is displayed in Figure 5. The general trend in this figure, similar to the earlier figures, is of an increase in the book-tax spread from the early 1990s through 1996 followed by a decline in 1997 and 1998, but with a sharp increase in 1999. While all of the variants of our sample show an increase in the book-tax spread during the early and mid-1990s, whether the problem is increasing or abating is still open to question, as is the question of the sources of the large book-tax differences that appear in the data, and the sources of the wide swings in the estimates of the adjusted-SPREAD.

Descriptive statistics of the variables for the most restricted sample of firms are presented in Table 2. This sample of 98 firms, representing 1,078 firm-years, has sufficient data to calculate the adjusted-SPREAD and each of the explanatory variables in each of the eleven years. We present these means for two reasons. First, we believe the adjusted-SPREAD variable is less noisy than the unadjusted SPREAD variable. Second, it is difficult to interpret the means from unbalanced samples that allow firms to enter and leave year to year.

Several things stand out in Table 2. First, as reflected in the Figures, the estimates of book-tax income differences increased from a low point in 1991 to a high in 1999. This is generally consistent with the observation that the gap between income for financial reporting purposes and tax purposes grew during the 1990s. Second, it appears that among this group of firms, 1991 was a particularly poor sales year, with the mean change in sales equal to negative \$261 million. In

fact, 1991 was the only year covered in the sample that mean sales declined, with mean year to year change over the sample period equal to positive \$250 million. In contrast, 1999, which has the largest estimated value of adjusted SPREAD also has the largest reported change in sales. Third, the change in post-retirement obligations spikes in 1992 and 1993 and then diminishes significantly in years thereafter. This is consistent with firms' adoption of FAS 106 in 1992 and 1993 and electing to take a large one-time charge against income rather than spreading the charge over an optional 20 year period.

Correlations are presented in Table 3. The majority of the relations between adjusted SPREAD and the explanatory variables are as expected. One notable exception is the positive relation between adjusted SPREAD and Pre-1993 Goodwill. As discussed, amortization of Pre-1993 Goodwill was deductible for financial reporting purposes but not for tax purposes. Thus, we expected these variables would be negatively related. While our primary focus is on the ability to predict SPREAD rather than on identifying the specific variables that generate SPREAD, it is important to note that the high degree of inter-correlations between the explanatory variables. These correlations suggest that introducing each of these variables into our regression analysis is important to avoid a correlated omitted variables bias and incorrect inferences regarding the relative explanatory power of any particular variable.

VI Explaining the Book-Tax Spread

A. Estimating the Sources of the Book-Tax Spread

To estimate the extent to which the book-tax spread can be explained by the institutional and economic factors described above, we estimated the following fixed effects model for the adjusted book-tax spread:

$$\begin{aligned}
\text{adjSPREAD} = & \beta_0 + \beta_1 * (\text{Positive Pretax Income}) + \beta_2 * (\text{Positive NOL Carryforward}) \\
& + \beta_3 * (\text{Change in Net Sales}) + \beta_4 * (\text{Gross PP\&E}) + \beta_5 * (\text{Net PP\&E} / \text{Gross PP\&E}) \\
& + \beta_6 * (\text{Change in Goodwill after 1993}) + \beta_7 * (\text{Non-Goodwill Intangible Assets}) \\
& + \beta_8 * (\text{Change in Post-Retirement Benefits}) + \beta_9 * (\text{Pre-1993 Goodwill Assets}) \\
& + \beta_{10} * (\text{Change in Unused NOL}) + \beta_{11} * (\text{Foreign Pretax Income}) \\
& + \beta_{12} * (\text{Total Assets less PP\&E and Intangibles}) + \beta_{13} * (\text{Lag Adjusted Spread}) \quad (6)
\end{aligned}$$

where the variables are as defined in the Appendix.

We pool together the successive cross-sectional data for the eleven year period and estimate equation (6) using a fixed-effects model.²¹ In a fixed-effects model, we assume that differences across the firms can be captured with firm-specific constants, but that the marginal effect of each explanatory variable is the same across all firms and over time.

B. Results

Table 4 presents the estimated coefficients of the model using data pooled across the sample period. The model is estimated twice using a balanced panel of firms to obtain estimates of the various factors on adjusted SPREAD, and again to obtain estimates from the broader sample of firms using the unadjusted SPREAD.²² As noted, adjusted SPREAD is a refined measure of

²¹See Greene (2000) or Wooldridge (2000) for a description of the fixed-effects model, and other approaches to panel data models. Wooldridge (2000) also addresses the extent of bias when including lag-dependent variables in fixed-effects models. The remaining coefficients are not statistically different when we exclude the lag adjusted spread.

²²Although not reported here, we also estimated equation (6) on the unbalanced panels of the two variables to test the robustness of the results in Table 4. Coefficient estimates were relatively stable across all of the equations. We further estimated equation 6 using ordinary least squares (OLS) on the pooled sample of 1078 firms with data to estimate adjusted SPREAD, with similar results. The adjusted R² in the pooled OLS was 0.64

SPREAD and should, as a result, be somewhat less noisy.

The reported adjusted-R²s for each of the regressions indicate that the factors included in the model explain a significant portion of the variation in SPREAD and adjusted SPREAD. The R² for the adjusted-SPREAD regression is more than twice that of the unadjusted SPREAD measure. This is consistent with our view that adjusted-SPREAD is a somewhat less noisy estimate of true SPREAD.

In Table 4, the coefficient estimates on the three variables reflecting firms' demand for tax-favored investment and financing actions are generally consistent with expectation. Specifically, the coefficients on Pretax Income and Change in Net Sales are as expected and significant at conventional levels. These results are consistent with profitable firms having a greater incentive to invest in tax-favored vehicles that tend to reduce taxable income relative to income for financial reporting purposes, and/or with revenue recognition policies more generous for financial reporting than for tax. The coefficient on the presence of an NOL carryforward is positive in both cases, but statistically significant only in the unadjusted SPREAD regression, suggesting carryforward firms have, on average, higher book-tax income spreads. This is consistent with NOL firms having taken tax-advantaged positions in the past which are costly to unwind.

The findings with respect to the two variables included to control for the effects of capital investments and their associated timing differences are mixed. The coefficients for Gross PP&E are positive and significant in each regression, consistent with PP&E generating deductions more quickly for tax purposes than for book income purposes. However, the coefficients on Net PP&E / Gross PP&E are not significant at conventional levels in either of the regressions.

The coefficients on Change in Goodwill after 1993 are negative in both regressions, but not significant. The coefficients on Non-Goodwill Intangible Assets are significant in both regressions

but switch signs: negative in the case of SPREAD, but positive in the case of adjusted-SPREAD. Note, however, that we were not able to make a sign prediction for these variables because we do not have good *a priori* evidence that the useful financial reporting lives of these assets systematically differ from those used for tax purposes.

The coefficients on Change in Postretirement Benefits are significant and negative in both regressions, consistent with these expenses being taken primarily for book purposes only.

The coefficient on Pre-1993 Goodwill is negative and significant for adjusted SPREAD, but positive and significant for SPREAD. This result should be analyzed together with the earlier one for Non-Goodwill Intangible Assets which had the opposite pattern. Recall that prior to 1993 Goodwill amortization reduced income for financial reporting purposes but was not deductible for tax purposes.

Turning to the "noise" variables, the coefficient on Change in Unused NOL is negative and significant in each regression as expected. This is consistent with our overestimating taxable income in periods when losses are incurred. This result is consistent with Mackie (2000), that at least some of the increase in book-tax differences are due to cyclical economic factors, with the recent strong economic performance allowing greater use of NOLs generated in prior periods.

The coefficients on Foreign Pretax Income are significant in both cases, but switch signs; negative for adjusted SPREAD and positive for SPREAD. The negative coefficient is consistent with firms transferring income from foreign operations to the U.S. for taxation, bypassing the tax system of the foreign country. Such behavior is consistent with the U.S. being, effectively, a tax haven. However, the change in the sign between the two regressions is not readily explainable.

The coefficients on Total Assets less PP&E and Intangibles (our size variable), though positive, are statistically insignificant in both regressions. This suggests that the size of the firm

(other than separately controlled for) is not associated with book tax differences.

The coefficients estimates for the lag adjusted SPREAD and lag SPREAD are positive and significant in both regressions, suggesting that book tax differences within firms persist over time.

VII. Conclusions

We model the spread between income for financial reporting purposes and income for tax purposes as a function of a relatively small set of variables. These variables reflect demand for tax favored investing and financing activities, specific factors that generate timing and permanent differences between financial and taxable income, and factors that may create noise in the estimation of financial and taxable income.

The evidence we report is consistent with the view that a small number of factors are responsible for a significant amount of book-tax differences. The early 1990s appears to be unusual in that the model is unable to fully capture idiosyncratic drivers of book-tax differences. The model does perform quite well in subsequent years, and it is in these years that it has been asserted that book-tax differences and tax sheltering activities have accelerated.

Beyond the narrow concerns of tax shelter activity, these book-tax accounting differences have broader implications for tax policy. If financial accounting represents a better measure of economic income than tax accounting, then differences in the two will indicate the extent to which tax rules mis-measure economic activity. Indeed, in explaining the reasons for the changes in the Alternative Minimum Tax (AMT) enacted as part of the Tax Reform Act of 1986,

Congress concluded that the minimum tax should serve one overriding objective: to ensure that no taxpayer with substantial economic income can avoid significant tax liability by using exclusions, deductions, and credits.²³

In addition to these statutory preferences, such as accelerated depreciation and tax-exempt interest, the difference in the amounts of income determined under the two accounting rules was also an explicit concern addressed in the 1986 Act:

²³U.S. Congress (1987), p. 432

With respect to corporations, Congress concluded that the goal of applying the minimum tax to all companies with substantial economic incomes cannot be accomplished solely by compiling a list of specific items to be treated as preferences. In order to achieve both real and apparent fairness, Congress concluded that there must be a reasonable certainty that, whenever a company publicly reports significant earnings, that company will pay some tax for the year.²⁴

To achieve this objective, the Book Income Preference, which included one-half of the difference between taxable and financial reporting income as a preference item, was enacted for years 1987 to 1989.²⁵

Whether the book income preference was an appropriate solution to this perceived problem is beyond the scope of this paper. The AMT did reduce the number of firms reporting positive income to shareholders yet reporting little or no income in its tax filings. However, this result may well have been accompanied by increased compliance costs, distortions in financial reporting, and a reduction in many of the incentive effects of the tax code.²⁶

There remains more research to be done into the nuances of the book-tax relation. More detailed analyses of particular industries, where both the financial and tax reporting should be more homogeneous, would be an appropriate next step, along with greater detail in the modeling of the tax and financial accounting accruals process of particular types of income and expense items, and the pattern of reversals. Such research, though common in academic circles, has

²⁴Ibid at p. 434.

²⁵The requirement for conformity between tax and financial reporting under LIFO inventory accounting is an example where the tax benefit of increased deductions required the recognition of increased expenses for financial reporting.

²⁶Both the AMT and the Book-Income Preference have been well studied. The effects of the Book Income preference on financial reporting has been addressed by Boynton et al (1992), Manzon (1992), and Wang (1994). Lyon (1997) provides an comprehensive overview of the economic effects of the corporate AMT.

generally not considered the tax reporting implications of these differences. While much narrower in scope, such research will allow for a better understanding of both the origins of these differences, and the economic circumstances that give rise to their reversal.

APPENDIX

Variable Construction

In the text we describe factors that may be responsible for book tax differences, and outline the motivation for including certain variables in our analysis. In this appendix we provide a more detailed description of the variables and their construction, complete with Compustat data items numbers in parentheses.

Unadjusted Book-Tax Spread (SPREAD) is defined in equation (4) as U.S. domestic income (272) less U.S. domestic taxable income, where U.S. domestic income is estimated as the Current Federal Tax Expense (63) divided by the statutory maximum corporate tax rate.

Adjusted Book-Tax Spread (adjSPREAD) is defined in equation (5) as SPREAD - Income Taxes, State (173) - Income Taxes, Other (211) - Equity in Net Loss (55)

Positive Pretax Income is a binary variable, taking on the value of one if pretax income (272) is positive, and zero otherwise.

Positive NOL carryforward is a binary variable equal to one if the firm reports a NOL carryforward (52) on its balance sheet. We assume that firms with missing values for item 52 have no NOL carryforwards.

Change in Net Sales is calculated as current year net sales (12) as reported on the income statement less prior year net sales.

Gross PP&E is taken from firms' balance sheets (7).

Net PP&E / Gross PP&E is the ratio of balance sheet item (8) divided by (7).

Change in Goodwill after 1993 is measured as the difference between reported goodwill (204) and the value of goodwill reported by the firm in 1993. For years 1993 and earlier this variable is equal to zero. If goodwill is reported by Compustat to be missing, we set it equal to

zero.

Non-Goodwill Intangible Assets are measured as the difference between total intangible assets (33) and goodwill (204). Missing values for Compustat item 204 are set equal to zero.

Change in Post-Retirement Benefits is measured as the difference between reported post-retirements benefits (330) and the value reported in the previous year. Compustat reports item 330 (counterintuitively) as a negative value, reflecting its nature as a liability. We multiply these values by (-1) to provide a more readily interpretable coefficient.

Pre-1993 Goodwill Assets is the amount of goodwill reported on firms' balance sheets for 1993 and earlier, and is equal to the 1993 value thereafter.

Change in Unused NOL is the change in Compustat item (52).

Foreign Pretax Income is reported in Compustat as item (273).

Total Assets less net PP&E and Intangibles is calculated as (6) - (8) - (33).

References

- Bankman, J. 1999 "The New Market in Corporate Tax Shelters" *Tax Notes* 83:12 (June 21) pp.1775-1795
- Bear Stearns, 2000, "Employee Stock Options," *Accounting Issues* (July 6).
- Boynton, C.E, P. Dobbins, and G.A. Plesko, 1992, "Earnings Management and the Corporate Alternative Minimum Tax," *Journal of Accounting Research*, v. 30, (Supplement): 131 -153.
- Callihan, D.S., 1994, "Corporate effective tax rates: A synthesis of the literature," *Journal of Accounting Literature*, 13: 1 - 43.
- Dworin, L., 1985, "On estimating corporate tax liabilities from financial statements." *Tax Notes*, (December 2): 965-971
- Greene, W.H., 2000, *Econometric Analysis*, fourth edition, (Upper Saddle River: Prentice Hall).
- Jones, J., 1991, "the Effects of Foreign Trade Regulation on Accounting Choices," *Journal of Accounting Research*, v. 29: 193 - 228.
- Kies, K. 1999 "A Critical Look at the Administration's `Corporate Tax Shelter' Proposals" *Tax Notes* 83:10 (June 7) pp.1463-1486
- Kinney, M., and E. Swanson, 1993, "The accuracy and adequacy of tax data in COMPUSTAT," *Journal of the American Taxation Association* 15: 121-135.
- Lyon, A.B., 1997, *Cracking the Code: Making Sense of the Corporate Alternative Minimum Tax*, (Washington D.C. : Brookings Institution).
- Hanlon, M., and T. Shevlin, 2000, "The Accounting Treatment of the Tax Benefits of Employee Stock Options: Implications for Financial Accounting and Tax Research," working paper, University of Washington.
- Mackie, J.B., III, 2000, "The Comeback of the Corporate Income Tax," in *Proceedings of the Ninety-Second Annual Conference on Taxation, 1999*, (Columbus: National Tax Association - Tax Institute of America), pp. 93-102..
- Manzon, G.B., 1992, "Earnings Management of Firms Subject to the Alternative Minimum Tax," *Journal of the American Tax Association*, v. 14, (Fall): 88 - 111.
- , and G.A. Plesko, 1996, "Self-disclosure and selection bias in studies of AMT-motivated behavior." Paper presented at the Financial Reporting Forum of the Annual Meeting of the American Accounting Association, Chicago, Illinois.

- Mills, L.F., 1998, "Book-tax differences and Internal Revenue Service adjustments," *Journal of Accounting Research* 36: 343 - 356.
- , M.M. Erickson, and E.L. Maydew, 1998, "Investments in tax planning" *Journal of the American Taxation Association* 20: 1 - 20.
- Omer, T.C., K.H. Molloy, and D.A. Ziebart, 1991, "Measurement of effective corporate tax rates using financial statement information," *Journal of the American Taxation Association* 13: 57 - 72.
- Palepu, K.G., P. M. Healy, and V.L. Bernard, 2000, *Business Analysis & Valuation: Using Financial Statements*, 2nd edition (Southwestern).
- Phillips, J., 1999, "Corporate Tax Planning Effectiveness: The role of Incentives," working paper, University of Connecticut.
- Plesko, G.A., 1999, "An Evaluation of Alternative Measures of Corporate Tax Rates," Working Paper, MIT.
- , 2000a, "Book-Tax Differences and the Measurement of Corporate Income," in *Proceedings of the Ninety-Second Annual Conference on Taxation, 1999* (Washington DC: National Tax Association), pp. 171 - 176.
- , 2000b, "Evidence and Theory on Corporate Tax Shelters," *Proceedings of the Ninety-Second Annual Conference on Taxation, 1999* (Washington DC: National Tax Association), pp. 367 - 371.
- Porcano, T.M., 1986, "Corporate tax rates: Progressive, proportional, or regressive," *Journal of the American Taxation Association* 7: 17-31.
- Scholes, M., M. Wolfson, M. Erickson, E. Maydew, and T. Shevlin, 2001, *Taxes and Business Strategy*, 2nd edition (Upper Saddle River: Prentice Hall).
- Shackelford, D.A. and T. Shevlin, 2000, Empirical Tax Research in Accounting, working paper, University of North Carolina.
- Shevlin, T., 1990, "Estimating corporate marginal tax rates with asymmetric tax treatment of gains and losses," *Journal of the American Taxation Association* 11: 51-67.
- Standard & Poor's, 1997, *Compustat User's Guide*, (Englewood, CO: McGraw-Hill)
- Stickney, C.P. and V.E. McGee, 1982, "Effective corporate tax rates - the effect of size, capital intensity, leverage, and other factors," *Journal of Accounting and Public Policy* 1: 125-152.
- Sullivan, M. 1999a, "Shelter Fallout? Corporate Taxes Down, Profits Up" *Tax Notes* 84:5 (Aug 2) pp.653-657

- , 1999b, "A Revenue Estimate for Corporate Tax Shelters" *Tax Notes* 85:8 (Nov 22) pp.981-983.
- , 2000, "Lobbyist's Figures Flawed, Data Indicate Corporate Shortfalls" *Tax Notes* 86:3 (Jan 17) pp.309-313
- , 2000, "Let the Good Times Roll: Options and Tax-free Profits," *Tax Notes* 87: 1185 (May 29)
- Talisman, J., 2000, "Penalty and Interest Provisions, Corporate Tax Shelters" U.S. Department of the Treasury Testimony before the Senate Committee on Finance (March 8)
- U.S. Department of the Treasury, 1999, "The Problem of Corporate Tax Shelters: Discussion, Analysis and Legislative Proposals" (Washington, D.C.: U.S. GPO).
- U.S. Department of the Treasury, 2000, "Report to The Congress on Depreciation Recovery Periods and Methods" (Washington, D.C.: U.S. GPO).
- U.S. Congress, Joint Committee on Taxation, 1984, *Study of 1983 Effective Tax Rates of Selected Large U.S. Corporations* (Washington, D.C.: U.S. GPO).
- U.S. Congress, Joint Committee on Taxation, 1987, *General Explanation of the Tax Reform Act of 1986*, JCS-10-87 (Washington, D.C.: U.S. GPO).
- U.S. Internal Revenue Service, Statistics of Income ,1995, *Source Book, 1992*, (Publication 1053) (Washington D.C.: US GPO).
- U.S. Securities and Exchange Commission, 1999, "SEC Staff Accounting Bulletin: No. 99 - Materiality" (August 12).
- Wang, S., 1994, "The Relationship Between Financial Reporting Practices and the 1986 Alternative Minimum Tax," *Accounting Review*, v. 69 (July): 495 - 506.
- Wooldridge, J.M., 2000, *Introductory Econometrics: A Modern Approach* (U.S.: South-Western).
- Zimmerman, J.L., 1983, "Taxes and firm size," *Journal of Accounting and Economics* 5: 119-149.

TABLE 1
Common Measures of Income Used in Effective Tax Rate Studies
(Including Compustat Data Item Numbers)

JCT (1983)	<p>Pretax book income minus (equity income (loss) from unconsolidated subsidiaries and income (loss) from extraordinary and discontinued operations) plus income (loss) from minority interests.</p> <p>(18+16+49) - 55)</p>
Porcano (1986)	<p>Pretax book income minus equity income (loss) from unconsolidated subsidiaries plus income (loss) from minority interests.</p> <p>(18+63+49+((-1.0* 48)-55))</p>
Zimmerman (1983)	<p>Operating cash flow</p> <p>(12 - 41)</p>
Shevlin (1987)	<p>Pretax income minus (change in deferred tax liability / statutory marginal tax rate)</p> <p>(18 +16 +49 - (change in 74/0.34))</p>
Stickney and McGee (1981)	<p>Pretax book income minus (deferred tax expense / statutory marginal tax rate)</p> <p>(18 + 16 + 49 - (50/.34))</p>

All definitions are drawn from Omer et al. (1991, p. 60)

Table 2
Means of Sample Variables: Adjusted Spread
(Dollars in Millions)
98 observations per year, 1078 total firm-year observations

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Adjusted Spread	-27.88 (197.36)	-38.44 (221.57)	-92.43 (473.88)	-13.34674 (176.81)	-39.90 (263.46)	3.50 (217.27)	12.16 (314.34)	37.41 (435.25)	5.70 (389.64)	17.14 (440.01)	114.76 (920.11)
Positive Pretax Income	0.87 (0.34)	0.86 (0.35)	0.79 (0.41)	0.79 (0.41)	0.73 (0.44)	0.83 (0.38)	0.82 (0.39)	0.81 (0.40)	0.83 (0.38)	0.76 (0.43)	0.82 (0.39)
Positive NOL	0.24 (0.43)	0.26 (0.44)	0.29 (0.45)	0.30 (0.46)	0.24 (0.43)	0.24 (0.43)	0.26 (0.44)	0.24 (0.43)	0.26 (0.44)	0.28 (0.45)	0.29 (0.45)
Change in Net Sales	162.57 (597.51)	228.21 (1003.33)	-261.03 (1619.84)	296.76 (1722.48)	173.40 (1186.41)	458.61 (2567.99)	319.14 (1020.90)	374.23 (1635.16)	330.78 (1211.61)	57.44 (2382.51)	613.50 (2849.42)
Gross PP&E	1688.54 (5883.73)	1886.66 (6682.89)	1981.34 (6926.72)	2034.46 (6995.93)	2100.10 (7138.09)	2242.29 (7820.11)	2424.03 (8706.41)	2542.74 (9199.35)	2679.66 (9525.54)	2839.35 (9898.23)	3006.81 (10699.80)
Net PP&E/Gross PP&E	0.55 (0.15)	0.55 (0.14)	0.53 (0.14)	0.52 (0.14)	0.51 (0.15)	0.50 (0.15)	0.49 (0.14)	0.50 (0.15)	0.49 (0.15)	0.50 (0.15)	0.49 (0.15)
Change in Goodwill	- -	- -	- -	- -	- -	10.19 (47.10)	27.86 (150.23)	6.11 (122.87)	33.99 (273.46)	40.04 (418.03)	153.84 (543.52)
Non-Goodwill Intangible	26.69 (117.77)	24.72 (156.42)	9.13 (65.50)	12.75 (118.81)	-45.67 (565.73)	-47.20 (587.65)	-32.81 (569.32)	-5.14 (585.99)	-14.72 (505.59)	7.31 (333.93)	47.62 (205.08)
Change in Post-	- -	- -	3.45 (21.24)	22.61 (95.90)	17.38 (77.68)	1.06 (7.02)	0.30 (3.26)	-2.50 (25.48)	0.14 (2.83)	2.99 (65.61)	-1.37 (11.71)
Pre-1993 Goodwill	73.99 (537.05)	120.74 (689.10)	125.08 (685.55)	120.03 (637.12)	124.37 (616.74)	124.37 (616.74)	124.37 (616.74)	124.37 (616.74)	124.37 (616.74)	124.37 (616.74)	124.37 (616.74)
Change in Unused NOL	-3.14 (31.99)	2.85 (16.72)	0.71 (17.74)	7.40 (57.42)	3.22 (41.06)	1.92 (50.75)	2.20 (27.00)	1.71 (27.42)	-4.44 (74.04)	7.66 (51.43)	4.68 (47.78)
Foreign Pretax Income	121.60 (559.77)	56.63 (189.97)	25.68 (161.27)	11.88 (185.48)	21.97 (106.88)	72.90 (239.50)	82.56 (224.18)	68.56 (160.93)	119.44 (391.41)	86.16 (211.14)	87.77 (204.78)
Total Assets less PP&E	2440.76 (14191.92)	2584.74 (14931.86)	2655.83 (15112.22)	2809.76 (15877.69)	3106.89 (18381.43)	3404.53 (20091.08)	3683.89 (22020.88)	4017.43 (23859.73)	4319.34 (25474.56)	4006.97 (21112.00)	4518.63 (23900.82)

Table 3
Pearson Correlation Coefficients
(values below coefficient represent the significance levels)

	Adjusted Spread	Positive Pretax Income	Positive NOL Carryforward	Change in Net Sales	Gross PP&E	Net PP&E/Gross PP&E	Change in Goodwill After 1993	Non-Goodwill Intangible Assets	Change in Post-Retirement	Pre-1993 Goodwill	Change in Unused NOL	Foreign Pretax Income	Total Assets less PP&E and
Adjusted Spread	1.00 -23900.8												
Positive Pretax Income	0.09 (0.00)	1.00											
Positive NOL	-0.01 (0.62)	-0.28 (0.00)	1.00										
Change in Net Sales	0.36 (0.00)	0.09 (0.00)	-0.07 (0.03)	1.00									
Gross PP&E	0.26 (0.00)	0.06 (0.04)	-0.03 (0.27)	0.46 (0.00)	1.00								
Net PP&E/Gross	0.04 (0.22)	0.05 (0.10)	-0.06 (0.04)	0.06 (0.05)	0.04 (0.14)	1.00							
Change in Goodwill 1993	0.14 (0.00)	0.03 (0.32)	0.01 (0.82)	0.38 (0.00)	0.05 (0.10)	0.05 (0.09)	1.00						
Non-Goodwill Assets	-0.38 (0.00)	-0.02 (0.46)	0.01 (0.83)	-0.32 (0.00)	-0.39 (0.00)	0.00 (0.98)	0.09 (0.00)	1.00					
Change in Post-	-0.06 (0.04)	-0.07 (0.02)	0.01 (0.87)	0.05 (0.13)	0.08 (0.01)	0.00 (0.90)	0.02 (0.42)	0.01 (0.68)	1.00				
Pre-1993 Goodwill	0.32 (0.00)	0.03 (0.24)	-0.08 (0.00)	0.42 (0.00)	0.77 (0.00)	0.04 (0.15)	-0.03 (0.33)	-0.50 (0.00)	0.00 (0.89)	1.00			
Change in Unused	-0.09 (0.00)	-0.05 (0.08)	0.12 (0.00)	0.01 (0.74)	0.03 (0.41)	0.01 (0.86)	0.02 (0.56)	0.00 (0.96)	0.17 (0.00)	0.00 (0.88)	1.00		
Foreign Pretax Income	0.04 (0.14)	0.08 (0.01)	-0.01 (0.67)	0.30 (0.00)	0.62 (0.00)	0.01 (0.79)	0.01 (0.76)	-0.20 (0.00)	0.07 (0.02)	0.30 (0.00)	-0.09 (0.00)	1.00	
Total Assets less PP&E Intangibles	0.45 (0.00)	0.05 (0.10)	-0.07 (0.01)	0.47 (0.00)	0.79 (0.00)	0.03 (0.26)	-0.03 (0.26)	-0.63 (0.00)	0.00 (0.94)	0.92 (0.00)	0.00 (0.97)	0.45 (0.00)	1.00

TABLE 4
Fixed Effects Estimates of Factors Affecting the Book-Tax Spread
(Standard Errors in Parentheses)

	Expected Sign	(1) adjSPREAD	(2) SPREAD
Positive Pretax Income	+	61.315** (25.237)	185.081*** (24.933)
Positive NOL Carryforward	?	38.039 (24.413)	58.569** (22.887)
Change in Net Sales	+	0.058*** (0.005)	0.062*** (0.005)
Gross PP&E	+	0.150*** (0.007)	0.042*** (0.004)
Net PPE/Gross PPE	+	-2.858 (97.799)	104.994 (89.864)
Change in Goodwill after 1993	?	-0.002 (0.034)	-0.001 (0.009)
Non-Goodwill Intangible Assets	?	0.111*** (0.027)	-0.106*** (0.010)
Change in Postretirement Benefits	-	-0.560*** (0.151)	-0.188*** (0.032)
Pre-1993 Goodwill	-	-1.180*** (0.084)	0.338*** (0.063)
Change in Unused NOL	-	-0.893*** (0.153)	-0.292*** (0.079)
Foreign Pretax Income	?	-0.422*** (0.038)	0.150*** (0.025)
Total Assets less PP&E and Intangibles	?	-0.003 (0.004)	-0.000 (0.001)
Lag adjSPREAD	?	0.302*** (0.037)	
Lag SPREAD	?		0.284*** (0.017)
Constant		-257.765*** (54.498)	-427.719*** (51.577)
Observations		1078	3982
Number of firms		98	362
Adjusted R-squared		0.69	0.28

* significant at 10%; ** significant at 5%; *** significant at 1%

Figure 1.
Book and Tax Corporate Income
Firms with Mean Assets Over \$1 Billion



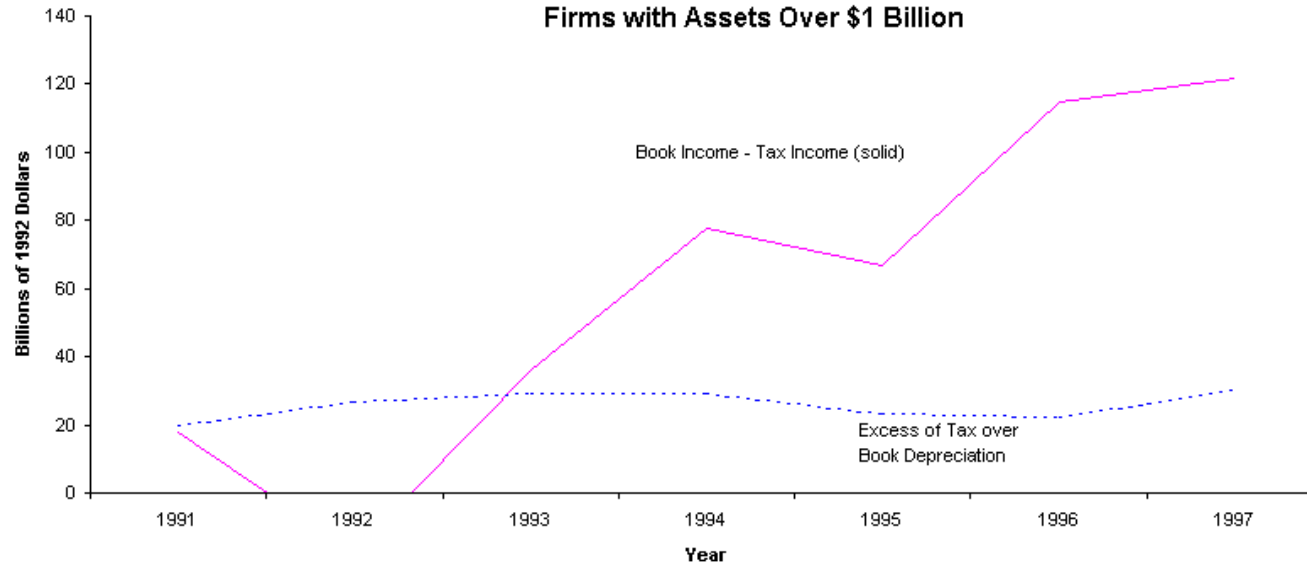
Book Income = After-tax book income from Schedule M-1 + Federal taxes - tax exempt interest

Tax Income = Total Receipts - Total Deductions

Corporations excluding S corporations, RICs, REITs, and Foreign Corporations

Source: Internal Revenue Service, Statistics of Income

Figure 2.
The Difference Between Book and Tax Corporate Income
Firms with Assets Over \$1 Billion



Book Income = After-tax book income from Schedule M-1 + Federal taxes - tax exempt interest

Tax Income = Total Receipts - Total Deductions

Corporations excluding S corporations, RICs, REITs, and Foreign Corporations

Source: Internal Revenue Service, Statistics of Income

Figure 3
Aggregate Unadjusted Book-Tax Spread - Unbalanced Panel of Firms
(in \$millions)



Figure 4
Aggregate Unadjusted Book tax SPREAD - Balanced Panel of 365 Firms
(in \$millions)

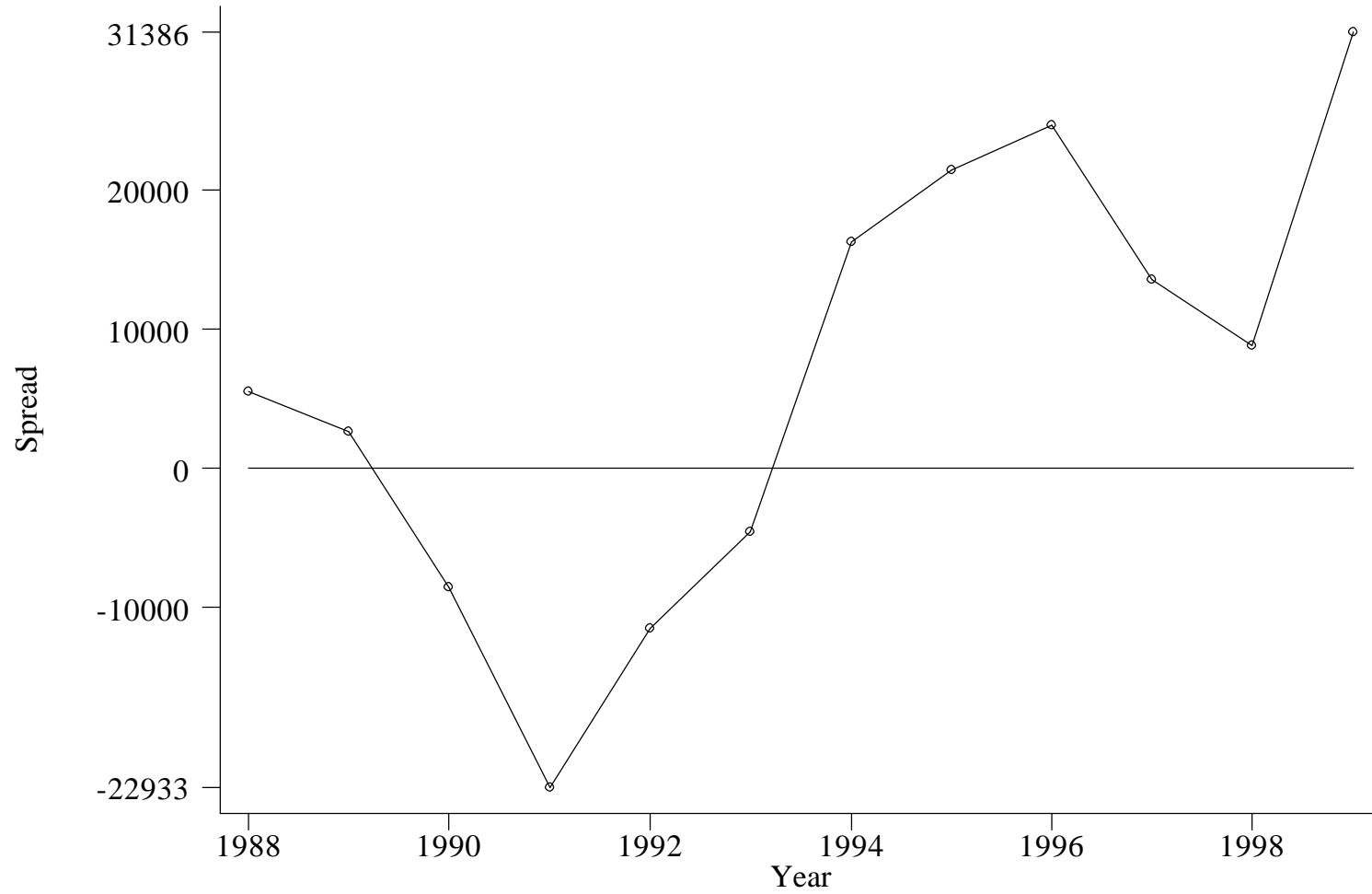


Figure 5
Aggregate Adjusted Book Tax Spread - Balanced Panel of 98 Firms
(in \$millions)

