The Corporate Profit Base, Tax Sheltering Activity, and the Changing Nature of Employee Compensation

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ABSTRACT

This paper examines the evolution of the corporate profit base and the relationship between book income and tax income for U.S. corporations over last two decades. The paper demonstrates that this relationship has broken down over the 1990s and has broken down in a manner that is consistent with increased sheltering activity. The paper traces the growing discrepancy between book and tax income associated with differential treatments of depreciation, the reporting of foreign source income, and, in particular, the changing nature of employee compensation. For the largest public companies, proceeds from option exercises equaled 27% of operating cash flow from 1996 to 2000 and these deductions appear to be fully utilized thereby creating the largest distinction between book and tax income. While the differential treatment of these items has historically accounted fully for the discrepancy between book and tax income, the paper demonstrates that book and tax income have diverged markedly for reasons not associated with these items during the late 1990s. In 1998, more than half of the difference between tax and book income – approximately $154.4 billion or 33.7% of tax income – cannot be accounted for by these factors. This paper proceeds to develop and test a model of costly sheltering and demonstrates that the breakdown in the relationship between tax and book income is consistent with increasing levels of sheltering during the late 1990s. These tests also explore an alternative explanation of these results – coincident increased levels of earnings management – and finds that the nature of the breakdown between book and tax income cannot be fully explained by this alternative explanation.

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1.   *Introduction*

Recent trends in the corporate profit base and the tax revenues it generates have drawn considerable attention. In particular, the gap between book income and tax income has reportedly widened over the last decade and corporate tax receipts have been lower than expected. These trends, against the backdrop of a protracted economic expansion over the 1990s, have generated considerable concern over the proliferation of tax sheltering activity by corporations. These concerns have been further amplified by anecdotal evidence on the proliferation of these schemes and high-profile cases associated with large corporations. Estimates of tax sheltering activity have ranged widely depending on the source and methodology employed in generating those estimates.[1]

While sheltering activity has historically been associated with individuals, the focus on corporate tax shelters raises several new questions related to the integrity of the corporate tax base. In particular, financial innovations that reduce the costs of, and widen the scope for, recharacterizing income may lead to difficulties in maintaining the corporate tax base. Similarly, the increased importance of legitimate foreign operations for U.S. firms, the attendant transfer pricing opportunities afforded by such operations, and increased competition by jurisdictions for those investments may increase the scope for income shifting. In short, American firms are faced with enhanced opportunities for avoiding or evading corporate taxes through cheaper, more sophisticated, and less transparent mechanisms.

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[1] The concerns regarding the scope and increased incidence of tax shelters can be found in a variety of sources including Bankman (1999), Sullivan (1999a, 1999b, 2000a) and U.S. Treasury (1999). Talisman (1999) and Kies (1999a, 1999b, 1999c, and 2000) provide alternative interpretations of these trends. For a perspective on the variety of instruments associated with sheltering activity, see U.S. Treasury (1999).

These questions and concerns over the viability of the corporate tax base and the scope of sheltering activity have given rise to varied legislative proposals but limited empirical analysis of the claims associated with increased sheltering activity. Additionally, evidence on sheltering activity that comes from reported book and tax income raises the issue of other differences that might arise between book and tax income and their growing incidence or magnitude. As such, empirical explorations of the nature of sheltering activity must jointly investigate the changing nature of book and tax income in order to identify any underlying trends in the gaps that separate them.[2]

This paper attempts to illuminate recent trends in the corporate profit base in order to highlight the possible aggregate scope of sheltering activity, the other determinants of gaps between book and tax income and their scope for explaining recent trends, and the dynamics of the relationship between tax and book income over the last decade. The evidence provided in the paper demonstrates that the link between book and tax income has broken down over the last decade for two reasons. First, the identifiable factors that have traditionally been associated with the distinction between book and tax income have grown tremendously. In addition to the growing relevance of overseas operations and different measures of depreciation, the paper explores the proliferation of ESOs and quantifies their impact on the corporate profit base. From 1996 to 2000, net proceeds from the exercise of ESOs for the largest U.S. corporations approximated 27 percent of

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[2] The difficulties in precisely isolating these activities should not be understated. After surveying varied and conflicting estimates of the nature of sheltering activity, JCT (2000) states (p. 16) that "the Joint Committee staff believes that direct measurement of corporate tax shelter activity through macroeconomic data is not possible. Instead, a more instructive approach may be to analyze specific tax shelter transactions that have come to light and evaluate their effect on corporate receipts." While not disagreeing with this approach, this paper attempts to at least uncover evidence of the underlying trend in sheltering activity and some evidence of the overall scope at the macroeconomic level in order to inform the debate.

operating cash flows. These net proceeds appear to be utilized nearly fully as deductions against pretax income for the corporations studied.

Second, the breakdown between tax and book income is not limited to the growth of these traditional distinctions between tax and book income. While the distinctive treatment of these items has historically accounted fully for the difference between book and tax income, the paper demonstrates that book and tax income have diverged markedly for reasons not associated with these items during the late 1990s. In 1998, more than half of the difference between tax and book income – approximately $154.4 billion or 33.7% of tax income – cannot be accounted for by these historically relevant measures of the discrepancy between tax and book income.

In order to identify the reasons for this breakdown, the paper develops a model of sheltering and then tests that model by exploring the dynamic of the link between tax income and book income over time and by levels of tax income. The estimates motivated by this model of sheltering provide evidence that the patterns of the deteriorating link between tax and book income are consistent with increased levels of sheltering over the decade. One important alternative hypothesis – that the breakdown of the link between tax income and book income reflects coincident increased levels of earnings management – is also investigated. Measures traditionally associated with different levels of, or motives for, earnings management do not appear to fully explain the distinctive nature of the breakdown of the link between tax and book income in the latter part of the decade. Taken together, the evidence suggests that the large unexplained gaps between tax and book income that have arisen during the late 1990s are at least partly associated with increased sheltering activity.

Section 2 reviews alternative methodologies for understanding the dynamics of corporate profits and their relative merits and recent findings. Section 3 examines the changing relationship between tax and book income as viewed through the lens of aggregated data generated from tax forms where firms reconcile tax and book income. Section 4 reviews in detail the changing nature of employee compensation and its impact on the corporate profit base by exploiting several different sources of data on option exercises. Section 5 of the paper develops a model of sheltering activity and then tests that model through analyses of book and tax income generated from accounting statements over the 1990s with special attention paid to the alternative explanation of earnings management. Section 6 is the conclusion.

2.   *Previous work and review of alternative methodologies*

Efforts to understand the dynamics of corporate profits and tax revenues typically rely on three distinct sources – economy-wide aggregate data taken from national income accounts, reported taxable and book income from tax forms, and reported book income and simulated tax income from accounting statements. Each of these sources has distinct advantages and disadvantages in understanding the scope of sheltering activity and, unsurprisingly, yields distinct conclusions. These distinct sources and methodologies also yield the scope for much confusion about their conflicting implications.

National income accounts provide the most aggregate picture of corporate profitability and allow for a disentangling of the different reasons why average tax rates depart from statutory rates. By implementing the procedure proposed in Auerbach and Poterba (1987), Mackie (2000) provides this perspective on recent corporate profitability

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and the implications for recent tax collections. He documents a reduced average tax rate amid rising corporate profitability and traces through several rationales for this phenomenon. Mackie concludes that this aggregate perspective is unable to illuminate the nature of tax sheltering activity as the basic income measure employed prevents any corresponding measure of what income would have been in the absence of sheltering activity. In other words, typical shelters reduce both income and taxes leaving average tax rates unaffected.[3]

In order to understand the scope of sheltering activity, the joint reporting of book income and tax income affords the promise of measuring activity reported to shareholders but not reported to tax authorities. Indeed, much of the recent concern over tax shelters reflects the use of Treasury data to construct comparisons between tax income and book income as reported in schedule M-1. The joint reporting of book income and tax income by firms in their tax forms affords the possibility to analyze the gap between the two notions of income and the varied determinants of that gap. The reconciliation between book and tax income in schedule M-1 is, however, of limited detail and, consequently, parsing out alternative explanations of the gap is difficult. Finally, the use of the micro-data is limited given accessibility and the confidentiality requirements imposed by the IRS. Nonetheless, the aggregate perspective afforded by this reporting along with the ability to analyze true tax income, as opposed to simulated tax income, makes this a valuable source.

Accounting statements can also be used to generate comparisons between book income and simulated tax income. In particular, there is an extensive literature gauging the

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[3] For a related effort, see Petrick (2001) for a comparison on NIPA profits with S&P 500 profits and a discussion of the compositional reasons why these measures may differ.

reliability of alternative estimates of tax income generated from accounting statements by explicitly comparing them to IRS data on tax income.[4] These studies then typically go on to study book-tax income differences as generated by the accounting statements to study the nature of permanent and temporary differences in tax accounting. These estimates of book and simulated tax income can also be employed to infer something about sheltering activity as in Manzon and Plesko (2001). Manzon and Plesko (2001) study the gap between accounting-based definitions of tax income and book income and demonstrate that a few measures approximating the demand for tax shelters help explain the cross-sectional variation in these gaps.[5]

As noted by Hanlon and Shevlin (2001), the estimates of book and tax income generated by accounting statements do not encompass the same differences as those generated by viewing differences between book and tax income as reported on tax forms. In particular, deductions associated with the exercise of stock options will not be represented in the gap between book and tax income generated from accounting statements but will show up in the gap generated using tax forms.[6] In addition to this distinction in reporting of deductions associated with option exercises, any analysis of book income must address potential managerial motives to manage earnings. A large literature has evolved that tries to define, document, and understand the motivation behind earnings

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[4] See Plesko (1999, 2000) and Mills and Newberry (2000) for a discussion of these alternative measures and their relative merits.

[5] Manzon and Plesko (2001) relate the absolute magnitude of the gap to possible determinants of demand for sheltering activity. They find that dummy variables associated with presence of pretax profits and NOLs help predict the size of the gap in a cross-sectional regression.

[6] This difference results from the departure from "clean surplus" accounting in the accounting of stock options. In short, tax benefits from exercise of ESOs do not flow through the income statement but are simply transferred to additional paid-in-capital. As a consequence, tax expenses from accounting statements won't allow for consideration of the deductions associated with exercises. The reporting of these tax benefits associated with employee exercises is continuing to evolve and Hanlon and Shevlin (2001) argue that varied

management.[7] While the magnitude and impact of such behavior remains in question, it is conceivable that trends in earnings management could result in systematic variation in book and tax income.

The analysis that follows attempts to use the IRS and accounting sources of tax and book income to illuminate the problem of tax shelters. The aggregate view as represented by IRS data is analyzed in section 3 in tandem with an exploration of the impact of ESOs in section 4. The disaggregated view generated by accounting statements is analyzed in section 5 by developing a model of sheltering and then testing it. This analysis also discusses the possibility that earnings management might result in similar empirical patterns and tries to distinguish sheltering activity from earnings management.

3.   *Tax Income, Simulated Book Income and Actual Book Income*

Concerns over increased sheltering activities by corporations are typically associated with trends in corporate tax receipts and trends in the gap between tax income and book income employing figures extracted from tax returns. Figure 1a considers the ratio of federal corporate tax receipts to all federal on-budget tax receipts from 1971 to 2001 as reported in OMB (2002). The figure depicts the overall decline in that ratio from nearly 19.7% in 1977 to 10.2% in 2001. Much of the pattern in this ratio for the intervening years can be explained by large legislative changes and general economic conditions. The recent decline, beginning in 1996, is more puzzling given the coincident

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estimates of tax rates make the mistake of inferring tax rates without consideration for the effects of these tax benefits.

[7] See Dechow and Skinner (2000), Healy and Wahlen (1999) and Schipper (1989) for review articles of this large literature.

economic expansion. In particular, this ratio falls from 15.8% in 1996 to 13.5% in 2000 and then, even more dramatically, to 10.2% in 2001.

The relationship between tax and book income as reported in schedule M-1 demonstrates a similarly curious trend. These figures have been employed by the Treasury Department to emphasize the increased incidence and magnitude of corporate tax shelter activity. Figure 1b reproduces a figure from Talisman (1999) that is also related to the figure employed in the Treasury Department's study of corporate tax shelters (U.S. Treasury, 1999). This graph employs data for only those corporations with assets greater than $1 billion. Inferring a multiple of book income over tax income from that picture illustrates the concern that tax shelter activity has increased over that period. In particular, the ratio of book income to tax income grows to 1.4 from 1.0 over five years. Alternatively, book income exceeds tax income by approximately $120 billion (in 1992 dollars) by 1996. This figure, and the gap it highlights, has served as the most important source of data for the debate on corporate tax shelters. Unfortunately, as pointed out by Kies (1999a), there are a number of alternative explanations for this gap that make such a picture inconclusive.

In order to understand the implication of this widening gap for the scope of tax sheltering activity, it is useful to construct a measure of simulated book income that incorporates identifiable sources of that gap. In particular, discrepancies between tax and book income may be attributable to causes unrelated to tax sheltering activity. The evidence in Table 1 and Figure 2 considers the dynamics of tax and book income for firms that have assets greater than $250 million and isolates the impact stemming from three potential sources of that gap: the differential treatment of depreciation expense on tax and

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book forms, reinvested earnings abroad, and deductions associated with the exercise of non-qualified stock options. Before analyzing the data, the distinctions between the two sets of data should be emphasized. Figure 1 employs actual tax return data to analyze the gap between actual tax and book income for corporations that have more than $1 billion in assets and are not S-corporations, RICs, or REITs from 1991 to 1996. In contrast, Table 1 and Figure 2 initially simulate that gap for similar corporations but with a cutoff of $250 million in assets over the period from 1982 to 2000.

Table 1 provides data, in current dollars, for simulating book income for these corporations and begins with an estimate of tax income comparable to the base in the Talisman picture. In order to analyze the impact of the discrepancy between depreciation expense allowed for tax purposes and that associated with book accounting, Table 1 draws on BEA estimates of the capital consumption allowance (CCA) adjustment which measures the discrepancy between tax measures of depreciation and economic depreciation. This aggregate measure of the discrepancy is scaled by that fraction of depreciation expenses associated with firms over $250 million in assets. To the degree that economic depreciation is not representative of depreciation associated with historic cost-accounting, and to the degree that this link between accounting and economic depreciation has become more tenuous over time given the changing nature of assets, the evidence in Table 1 likely understates the impact associated with gaps between tax and accounting notions of depreciation. Similarly, Table 1 captures the discrepancy between income earned by U.S. corporations operating abroad and that income which is repatriated from

BEA data on capital flows.[8] Finally, Table 1 provides data from Execucomp on the

aggregate level of option exercises by employees that is discussed in greater detail below.

These data are only available subsequent to 1992. Tax income from 1999 and 2000 is not

yet available but is presumed to stay at 1998 levels in order to facilitate a baseline

comparison for 1999 and 2000.

Figure 2 relates the findings of Table 1 in a format comparable to the evidence

provided in Figure 1 by translating the figures from Table 1 into 1992 dollars and graphing

them. The bottom line in Figure 2 presents tax income and each line above it adds on an

identifiable source of the difference between tax and book income so that the uppermost

line represents simulated book income. The evidence provided in Figure 2 indicates

several important features of the changing nature of the relationship between book and tax

income. First, while gaps between tax and book income were associated with differing

notions of depreciation during the 1980s, the role of depreciation differences is now

considerably smaller. Nonetheless, recent years feature a renewed distinction between tax

and economic notions of depreciation that maps to the tax and book income gap. Second,

reinvested earnings abroad, which may reflect both increased foreign activity as well as

changed repatriation patterns, are growing in importance and are contributing significantly

toward a larger gap. Finally, differing treatment of exercises of ESOs now provides the

largest component of the growing gap between tax and simulated book income. By 1998,

these three sources comprise 20.4% of tax income. The divergence of simulated book and

tax income through the last decade appears to be growing particularly rapidly near the end

of the decade. While precisely comparable ratios are not yet available for 1999 and 2000

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[8] These figures are scaled by the annual fraction of FTCs attributable to firms with assets more than $250

as tax income is not available, it is clear that these discrepancies – particularly option exercises and reinvested earnings abroad – have grown even more rapidly after 1998.

While this comparison between tax and simulated book income suggests that these two series have become increasingly distinct during the 1990s for identifiable reasons, it is even more striking how *actual* book income relates to reported tax income and simulated book income. Figure 2 plots actual book income from 1987 to 1998 for this same set of firms with dots.[9] From 1987 to 1993, actual book income tracks simulated book income remarkably well with the exception of 1992 when actual book income dips below both simulated book income and tax income. Beginning in 1994, however, actual book income begins to diverge from both tax income and simulated book income in a rapid fashion. This divergence is most acute in 1998 when tax income falls by 9.0%, simulated book income falls by 5.5%, and actual book income does not decline. By 1998, this divergence results in actual book income being 1.63 times tax income and 1.26 times simulated book income. Indeed, in 1998, more than half of the difference between tax and actual book income – approximately $154.4 billion or 33.7% of tax income – cannot be accounted for by these sources of the distinction between tax and book income.

This breakdown between both actual book income and tax income and between actual book income and simulated book income can have several alternative explanations. First, the identified sources of differences between tax and book income that have been estimated – particularly the scope of option exercises – could be understated in Figure 2 and Table 1 and these sources could account for an even larger fraction of the difference

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between tax and actual book income. The following section investigates the actual scope of option exercises in more detail to consider this possibility. Second, alternative discrepancies between book and tax income such as the proliferation of hybrid instruments that provide for deductions to tax income but not book income or the differential treatment of pension earnings could account for some fraction of the gap. Aggregate estimates of such activity suggest that these sources are not likely to be large enough to comprise significant fractions of the unexplained difference between book and tax income.[10]

Third, earnings management, either through the intertemporal shifting of income or through fraudulent book reporting could be associated with this gap. This possibility is investigated further in section 5 but it is worth noting the distinction in the beliefs of practitioners and researchers on the scope of earnings management. In particular, Dechow and Skinner (2000) note "while practitioners and regulators seem to believe that earnings management is both pervasive and problematic, academic research has not demonstrated that earnings management has a large effect on average on reported earnings, or that whatever earnings management does exist should concern investors." Finally, in contrast to an earnings management explanation that emphasizes the inflation of book earnings, this

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[9] This series was provided by the IRS. Figures for 1989 are only available for all firms so the amounts associated with filers with more than $250 million in assets is interpolated from similar ratios for 1988 and 1990.

[10] For example, Engel, Erickson and Maydew (1999) study a sample of all trust preferred stock issued between 1993 and 1996 that amounts to $36 billion of issuances. Given that only the periodic payments of these instruments would be associated with the gap between book and tax income, it seems unlikely that such debt-equity hybrid instruments can account for meaningful fractions of the unexplained difference. As reported widely in the press, Adams (2001) reports that for 30% of S&P 500 companies, pension earnings comprise an average of 12% of pretax income in 2000. Such a figure, if true for *all* companies, would begin to account for a more significant portion of the gap. For example, in 1998, such a ratio could account for 57% of the unexplained difference. Given that firms that report such a figure, and on which such an average ratio is based, are biased toward having material amounts to report and that many firms do not have defined benefit plans which give rise to these differences, such an extrapolation provides an extreme upper bound on the potential for pension accounting to contribute to this difference.

gap could reflect the artificial underreporting of tax income relative to book income. This

hypothesis is investigated through the model developed in section 5.

4.   *Changing Trends in Employee Compensation and the Corporate Tax Base*

The large and growing importance of option exercises as a reason that the corporate

tax base is shrinking is further explored in Tables 2, 3, 4 and Appendix Table 1. While

various studies have considered the incentive and behaviorial consequences of options as a

form of compensation, [11] few have considered the consequences associated with the

proliferation of option instruments for the corporate tax base. [12] Tax-related studies (eg.

Hall and Liebman (2000) and Goolsbee (2000a, 2000b)) have emphasized the behavior of

top executives rather than the impact of these changed compensation instruments on the

corporate profit base.

Table 2 provides an overview of option granting and exercise behavior for nearly

2,000 firms from 1992 to 2000 from the Execucomp database. [13] The data provided

through Execucomp is limited to the granting and exercise behavior of the top five

executives given that mandatory reporting centers on their behavior. However, it is

possible to extrapolate to all-employee grants and exercises as firms are required to report

the share of total grants that correspond to the grants to the top five executives. While this

process is straightforward for grants (as the share for the top five is based on grants), the

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[11] See Murphy (1999) for an overview or Core and Guay (2001) and Huddart and Lang (1996) for a detailed study of exercise behavior.
[12] Sullivan (2000), Bear Stearns (2000) and McIntyre (2000) are exceptions – each considers a subsample of up to forty firms in an effort to gauge the overall impact of option exercises on the corporate tax base.
[13] The Execucomp database contains information on various types of compensation for top executives in companies including options granted and exercised to each executive and the percentage these represent of all options granted and exercised, respectively, by all employees each company each year. These data are presented by executive and company, with up to five records (one for each executive) for each company for

extrapolation is somewhat more complicated for exercises requiring some additional assumptions.[14]

Table 2 provides evidence of several trends in the impact of option granting and exercise behavior on the corporate profit base. First, the remarkable rise in aggregate grants and exercises by the top five officers of these firms over the period has resulted in grant values of over $16 billion in 2000 to just the top five officers. This corresponds to a tenfold increase over the decade. Second, option granting behavior appears to be deepening within firms at a rapid pace as the share represented by the top five has decreased steadily from 29% in 1994 to 24% in 2000. Finally, the aggregate levels of grant values and exercises across all employees across all firms mushroomed to over $100 billion, in the case of annual exercises, in 2000 which corresponds to a sixfold increase over the decade. The deepening of the use of incentive instruments in organizations, the absolute magnitudes of the amounts involved, and the proliferation of repricing strategies suggests that the proliferation of options will likely survive a market downturn.[15]

Given the extrapolation involved in Table 2, it is useful to undertake a more detailed analysis of the largest 150 firms (by market value of equity) in order to ascertain

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each year. From these individual executive/company/year records, it is possible to calculate aggregate grants and exercises for the top five executives.

[14] Exercises for all employees were calculated by grossing up the exercises of the top five executives in a year by the average ratio of grants to the top five over grants to all employees for the sample period. If this average proved particularly low, this estimate was recalculated using ratio of 20% to prevent any spurious overstatement of aggregate exercise levels. Implicit in this calculation is the assumption that all employees behave similarly in their exercise behavior. Core and Guay (2001) and Huddart and Lang (1996) compare the behavior or top executives and employees more generally and find both are sensitive to recent price performance. Given the additional reporting requirements of the top five, it is likely that employees are more opportunistic than top five executives.

[15] Such a conclusion is necessarily speculative but the evidence on repricings in Brenner, Sundaram and Yermack (2000) and recent high-publicity events surrounding CEO compensation suggest that levels of compensation are being adjusted on other margins to accommodate the levels of compensation recently enjoyed by CEOs.

the reliability of these estimates and the degree to which they correspond to actual tax benefits.[16] Table 3 summarizes the evidence provided in Appendix Table 1 on the behavior of these firms and yields more precise, and comparable, estimates of the impact of the proliferation of options on the corporate tax base.[17] Using hand-collected data on the exercise of options, $78 billion was realized as proceeds from option exercises for just the top 150 firms in 2000. This figure corresponds to a mean ratio of proceeds from option exercises to operating cash flow of 29%. Table 3 highlights the growing absolute magnitude of the exercises and the growing ratio of those exercises to measures of corporate profitability during the late 1990s. The detail in Appendix Table 1 demonstrates that the use of options is proliferating through firms of all types and are not limited to high-technology or "new economy" companies. For a variety of traditional consumer goods and financial services firms, option net proceeds appear to comprise greater than 10% of operating cash flow or net income.

The proceeds from option exercises might not translate into tax deductions at the firm level for a variety of reasons. In particular, loss-making firms, firms employing incentive stock options, or firms employing variable-priced options may not realize comparable tax benefits as indicated by their net proceeds from options exercises. Table 4 takes the 30 firms with the largest ratio of option exercises to operating cash flow from Appendix Table 1 and details their reporting of the tax benefits associated with option

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[16] Selecting on market value may create some biases. First, by selecting on market value, these firms are likely to have the some of the largest five-year returns. As such, the potential for realized gains might be the largest in this group. At the same time, this group excludes a variety of smaller capitalization stocks that would have recently gone public and are most likely to have used ESOs heavily during their earlier years. Finally, the market value ranking was taken as of early November and, consequently, does not include a variety of firms that experienced rapid gains and subsequent losses during the period from 1996 to 2000 which may have experienced large proceeds from stock option realizations.

exercises.[18] As described in Hanlon and Shevlin (2001), the incipient reporting of these

tax benefits need not reflect the actual tax benefits realized by firms. Nonetheless, 18 of

the 30 firms (this propensity to report tax benefit figures corresponds to the figures

reported in Hanlon and Shevlin for Nasdaq firms) with the largest ratios of option

exercises to operating cash flow report tax benefits associated with the exercises.

Unsurprisingly, there is considerable heterogeneity with some firms - for example

Ebay - reporting limited, if any, tax benefits from the deductions associated with the

exercise of stock options. Nonetheless, for all these firms reporting tax benefits, the

average ratio of tax benefits to estimated net proceeds from option exercises is 32% across

the three years suggesting that the option exercise figures correspond to tax deductions that

are being close to fully employed.[19] Taken together, Tables 2, 3, and 4 suggest that the

proliferation of option instruments to compensate employees has had a significant role in

creating a large and growing gap between tax and book income and in changing the

corporate profit base. Additionally, the more detailed study of the largest firms suggests

that the estimates from Execucomp for the overall corporate universe are reliable estimates

for the aggregate levels of the impact of option exercises on the corporate tax base.

5.   *Testing a Model of Costly Sheltering with Accounting Data*

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[17] A more detailed discussion of the methodology employed in constructing Appendix Table 1 is provided in the Data Appendix.

[18] The tax benefits from employee exercises of stock options were collected for 1998 through 2000 by examining both the statement of cash flows and the statement of shareholders' equity in the consolidated financial statements reported in the 10-K (or other documents if incorporated by reference).

[19] Given that reporting of the tax benefits does not appear to be standardized nor, as demonstrated by Hanlon and Shevlin (2001), to be necessarily correlated with the tax deductions actually taken by firms, it is not clear that there is any sample bias by selecting on those firms with the largest ratios.

In order to isolate the degree to which the growing gap between tax and book income is associated with increased sheltering activity, this section begins with a discussion of the use of firm-level accounting data to isolate book and tax income. In this subsection, special attention is paid to an alternative explanation for the emerging book-tax income gap – increasingly aggressive earnings management. In order to motivate specific empirical tests of sheltering, a model of costly sheltering is then developed and implemented with these accounting-based measures of book and tax income.

5.1   *The Use of Accounting Data to Compare Book and Tax Income*

While Figures 1 and 2 consider the gap between tax income and book income as generated by data from tax forms, an alternative methodology that employs accounting data can be used to generate a related notion of what the gap between tax and book income is. As noted previously, the gap generated by this methodology has an important difference from the gap generated using data from tax forms: the accounting of stock option activity removes this deduction from both tax income and book income. As such the gap between estimates of tax and book income generated from accounting data is unlikely to be associated with stock option activity but could be associated with depreciation discrepancies or the reporting of foreign source income as well as sheltering activity. The use of accounting data also holds out the possibility of using micro data more readily than what is available from aggregates based on tax forms.

Inferring tax income from accounting reported book income involves a variety of alternative measures of tax expense. Current and deferred tax expenses are jointly considered in order to capture permanent and temporary differences between tax and

accounting reporting of income. Plesko (1999) reviews the varied alternative methods for calculating tax expenses and their correlations with actual tax income.[20] The analysis that follows employs the measure of tax liability associated with Stickney and McGee (1981).[21] Use of the measures argued for by Porcano (1986), Zimmerman (1983), and Shevlin (1987) do not yield dissimilar results in the regression results that follow.

Figure 3 reports calculated tax and book income, generated from accounting statements, in 1992 dollars for a large universe of public companies that comprise an unbalanced panel from 1982 to 2000. For this large sample, there appears to be three distinct phases of the relationship between book and tax income. First, until the Tax Reform Act of 1986, book income far exceeded tax income. Second, from TRA through the early 1990's, differences between book and tax income became considerably smaller. Finally, from the early 1990s book income has begun to diverge in a consistent manner from tax income. This gap reassuringly mirrors the gap between book and tax income presented in Figure 1.

While deductions associated with the net proceeds from stock option exercises are not likely to be part of that gap, it is possible that changed patterns of depreciation differences and reinvested earnings abroad might contribute to this gap. Applying the same figures from Table 1 to the gap in Figure 3 demonstrates that there still appears to be a considerable gap between actual aggregate book income and simulated book income for much of the 1990s. Given that the adjustments associated with depreciation differences and reinvested earnings abroad are for *all* firms with assets greater than $250 million, the

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[20] See also Callihan (1994), Kinney and Swanson (1993), and Omer etal. (1991) for further discussion of the varied methodologies in using Compustat data and the relative merits of alternative measures.

gap between book income and calculated tax income would be even larger during the 1990s as the evidence in Figure 3 is only for 6,000 firms. This gap appears to persist in a balanced panel from 1982 to 2000 of 500+ firms and for an unbalanced panel from 1992 to 2000 for which there exists detailed compensation data as presented in Appendix Figures 1a and 1b.

The gap between tax and book income could be associated with a secular increase in managerial efforts to boost book income through earnings management rather than a secular increase in efforts to depress tax income. As discussed above, researchers have struggled to find aggregate evidence of a meaningful, sustained role for earnings management. Nonetheless, it is useful to consider the motives and evidence related to earnings management so that empirical tests can attempt to discriminate between these two explanations. Theories of earnings management typically try to explain management of earnings through smoothing whereby managers intertemporally shift income to accomplish a variety of objectives. Managers may smooth earnings in order to signal firm quality (Barnea etal. (1975)), to influence future shareholders and long-run share prices (Dye (1988) and Goel and Thakor (2001)), to derive incumbency rents (Fudenberg and Tirole (1995)), or to lower borrowing costs due to reduced perceived probabilities of financial distress (Trueman and Titman (1988)). For smoothing to explain the gaps depicted in Figure 2 would require a massive, sustained borrowing from future earnings during the 1990s. Moreover, earnings smoothing explanations of Figure 2 would requires that the period during which earnings have been mortgaged has yet to occur. Given that most of these models correspond to quarterly, and possibly annual, smoothing of income, it is hard

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[21] This involves total tax expense with an adjustment for deferred tax expenses.

to imagine the managerial motives that could correspond to long-run acceleration of income as would be required for earnings smoothing to explain the gaps in Figure 2.

Empirical efforts to isolate earnings management typically employ one of three methods that provide some instruction for the empirical tests that follow. First, earnings management and smoothing can be detected by looking for evidence of discretionary accrual accounting. In particular, Jones (1991) develops a model of discretionary accruals that attempts to isolate firms or industries with large amounts of discretion in accrual methods. Studies tend to emphasize those industries with particularly large opportunities for discretionary accruals such as provided in banking with provisions for loan loss reserves in searching for evidence of earnings management. Second, Burgstahler and Dichev (1997) and Degeorge etal (1998) try to detect earnings management by examining the distribution of earnings around threshold levels such as analyst expected earnings. Finally, the underlying economics of specific accounts can be modeled, such as valuation allowances for deferred tax assets as in Miller and Skinner (1998), and then actual accrual behavior can be compared with predicted levels to isolate discretionary accruals. The most convincing evidence of earnings management comes from studies of distributions of earnings around threshold levels while other efforts reach contradictory conclusions regarding increased levels of earnings management and the overall relevance of earnings management. The industry-specificity of discretionary accruals and the objective of smoothing earnings relative to thresholds suggest that industry fixed-effects as well as sorting firms by relative levels of the variability of book income relative to tax income might usefully distinguish earnings management explanations from tax sheltering activities.

5.2   A model of corporate tax shelter activity

In order to motivate the empirical tests of increased sheltering, it is useful to specify a model of costly sheltering. Let I equal true economic income, B equal reported book income and T equal reported tax income. Book income is presumed to correspond to true economic income with noise so that:

(1) $B = Ie^u$ where $u \sim N\left(0, \sigma^2\right)$

In order to specify what tax income would be, let s equal sheltered income which is associated with costs $\gamma(s)$ which are characterized by $\gamma'(s) > 0$ and $\gamma''(s) > 0$. In this setting, costs of sheltering only correspond to the amount of income sheltered and not the amount of true economic income. In other words, larger firms have no advantage in sheltering income relative to smaller firms. As a consequence, tax income is given by:

(2) $T = I - s - \gamma(s)$

and the tax rate is a function of this taxable income as represented by $\tau\left(I - s - \gamma(s)\right)$.

Firms choose the amount of income to shelter by solving:

(3) $\max_s \left[I - s - \gamma(s)\right]\left(1 - \tau\left(I - s - \gamma(s)\right)\right) + s$

which yields the first-order condition:

(4) $-\left(1 + \gamma'(s)\right)\left(1 - \tau(\cdot)\right) + \left[I - s - \gamma(s)\right]\left(1 + \gamma'(s)\right)\tau'(\cdot) + 1 = 0$.

To analyze this problem further, it is useful to consider two regions of the tax schedule where there is progressivity and where there is no progressivity. At sufficiently high levels of income, then the tax rate will exhibit no progressivity, $\tau'(\cdot)=0$, and then (4) will collapse to:

$$(5) \qquad \left(1+\gamma'(s)\right)\left(1-\tau(\cdot)\right)=1$$

At such levels of income, levels of sheltering will no longer vary with levels of income, as $\frac{ds}{dI}=0$. As a consequence, it is possible to rewrite the level of tax income in (2) as:

$$(6) \qquad T = I - s - \gamma(s) = I - \bar{k}$$

Taking logarithms of both sides of (6) and (1) and employing a first-order Taylor approximation, it is possible to rewrite (1) as:

$$(7) \qquad ln(B) = ln(I) + \frac{k}{I} + u$$

which in turn becomes the estimating equation in the empirical analysis that follows.

When levels of income are such that $\tau'(\cdot)\neq 0$, the first order condition in (4) can be rewritten as an expression for tax income,

$$(8) \qquad T = \left[I - s - \gamma(s)\right] = \frac{(1-\tau)-\dfrac{1}{\left(1+\gamma'(s)\right)}}{\tau'(\cdot)}.$$

In order to make this tractable, it is useful to transform this into:

(9) $\quad F(T) = \dfrac{-1}{1+\gamma'(s)}$ where $F(x) = \left[\tau'(\cdot)x + \tau(\cdot) - 1\right]$

and to define the inverse function as $G(z) \equiv F^{-1}(z)$. This specification allows tax income

to be rewritten as:

(10) $\quad T = G\left(\dfrac{-1}{1+\gamma'(s)}\right)$

Given that the curvature of $G(\cdot)$ will be small when the curvature of $F(\cdot)$ is high, it

becomes clear that at low levels of income, $\dfrac{dT}{dI} \cong 0$.[22] With respect to the estimating

equation provided in (7), this model suggests that the relationship between book income

and tax income will be distinctive at low levels of tax income necessitating a piecewise

linear model to estimate (7). More specifically, the model suggests that sheltering will be

reflected by a relatively flatter relationship between book and tax income at low levels of

tax income. Correspondingly, increased levels of sheltering will be reflected in a flattening

of the relationship between tax and book income.

The intuition behind this result comes from the nature of the costs of sheltering in

the model. It is useful to imagine a world without sheltering initially. In such a world,

estimation of (7) would result in a forty-five degree line that mapped tax income to book

income and that passed through the origin. The impact of sheltering in altering the shape

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[22] More precisely, this requires the additional assumption that $\tau''(\cdot) = 0$ and that $\gamma''(\cdot) \ll \tau'(\cdot)$ as

$$\dfrac{dT}{dI} = 1 - \dfrac{2\tau'(\cdot)\left(1+\gamma'(s)\right)^3}{\gamma''(s) + 2\tau'(\cdot)\left(1+\gamma'(s)\right)^3}$$

of that line will be a function of the nature of the costs of sheltering. In particular, costs of sheltering in this model are associated with the amounts sheltered and not the levels of true income conferring no advantage on those firms with large amounts of true economic income. As a consequence, all firms shelter in a manner to avoid the same amount of tax. If there were no progressivity in the tax schedule, then estimation of (7) would still result in a forty-five degree line but would intersect the y-axis at some non-zero level of book income reflecting the fact that all firms shelter some income to avoid a given amount of taxes. Progressivity in the tax schedule, however, will result in a flattening of the relationship between book income and tax income at low levels of tax income because more income can be sheltered given the lower tax rates and the constant amount of tax liabilities being avoided. In turn, increased levels of sheltering will be associated with a flattening of the relationship between book and tax income at low levels of tax income.[23]

Alternative specifications of the costs of sheltering would result in distinctive patterns in the relationship between tax and book income. For example if costs of sheltering were a function the fraction of true income sheltered, thereby suggesting that firms with large amounts of income find it easier to shelter more income, then increased sheltering would be associated with the initial forty-five degree line taking on a parabolic shape. The specification employed above and tested below has the advantage of being consistent with taxing authorities that maximize revenue collection and the notion that

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[23] While it is possible to recast the problem of costly sheltering as a problem of costly earnings management, a model of earnings management where inflating book income was costly would not generate the curvature at low levels of tax income as it arises from the progressivity of the tax schedule. If zero earnings was a particularly important threshold level and the costs of earnings management were a function of such a threshold, it is possible to arrive at a theoretical model of earnings management that delivers corresponding empirical predictions.

firms of different sizes face the same probability of detection when sheltering a given amount of income.

5.3   *Testing the model of sheltering*

As indicated above, increasing levels of sheltering should be evident through a changed relationship between book and tax income at low levels of tax income. The analysis in Table 5 and Figures 4a and 4b employs a piece-wise linear regression framework for relating the logarithm of book income to the logarithm of tax income and traces that relationship through the decade. This approach has the advantage of tracing the changing relationship of tax income to book income over the decade and testing for whether the disconnect between book and tax income has become most pronounced for reporters with small amounts of tax income.

In Table 5, observations are aggregated into three distinct buckets in order to isolate the trends in the relationship between book income and tax income. The specification employing data from 1992 to 1994 demonstrates that coefficients become larger and more statistically significant as tax income becomes larger. The more interesting pattern is the comparison across time periods. First, coefficients on the splines at low levels of tax income become considerably smaller dropping from 0.61 and 0.69 in 1992-1994 to 0.22 and 0.60 in 1998-2000, respectively. Additionally, the significance of these estimates drops and the overall degree to which tax income predicts book income is reduced. Finally, the decreased levels of coefficients are not nearly as pronounced at higher levels of tax income.

Given the industry-specificity of discretionary accrual opportunities, it is useful to employ industry fixed effects in these piecewise linear regressions in an effort to isolate a sheltering explanation for this phenomena from an earnings management explanation. The results presented in Table 5 with the inclusion of industry fixed effects demonstrate that within-industry variation provides even stronger results for a weakening of the relationship between book and tax income at low levels of tax income. The coefficients from the three specifications employing industry fixed effects are used to construct the lines in Figure 4a. This figure provides the flattening of the relationship between book and tax income as predicted in the model of costly sheltering over the course of the 1990s.

This same exercise is repeated by year in Table 6 and Figure 4b. Industry fixed-effects are again employed in an effort to parse out earnings management explanations from tax sheltering explanations. The regressions presented in Table 6 are consistent with the results from the grouped years. While the coefficients on the first spline are positive and significant in early years of the sample, the coefficients on the first spline are close to zero by 2000. These coefficients are insignificant in later years but correspond to a significantly reduced link between book and tax income at low levels of tax income. Finally, the R-squareds of the regressions decline generally over the sample period suggesting further the reduced link between book and tax income. Figure 4b provides a graphical representation of these annual results and illustrates the changing nature of the relationship between tax and book income over the course of the decade.

This regression evidence is difficult to reconcile with alternative rationales for the disparity between tax and book income. For example, if the differential measurement of depreciation or of reinvested earning abroad were to wholly account for this changed

pattern, this differential measurement would have to have become more concentrated amongst low tax income firms during the 1990s. While these possibilities appear unlikely, it is possible that the accounting of option exercises, if firms follow clean surplus accounting, would have reduced tax income, as measured by accounting statements, for young growth firms with low tax income. Controlling separately for the levels of option activity in these regressions demonstrates that option activity cannot explain this decoupling of book and tax income at low levels of tax income. In order to ensure that results are not being disproportionately the different behavior of small or large firms, Appendix Table 2 and Appendix Figures 1a and 1b attempt the same piecewise linear regressions provided in Table 5 by dividing the sample at the median level of sales. The same patterns appear to hold.

In addition to using industry fixed effects to separate out earnings management explanations from tax sheltering explanations, it is possible to consider the relative variability of book and tax income in an effort segregate active earnings managers from non earnings managers.[24] In order to do so, ratios of the standard deviations of book income to tax income are calculated for all the firms in the sample and firms. This ratio has a median of 0.91 and firms with a ratio below the median are considered earnings-smoothing firms and firms with a ratio above the median are considered non-smoothers. If earning management were a primary driver of the breakdown of the relationship between book and tax income at low levels of tax income, then firms with different propensities to smooth book income should exhibit a different relationship between tax and book income

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[24] Such a distinction resembles other studies that attempt to isolate earnings smoothers by the relative absence of variability in reported earnings as in Myers and Skinner (2001) who study firms with consistent increases in reported earnings.

at low levels of tax income over the course of the decade. The evidence provided in Table 7 and Figures 5a and 5b suggest otherwise as both earnings-smoothers and non-earnings smoothers exhibit similar underlying trends over the course of the decade with respect to a flattening of the book-tax income relationship at low levels of tax income.

The simple regression framework explored in Tables 6 and 7 and Figures 4 and 5 provides evidence that is consistent the model of sheltering provided in section 5.2. The implications of these results is that sheltering became considerably less costly, either through lowered probabilities of detection or perceived lower penalties, and that firms became more aggressive during the 1990s. The alternative explanation of a secular increase in earnings management is difficult to reconcile with the data provided in the paper. First, earnings management theories typically do not allow for such long-run intertemporal shifting of income as would be required to explain the aggregate trends in Figure 2. Second, if earnings management opportunities are particularly associated with discretionary accrual opportunities in some industries, then within industry variation should have reduced, rather than increased, evidence of this underlying behavior in the micro evidence. Finally, if increased earnings management were the cause of the flattening of the relationship between book and tax income at low levels of tax income, simple distinctions in the relative variability of book and tax income should have demonstrated more pronounced differences in this breakdown. While it is not possible to definitively rule out earnings management as a source of some of the aggregate phenomena observed in Figure 2, this micro analysis suggests that the distinctive way in which the relationship between book and tax income has deteriorated over the decade is consistent with increased levels of costly sheltering.

6.   *Conclusion*

This paper attempts to illuminate the debate on tax sheltering by disentangling varied explanations for the relationship between tax and book income over the last decade. First, the paper demonstrates that estimates of tax income and book income generated from tax returns are increasingly becoming disconnected for two reasons – the growing importance of identifiable factors that distinguish these factors and an increasing unexplained residual. Second, the paper demonstrates that changed patterns in employee compensation are transforming the corporate profit base and contributing significantly to aggregate differences between tax and book income.

Finally, the paper demonstrates that the relationship between tax and book income, as measured by accounting statements, has similarly broken down. The evidence in the piecewise linear regressions suggests that this breakdown has been particularly pronounced at low levels of tax income and has degenerated over the decade. These results are consistent with the model of costly sheltering presented in the paper and decreased costs of sheltering over the decade leading to greater gaps between tax and book income. Simple tests to check if these results are driven by increased levels of earnings smoothing do not appear to diminish the results that suggest that increased sheltering is responsible for the distinctive breakdown in the relationship between book and tax income.

The large discrepancy reported between simulated and actual book income from Figure 2 along with the regression evidence suggests that efforts by firms to circumvent tax payments are becoming more significant, cheaper to implement, and harder to detect. These developments provide yet another reason to reevaluate the manner in which

corporate earnings are taxed as the underlying developments driving these phenomena –

including increased access to global opportunities and the rapid development of financial

innovations – are unlikely to decline in importance in the near future.

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Figure 1a: Corporate Tax Receipts as Percent of Total On-Budget Receipts, 1971-2001
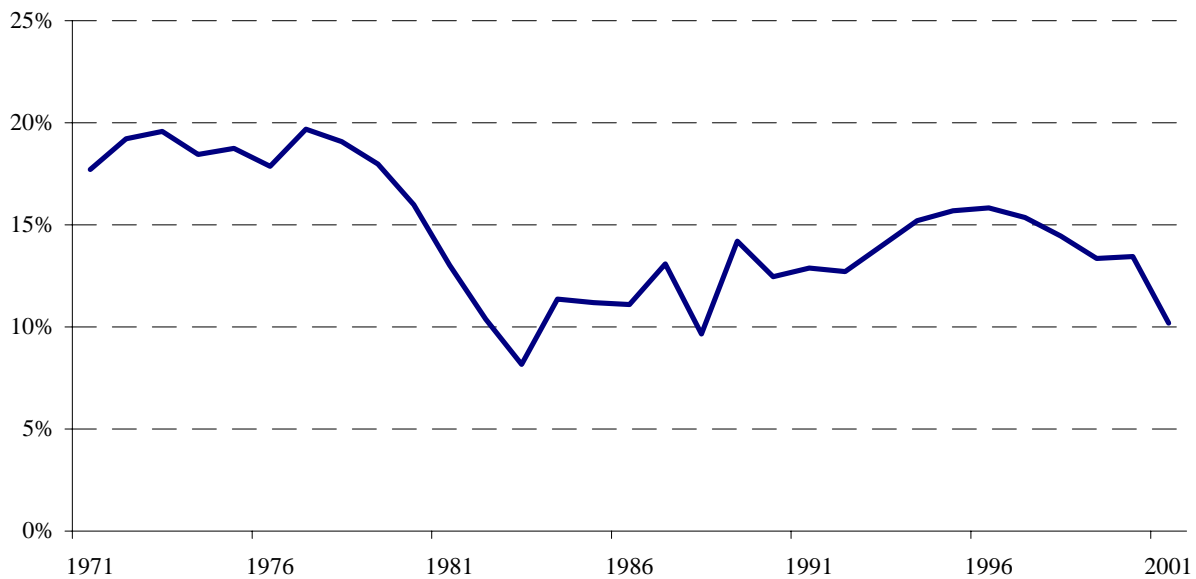
Figure 1b: Actual Book and Tax Income, Firms with greater than $1 Billion in Assets, 1991-1996
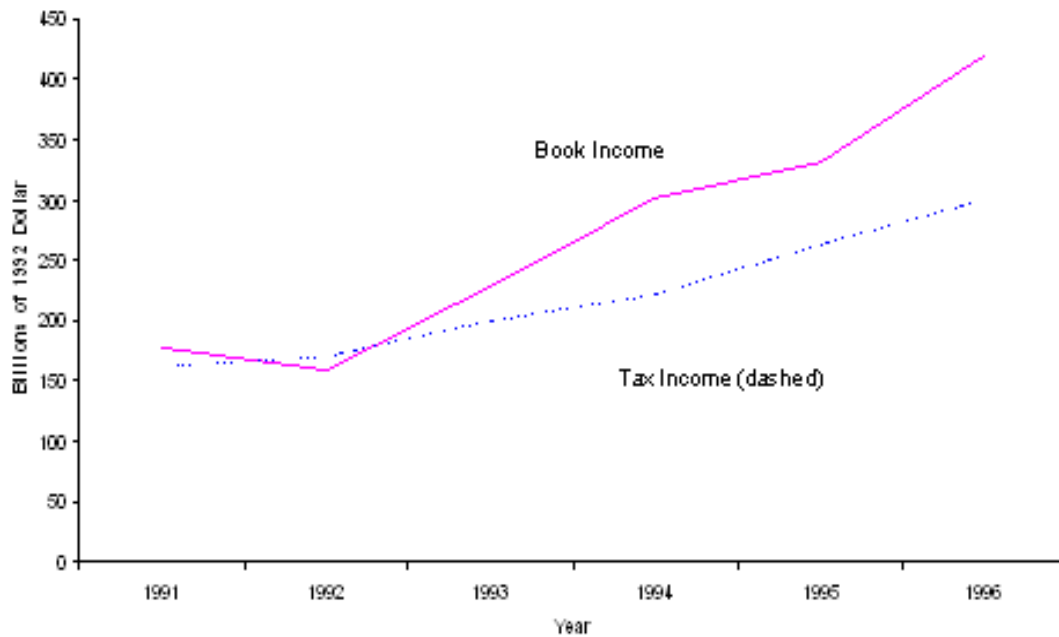
	1991	1992	1993	1994	1995	1996
Inferred Multiple of Book over Tax Income	1.13x	0.94x	1.15x	1.39x	1.26x	1.40x
Inferred Excess of Book over Tax Income	20.0	(10.0)	30.0	85.0	70.0	120.0

Note: Figure 1a is the ratio of corporate tax receipts to all on-budget federal receipts as reported in OMB (2002). Figure 1b is extracted from Talisman (1999). Book Income corresponds to after-tax book income from Schedule M-1 plus federal taxes less tax-exempt interest. Tax Income is the difference between total receipts and total deductions. This is based on all corporations with assets greater than $1 billion and excludes S Corporations, RICs, REITs and foreign corporations.

Figure 2
Tax, Simulated Book and Actual Book Income for Firms with greater than $250 Million in Assets, 1982-2000

Legend:
(1) Tax Income
(2) Excess Depreciation + (1)
(3) Reinvested Earnings Abroad + (2)
(4) Option Exercises + (3)
(5) Simulated Book Income = (4)
(6) Actual Book Income
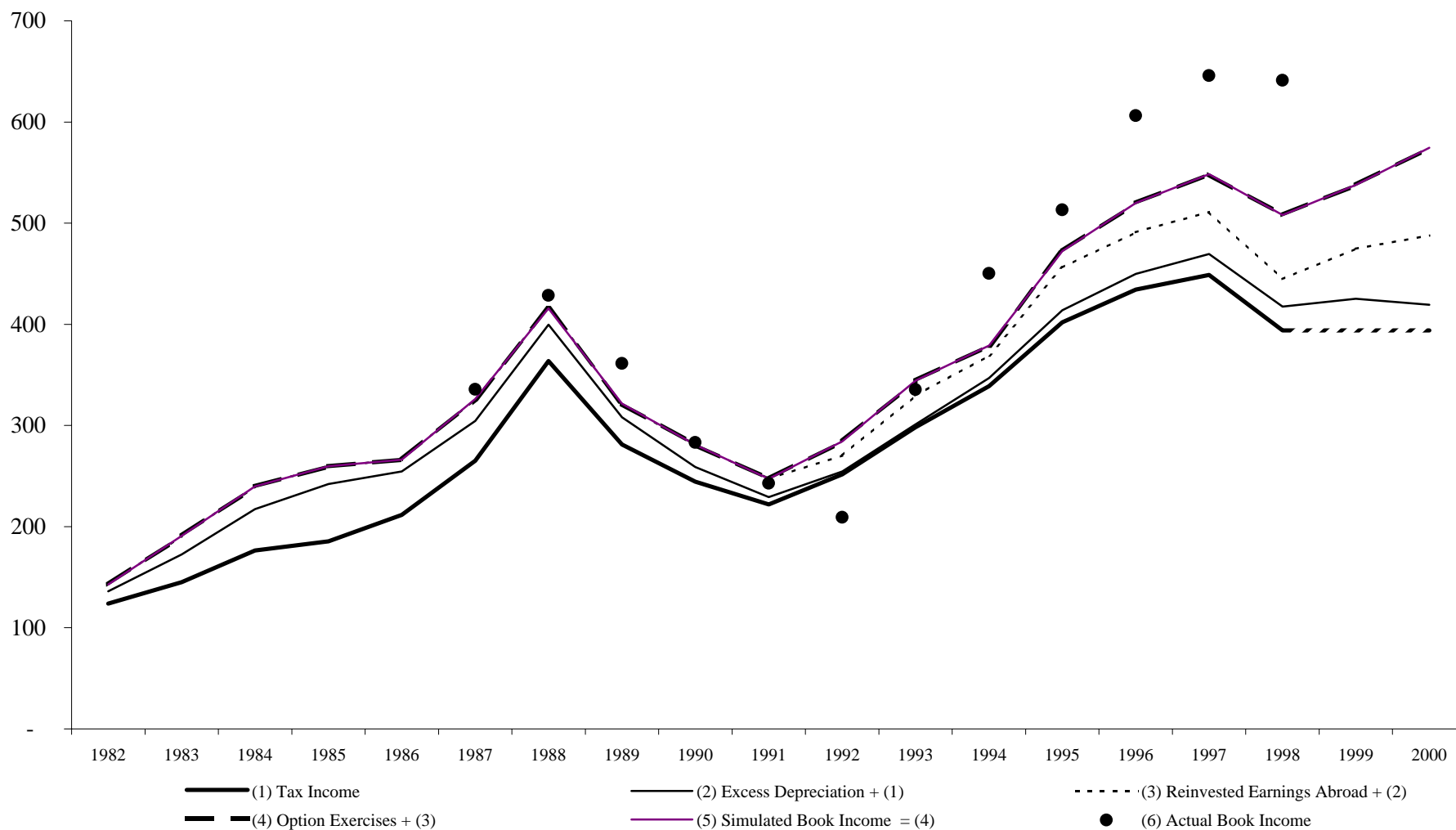
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Actual BI / Actual TI	1.27x	1.18x	*1.28x*	1.16x	1.09x	0.83x	1.12x	1.33x	1.28x	1.40x	1.44x	1.63x
Actual BI - Actual TI	70	65	*80*	39	21	(42)	37	111	111	172	197	247
Actual BI / Simulated BI	1.03x	1.03x	*1.12x*	1.01x	0.98x	0.74x	0.97x	1.19x	1.09x	1.17x	1.18x	1.26x
Actual BI - Simulated BI	9	13	*40*	2	(5)	(75)	(9)	71	41	86	97	133

Note: Tax income corresponds to total receipts less total deductions for filers with more than $250 million in assets excluding RICs REITs and S-Corporations. Excess depreciation corresponds to the difference in tax and economic depreciation as outlined in CCA adjustments. Reinvested earnings abroad is the difference between earnings abroad and repatriated earnings as reported by the BEA. Option exercises are estimated from Execucomp data and are only available from 1992 onward. Simulated book income is the sum of those items. Black dots correspond to actual book income for those same companies and represents after-tax book income from Schedule M-1 plus federal taxes less tax-exempt interest. Figures are in 1992 dollars. For 1989, IRS data is available only for all filers. The greater than $250 million category is interpolated by assuming the ratio for this category relative to all filers is the average of thos ratios in 1988 and 1990. The bottom four rows compare actual book income to actual tax income and actual book income to simulated book income.

Figure 3
Calculated Book and Taxable Income for All Public Companies, 1982-2000

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
	5,181	5,259	5,337	5,537	5,673	5,646	5,488	5,286	5,371	5,481	5,887	6,497	6,854	7,558	7,669	7,407	7,530	7,061	4,440

——— Taxable Income ——— Excess Depreciation ----- Reinvested Earnings Abroad – – Book Income

Note: Taxable Income and Book Income are drawn from Compustat as described in the text and are presented for an unbalanced panel from 1982 to 2000. The number of firms for each year is presented below the year. Excess depreciation and reinvested earning abroad are the same as in Table 1 and Figure 2.

Figure 4a: Book Income versus Taxable Income, Spline Estimates by Three-Year Intervals with Industry Fixed Effects, 1992-2000
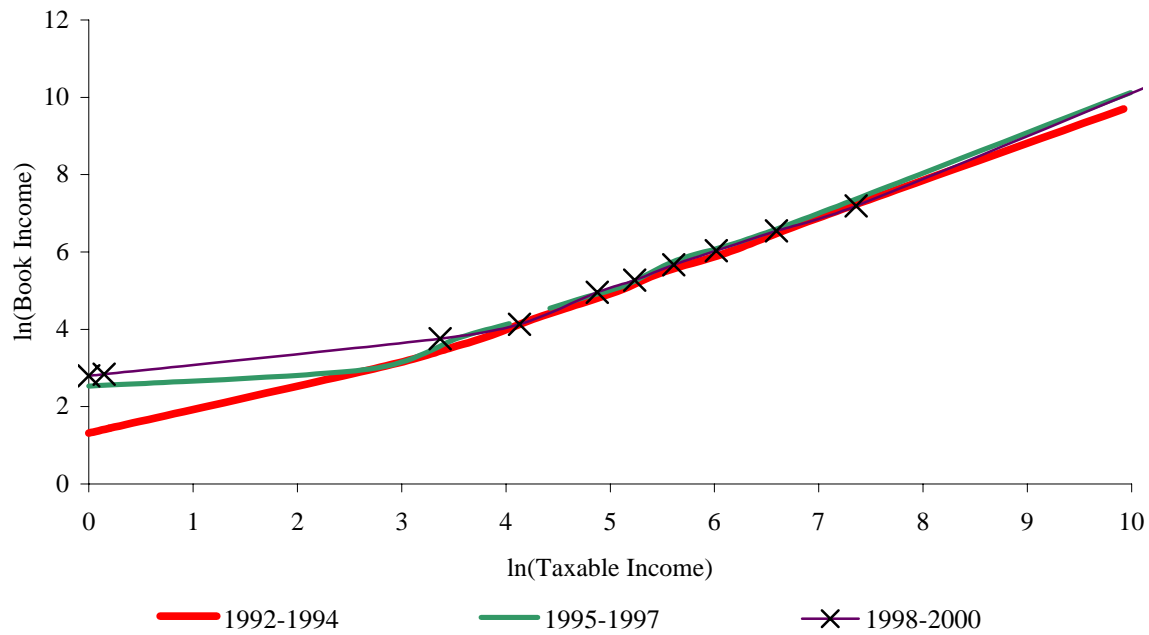
Figure 4b: Book Income versus Taxable Income, Spline Estimates by Year with Industry Fixed Effects, 1992-2000
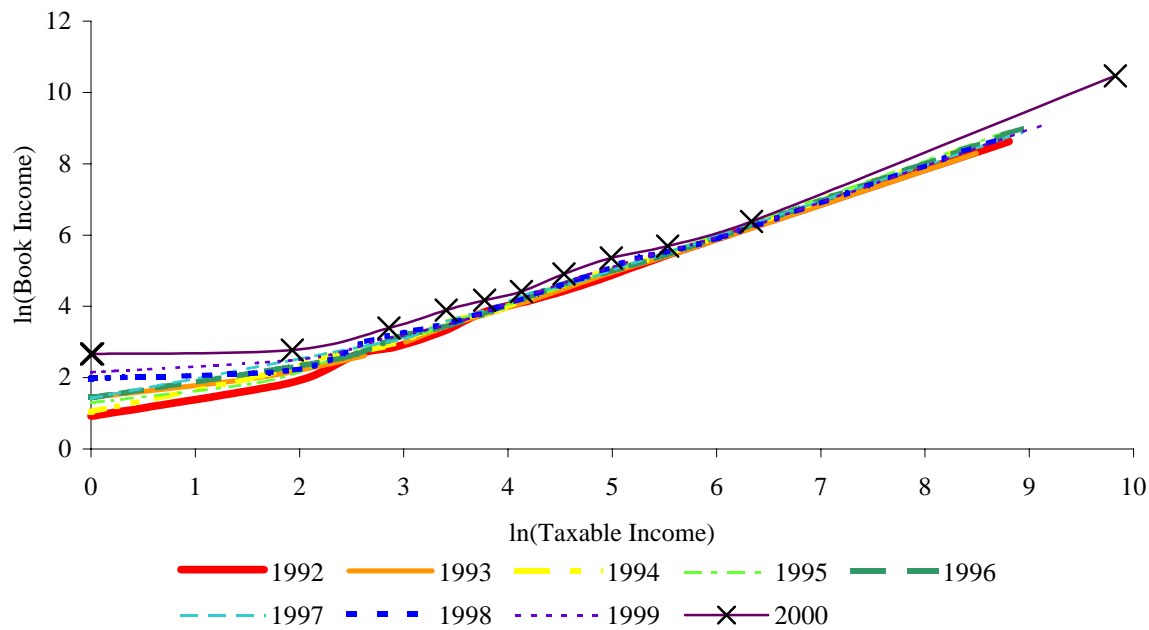
Note: In Figure 4a, the three lines are constructed using the coefficients of spline regressions reported in Table 5 where industry fixed effects are employed for the groups of years 1992-1994, 1995-1997, and 1998-2000. In Figure 4b, the lines are constructed using the coefficients of spline regressions reported in Table 6 where industry fixed effects are employed for each year from 1992 to 2000.

Figure 5a: Book Income versus Taxable Income, Earnings-Smoothing Firms, Spline Estimates by Three-Year Intervals with Industry Fixed Effects, 1992-2000
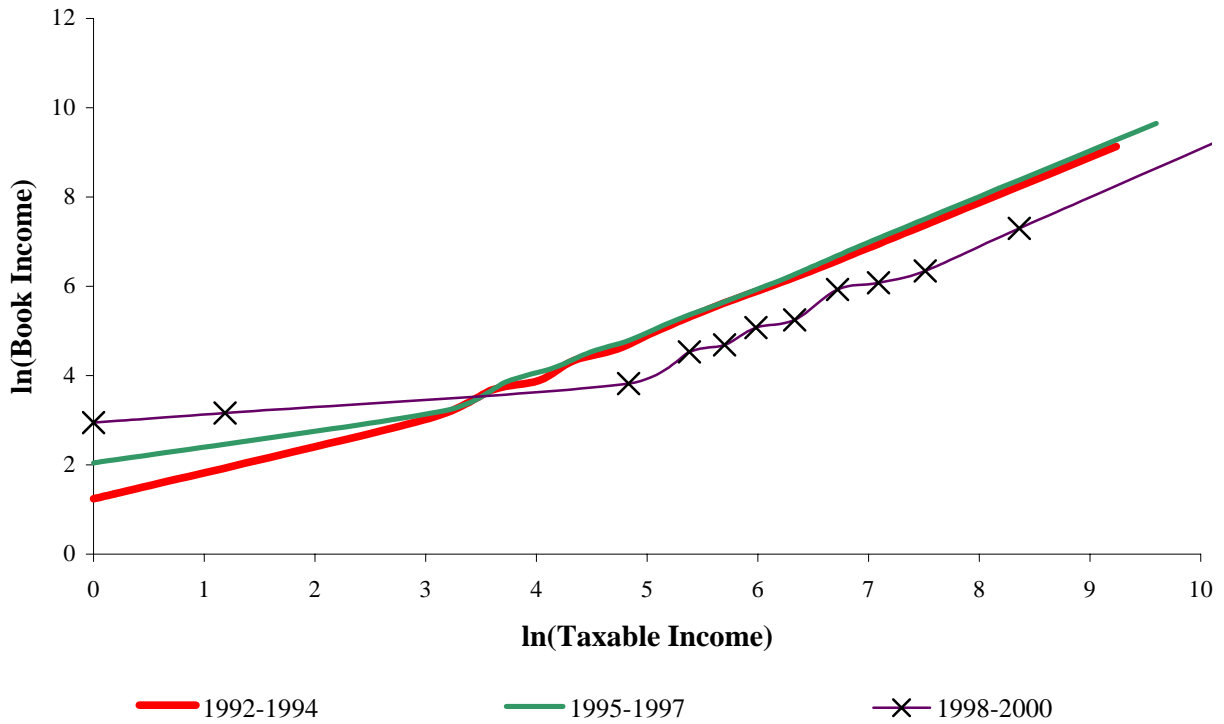
Figure 5b: Book Income versus Taxable Income, Non-Earnings-Smoothing Firms, Spline Estimates by Three-Year Intervals with Industry Fixed Effects, 1992-2000
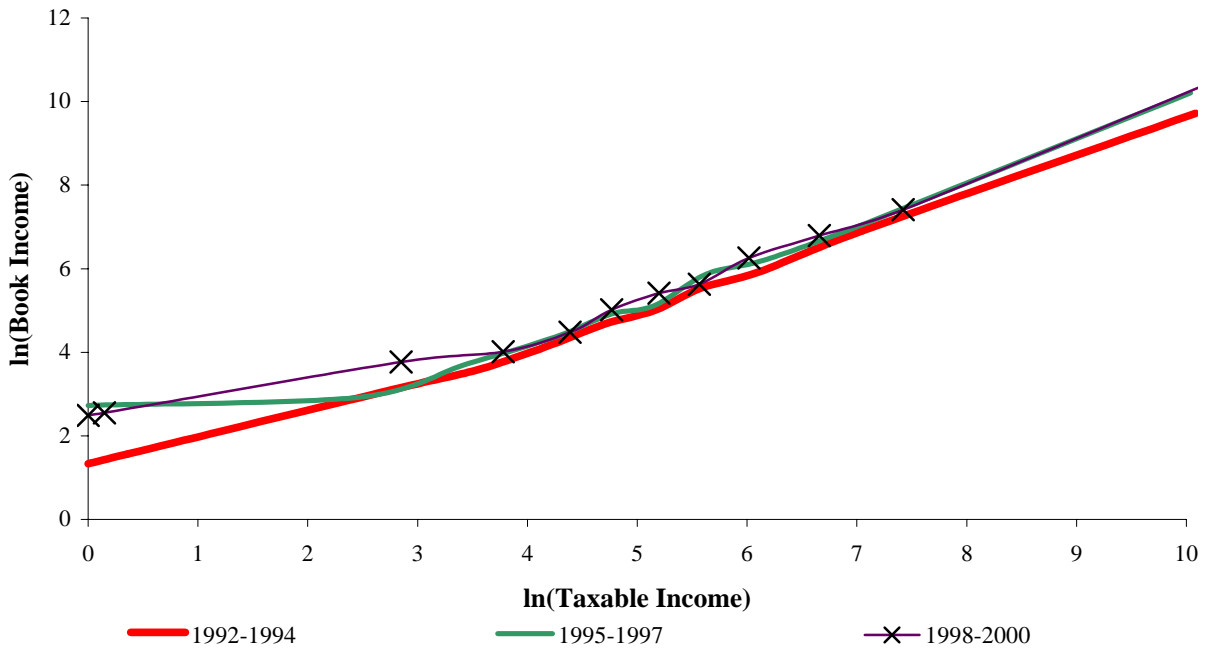
Note: In Figures 5a and 5b, the three lines are constructed using the coefficients of spline regressions reported in Table 7 for the groups of years 1992-1994, 1995-1997, and 1998-2000. The figures employ regressions for two samples of firms that are divided at the median ratio of the standard deviation of book income to the standard deviation of taxable income. Firms with ratios above the median ratio are termed "non-earnings smoothing firms" and those below the median are termed "earnings smoothing firms."

Table 1
Tax Income and Components of Simulated Book Income, 1982-2000

Year	Tax Income	Excess Depreciation	Reinvested Earnings Abroad	Proceeds from Option Exercises	Simulated Book Income
1982	110,312	8,437	4,574	na	123,323
1983	128,918	19,340	13,107	na	161,366
1984	159,186	30,276	16,803	na	206,265
1985	172,884	43,557	13,397	na	229,839
1986	197,756	33,457	9,247	na	240,460
1987	252,468	31,915	17,687	na	302,070
1988	315,510	30,341	13,447	na	359,298
1989	305,841	23,759	11,775	na	341,374
1990	300,101	13,542	20,488	na	334,132
1991	285,138	7,031	17,568	na	309,738
1992	320,529	3,014	15,733	14,086	353,362
1993	391,886	2,866	29,212	15,365	439,329
1994	443,056	8,545	23,342	10,416	485,360
1995	564,909	13,095	45,708	17,649	641,361
1996	630,053	17,427	46,035	32,412	725,928
1997	713,082	23,660	47,728	42,626	827,096
1998	649,379	27,356	31,620	73,598	781,953
1999	*649,379*	37,218	58,806	74,832	820,234
2000	*649,379*	31,243	84,111	106,265	870,998

Note: All dollar figures are in current dollars. Tax income is total receipts less total deductions for firms with greater than $250 million in assets excluding RICs, REITs, and S-Corporations. The tax income figures for 1999 and 2000 are not available so the simulated book income figure assumes that tax income stays at 1998 levels. Excess depreciation corresponds to the CCA adjustment scaled for the relative use of depreciation by firms with greater than $250 million in assets. Reinvested earnings abroad are the difference between foreign earnings and repatriations scaled for the relative levels of foreign income for firmst with greater than $250 million in assets. Option exercises are the proceeds from exercises as more fully reported in Table 2. Simulated Book Income is the sum of those figures.

Table 2
Estimates of Option Grants and Exercises, 1992-2000 (Execucomp)

Year	No. of Firms	To Top Five Executives			To All Employees	
		Grant Value ($)	Exercises ($)	Median Share of All Exercises	Grant Value ($)	Exercises ($)
1992	1,442	1,510	2,416	24.1%	8,713	14,086
1993	1,591	2,407	2,341	26.7%	12,915	15,365
1994	1,646	3,494	1,892	28.5%	17,892	10,416
1995	1,727	3,646	2,655	27.5%	20,280	17,649
1996	1,865	6,010	4,257	27.6%	32,286	32,412
1997	1,920	8,382	6,718	27.1%	47,015	42,626
1998	1,910	9,620	9,421	24.9%	79,555	73,598
1999	1,765	13,768	10,413	25.7%	123,113	74,832
2000	1,435	16,430	14,628	23.5%	199,085	106,265

Note: The data presented in this table is taken for the full universe of firms reported in the Execucomp database. Grant values represent the dollar value using the Black-Scholes valuation model of option grants; exercises represent the excess of the market value of shares under exercises options over the proceeds from exercised options; the median share of all of a company's options (based on shares granted) accounted for by the top five executives is the ratio of grants to the top five employees to all grants. Grant values for all employees are determined by grossing up the value of grants to the top five executives by a company's share of options granted to the top five executives; exercises for all employees are estimated by grossing up exercises of the top five executives by the average across all years of the median share of all exercises, excepting that if the average is less than 1%, then exercises are grossed up using 20%.

Table 3
Estimates of Option Exercises, 1996-2000 (SEC Filings)

Item	2000	1999	1998	1997	1996	Cumulative 1996-2000
Number of Companies	145	142	139	113	109	145
Median Option Exercises ($MM)	147	149	135	96	52	592
Mean Option Exercises ($MM)	543	525	362	238	132	1,684
Aggregate Option Exercises ($MM)	78,779	74,539	50,376	26,909	14,398	244,151
Median Ratio of Option Exercises to Operating Cash Flow	7.9%	7.7%	10.0%	6.8%	4.8%	9.0%
Mean Ratio of Option Exercises to Operating Cash Flow	29.1%	22.6%	19.6%	12.7%	9.8%	27.2%

Note: This table presents data compiled from SEC filings for the universe of companies with the largest market capitalization as detailed in Appendix Table 1. Median, mean and aggregate values of option exercises are calculated as the excess of market value over the average strike price where where the volume-weighted average price in a given year is used to establish market values. The median and mean ratio of option exercises to operating cash flow scales estimated annual option exercises by operating cash flows or net income, in the case of financial institutions. The underlying data for this table is provided in Appendix Table 1 and the methodology is more fully described in the data appendix.

Table 4
Reported Tax Benefits and Estimated Option Exercises, 1998-2000 (SEC Filings)

Rank	MV Rank	Company name	2000 Option Exercises / OCF	2000 Tax Benefits From Opt. Exercises	2000 Option Exercises	1999 Tax Benefits From Opt. Exercises	1999 Option Exercises	1998 Tax Benefits From Opt. Exercises	1998 Option Exercises
1	97	Lucent Technologies	668%	1,064	2,030	394	1,542	287	1,143
2	131	eBay	272%	37	273	11	229	0	849
3	145	Immunex	254%	na	437	na	135	na	16
4	77	Genentech	245%	226	475	83	310	17	na
5	147	Forest Laboratories	160%	80	289	24	44	17	53
6	29	Oracle	158%	na	3,437	na	710	na	144
7	128	Maxim Integrated	138%	239	667	155	488	137	254
8	12	AOL-Time Warner	115%	na	2,247	na	7,271	na	1,898
9	15	Cisco Systems	113%	1,397	6,940	2,495	4,478	837	2,340
10	35	Amgen	92%	377	1,505	152	725	108	372
11	78	EMC	81%	208	1,716	58	565	44	228
12	109	Charles Schwab	80%	na	578	na	713	na	198
13	33	Dell Computer	79%	929	3,314	1,040	3,093	444	2,407
14	73	Applied Materials	77%	387	1,272	161	610	28	106
15	28	American Home Prod.	72%	na	398	na	307	na	557
16	63	Sun Microsystems	72%	816	2,684	708	1,134	222	418
17	129	Compaq Computer	69%	234	392	142	310	104	702
18	4	Pfizer	69%	na	4,288	na	2,286	na	2,292
19	106	Kohl's	69%	99	256	47	115	10	23
20	133	Analog Devices	66%	44	466	15	116	13	38
21	42	Pharmacia	57%	na	955	na	237	na	439
22	2	Microsoft	56%	3,107	7,795	5,535	15,325	2,066	7,438
23	41	Texas Instruments	45%	na	985	na	763	na	207
24	103	UnitedHealth Group	41%	na	304	na	45	na	84
25	10	Intel	41%	887	5,234	506	2,928	415	2,375
26	53	Merrill Lynch	38%	na	1,446	na	443	na	428
27	67	Cardinal Health	35%	159	303	47	161	65	192
28	83	Marsh & McLennan	33%	na	392	na	169	na	102
29	62	Hewlett-Packard	33%	495	1,446	289	768	157	371
30	68	Automatic Data Proc.	28%	na	297	na	181	na	142

Tax Benefit From Option Exercises	Mean		31.9%		31.8%		31.7%	
Scaled by Option Exericses:	Median		30.4%		30.4%		30.3%	

Note: This table reports reported tax benefits from option exercies and estimated option exercises in 1998, 1999 and 2000 for those thirty firms with the highest ratios of option exercises to operating cash flow in 2000. The means and medians presented at the bottom of the table are for the ratio of reported tax benefits by estimated by option exercises for each year.

Table 5: Piecewise Linear Regression of Book Income on Taxable Income
with and without Industry Fixed Effects, 1992-1994, 1995-1997, 1998-2000

	1992-1994		1995-1997		1998-2000	
	No Fixed Effects	Fixed Effects	No Fixed Effects	Fixed Effects	No Fixed Effects	Fixed Effects
Constant	1.3091	1.3175	2.5274	2.5313	2.9443	2.7976
	(0.3728)	(0.3888)	(0.2885)	(0.2619)	(0.4228)	(0.3982)
Spline 1	0.6101	0.6090	0.1719	0.1626	0.2209	0.2846
	(0.1588)	(0.1646)	(0.1243)	(0.1137)	(0.1526)	(0.1466)
Spline 2	0.6852	0.7562	0.8781	0.9478	0.6046	0.4861
	(0.2032)	(0.2038)	(0.1436)	(0.1367)	(0.2360)	(0.2306)
Spline 3	0.9361	0.8258	0.8224	0.7543	0.9907	1.1018
	(0.2440)	(0.2321)	(0.1854)	(0.1799)	(0.2856)	(0.2909)
Spline 4	0.9662	1.0494	1.0021	1.0285	1.1847	1.1239
	(0.1726)	(0.1678)	(0.2379)	(0.2268)	(0.2906)	(0.2992)
Spline 5	0.8916	0.8860	0.8546	0.8370	0.7383	0.8768
	(0.1947)	(0.1919)	(0.2146)	(0.2020)	(0.2765)	(0.2755)
Spline 6	0.9957	0.8900	0.8358	0.8139	1.1002	1.0636
	(0.1520)	(0.1483)	(0.2018)	(0.1930)	(0.2643)	(0.2512)
Spline 7	1.1361	1.1440	1.3056	1.3244	1.0382	0.8919
	(0.1618)	(0.1544)	(0.1906)	(0.1939)	(0.2213)	(0.1958)
Spline 8	0.8743	0.8135	0.8199	0.7767	0.8000	0.8953
	(0.1133)	(0.1122)	(0.1302)	(0.1401)	(0.1474)	(0.1380)
Spline 9	1.0190	1.0284	1.0207	0.9718	0.9592	0.8450
	(0.0773)	(0.0792)	(0.0645)	(0.0775)	(0.1056)	(0.1131)
Spline 10	0.9946	0.9624	1.0076	1.0436	1.0701	1.1052
	(0.0317)	(0.0367)	(0.0263)	(0.0342)	(0.0364)	(0.0447)
R^2 / Adjusted R^2	0.9096	0.9162	0.8923	0.9056	0.8626	0.8766
# of Obs	1229	1229	1384	1384	942	942
Categories Absorbed	-	62	-	62	-	61

Note: The dependent variable in all specifications is the logarithm of book income summed across relevant years. The percentile splines create separate coefficients depending on the logarithm of taxable income summed across relevant years. Columns 2, 4 and 6 employ industry fixed effects.

Table 6: Piecewise Linear Regression with Industry Fixed Effects
of Book Income on Taxable Income, 1992-2000

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Constant	0.9221	1.4416	1.0461	1.2975	1.4429	1.4224	1.9782	2.1532	2.6624
	(0.2136)	(0.2089)	(0.1979)	(0.2029)	(0.2042)	(0.2518)	(0.1926)	(0.2844)	(0.2986)
Spline 1	0.4679	0.3460	0.6130	0.3568	0.4436	0.5504	0.1238	0.1810	0.0559
	(0.1970)	(0.1747)	(0.1562)	(0.1630)	(0.1571)	(0.1487)	(0.1178)	(0.1629)	(0.1880)
Spline 2	0.6038	0.5475	0.8457	0.9292	0.5225	0.5824	1.1510	0.7601	0.6668
	(0.2779)	(0.1636)	(0.1805)	(0.1911)	(0.1724)	(0.1832)	(0.1795)	(0.2308)	(0.1992)
Spline 3	1.3733	0.6738	0.4266	0.9815	1.1345	0.5570	0.6736	0.6069	0.9205
	(0.2809)	(0.2161)	(0.2388)	(0.1795)	(0.1943)	(0.2734)	(0.1945)	(0.2687)	(0.2437)
Spline 4	0.5679	0.9569	0.9881	0.6111	0.6427	1.2264	0.6396	0.7847	0.7717
	(0.2645)	(0.2432)	(0.2223)	(0.2175)	(0.2209)	(0.2425)	(0.2190)	(0.2498)	(0.2970)
Spline 5	0.9645	1.1064	1.2009	1.2016	0.9345	0.8375	0.9491	1.1460	0.6898
	(0.2177)	(0.2316)	(0.1953)	(0.2131)	(0.2061)	(0.1833)	(0.2111)	(0.2718)	(0.2896)
Spline 6	1.3501	0.8847	0.5972	0.8626	1.1042	1.1791	1.0307	1.0769	1.2049
	(0.2285)	(0.1905)	(0.1709)	(0.2129)	(0.1896)	(0.2034)	(0.1553)	(0.2352)	(0.2357)
Spline 7	0.7359	0.9375	1.1741	0.9514	1.0503	0.6881	0.9960	1.0145	0.9885
	(0.1771)	(0.1539)	(0.1380)	(0.1768)	(0.1554)	(0.1543)	(0.1448)	(0.1929)	(0.2159)
Spline 8	0.8858	1.0153	0.9654	0.9487	0.8010	0.9800	1.0569	0.8993	0.6027
	(0.1490)	(0.1167)	(0.1216)	(0.1079)	(0.1028)	(0.1259)	(0.1369)	(0.1662)	(0.2155)
Spline 9	1.0469	0.8999	0.8810	0.9833	0.9546	0.9367	0.7337	0.8318	0.8609
	(0.0961)	(0.1129)	(0.0730)	(0.0849)	(0.0901)	(0.0853)	(0.0884)	(0.1113)	(0.1721)
Spline 10	0.9719	0.9724	1.0358	1.0439	1.0439	0.9955	1.0343	1.0151	1.1715
	(0.0483)	(0.0618)	(0.0380)	(0.0433)	(0.0357)	(0.0338)	(0.0345)	(0.0583)	(0.0757)
Adjusted R^2	0.8785	0.8776	0.8879	0.8893	0.8674	0.8682	0.8732	0.8173	0.8217
# of Obs.	1289	1429	1521	1542	1591	1529	1437	1370	991
Cat. Absorbed	62	62	62	61	62	62	63	63	61

Note: The dependent variable in all specification is the logarithm of book income in a given year. The percentile splines create separate coefficients depending on the logarithm of taxable income in a given year.

Table 7: Piecewise Linear Regression of Book Income on Taxable Income with Industry Fixed Effects, 1992-1994, 1995-1997, 1998-2000

	Earnings-Smoothing Firms			Non-Earnings-Smoothing Firms		
	1992-1994	1995-1997	1998-2000	1992-1994	1995-1997	1998-2000
Constant	1.2383	2.0452	2.9492	1.3308	2.7289	2.4859
	(0.6463)	(0.2573)	(0.5058)	(0.5457)	(0.4368)	(0.5010)
Spline 1	0.5950	0.3673	0.1806	0.6395	0.0802	0.4503
	(0.2472)	(0.0898)	(0.1430)	(0.2515)	(0.2096)	(0.2332)
Spline 2	1.1182	1.1662	1.2951	0.6115	0.8189	0.2631
	(0.2608)	(0.1845)	(0.2963)	(0.2432)	(0.1964)	(0.3181)
Spline 3	0.5037	0.7375	0.5001	0.8447	0.7807	0.7671
	(0.3286)	(0.2063)	(0.3719)	(0.2442)	(0.2901)	(0.3013)
Spline 4	1.4327	1.0750	1.3600	0.9654	0.8755	1.4259
	(0.2740)	(0.2999)	(0.4390)	(0.3519)	(0.3312)	(0.3657)
Spline 5	0.6570	0.7543	0.4971	1.0318	1.0981	0.9210
	(0.2250)	(0.2737)	(0.3181)	(0.3084)	(0.2787)	(0.3382)
Spline 6	1.1333	1.0672	1.7572	0.7238	0.4744	0.5751
	(0.2493)	(0.1892)	(0.3039)	(0.2155)	(0.3604)	(0.3955)
Spline 7	1.0332	0.9333	0.4019	1.2591	1.5830	1.4016
	(0.1946)	(0.1858)	(0.3154)	(0.2243)	(0.3078)	(0.2877)
Spline 8	0.9188	0.9695	0.6261	0.7336	0.6411	0.8319
	(0.1113)	(0.1464)	(0.2888)	(0.1787)	(0.2304)	(0.1804)
Spline 9	0.9860	1.0733	1.1190	1.0461	0.9444	0.8093
	(0.1422)	(0.1049)	(0.1636)	(0.1095)	(0.1095)	(0.1503)
Spline 10	1.0162	1.0260	1.0885	0.9285	1.0567	1.0879
	(0.0570)	(0.0440)	(0.0672)	(0.0508)	(0.0528)	(0.0680)
Adjusted R^2	0.9382	0.9432	0.8896	0.8990	0.8839	0.8817
# of Obs.	535	604	434	694	780	508
Categories Absorbed	55	57	57	60	62	59

Note: The dependent variable in all specification is the logarithm of book income in given years. The percentile splines create separate coefficients depending on the logarithm of taxable income in given years. Columns 1, 2, and 3 report specifications for those firms with a below median ratio of standard deviation of book income to standard deviation of taxable income. Columns 4, 5, and 6 report specifications for those firms with an above median ratio of standard deviation of book income to standard deviation of taxable income.

Data Appendix for Firm-by-Firm Estimates

The sample is based on the 150 largest corporations by market value on November 6, 2001 and restricted to companies based in the 50 U.S. states in order to exclude foreign corporations. For each company matching these criteria, Compustat data for net income, cash flow from operations, and five-year annualized total return from January 1, 1996 through December 31, 2000 were compiled. Stock option exercise data was collected from the tables in the footnotes to consolidated financial statements outlining annual stock option activity found in public documents filed with the SEC and company annual reports.

The following method was used to estimate non-qualified stock option exercises as a fraction of a company's operating cash flow. For each year from 1996 through 2000, the total number of options exercised was multiplied by the difference between the volume-weighted average daily closing stock price during the year and the weighted average exercise price per share for these options to determine the total dollar value of stock option exercises. No adjustment was made for companies that have fiscal years not ending on December 31. In some cases public documents noted whether stock option plans were entirely non-qualified, but this distinction was not always clarified. As a result, the stock option exercise data include both qualified and non-qualified stock option exercises. They exclude restricted stock awards, stock appreciation rights (SARs), and other non-stock option stock-based compensation. This value was then divided by operating cash flow. In the special case of financial institutions, where the meaning of operating cash flow is obscured by the fact that it captures what other companies might consider investing and financing activities, net income replaces operating cash flow as the denominator. Companies were determined to be financial institutions if their primary SIC code was listed as 6021, 6036, 6111, 6141, 6211, 6282, 6311, 6324, 6331, 6411, or 6712. Finally, the ratio of cumulative stock option exercises to operating cash flow is the quotient of the cumulated stock option exercises and operating cash flows over each year in which a given company has available data for both of these figures.

Many of the companies in the sample underwent significant merger or acquisition transactions between 1996 and 2000. In order to assure consistency in calculations the following adjustments were made. For transactions accounted for as a "pooling of interest" the historical Compustat data was adjusted to reflect the combined operations or the merged companies. Specifically, although companies are required to restate historical accounting periods in their financial statements, Compustat reports in any given year income statement figures as reported in those years. Accordingly, the Compustat figures were replaced by income statement figures from the most recent available annual report. For transactions treated under purchase accounting, companies recognize both income statement results and stock option activity for the acquiring entity only. As such, consistency is preserved and no adjustments were made. Several companies in the sample have significant units that trade as tracking stocks (in fact, several of the tracking stocks are independently in the sample). In these cases, parent company stock option activity is treated separately from and ignores the implicit ownership interest in the stock option activity of the tracked unit.

Appendix Figure 1a
Calculated Book and Taxable Income for Balanced Panel, 1982-2000

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
	524	524	524	524	524	524	524	524	524	524	524	524	524	524	524	524	524	524	356

——— Taxable Income   ━ ━ Book Income
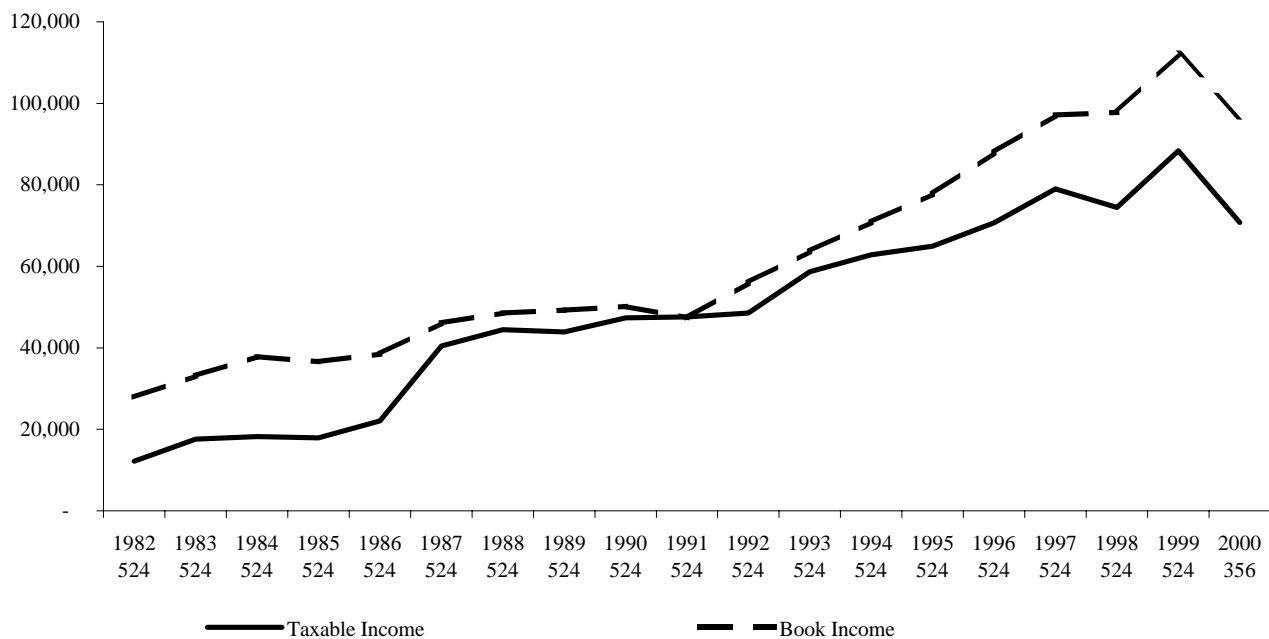
Appendix Figure 1b
Calculated Book and Taxable Income for Unbalanced Panel, 1992-2000

	1992	1993	1994	1995	1996	1997	1998	1999	2000
	1,582	1,714	1,804	1,902	1,913	1,828	1,778	1,665	1,171

——— Taxable Income   ━ ━ Book Income
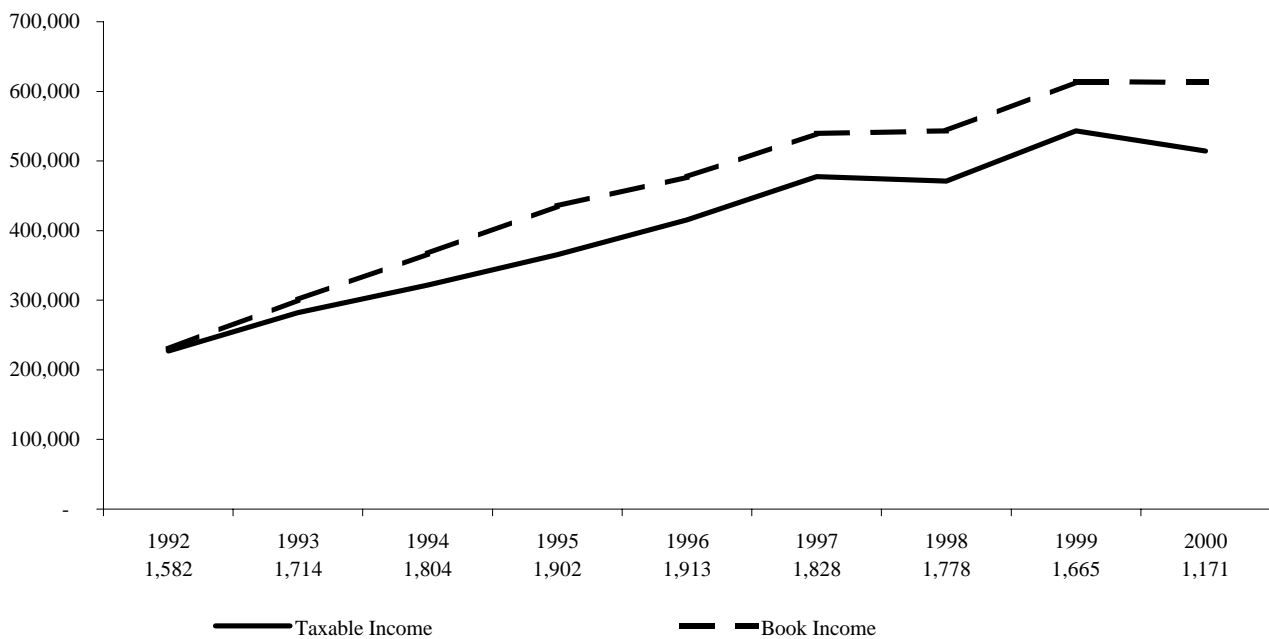
Note: Appendix Figure 1a reports taxable and book income as calculated from Compustat as reported in the text for a balanced panel of firms from 1982 to 2000. Appendix Figure 1b reports taxable and book income as calculated from Compustat as reported in the text for those firms with detailed compensation data from 1992 to 2000.

Appendix Figure 2a: Book Income versus Taxable Income, Firms Above Median Sales, Spline Estimates by Three-Year Intervals with Industry Fixed Effects, 1992-2000
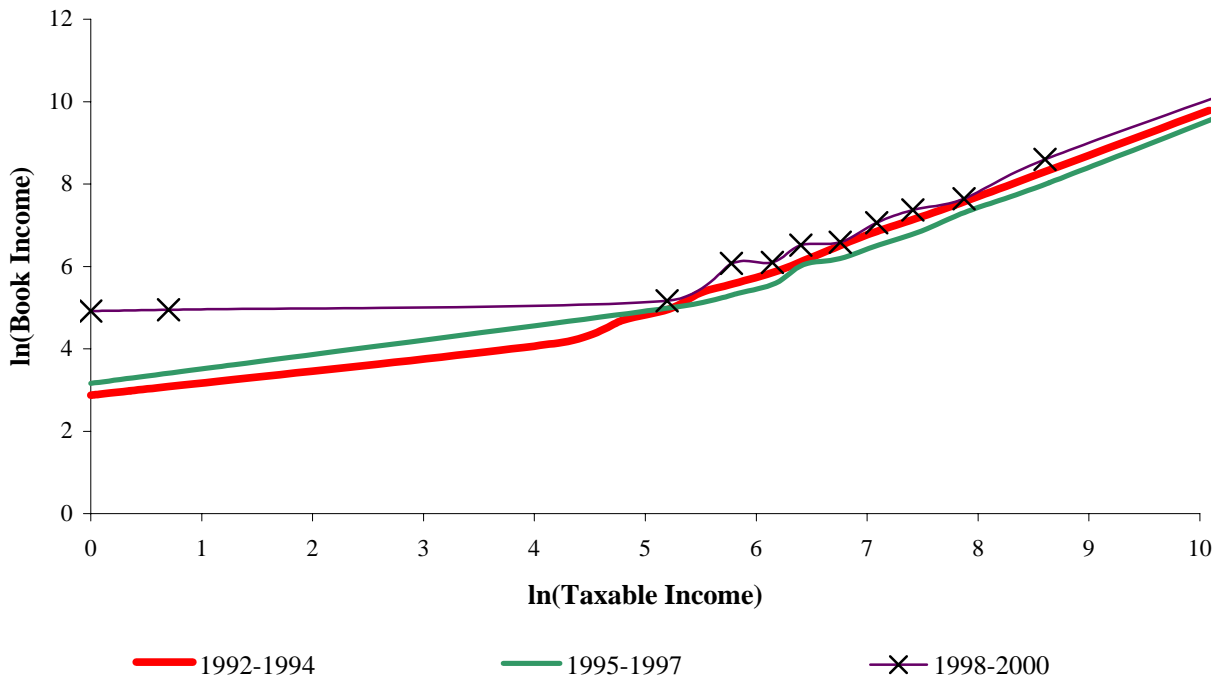
Appendix Figure 2b: Book Income versus Taxable Income, Firms Below Median Sales, Spline Estimates by Three-Year Intervals with Industry Fixed Effects, 1992-2000
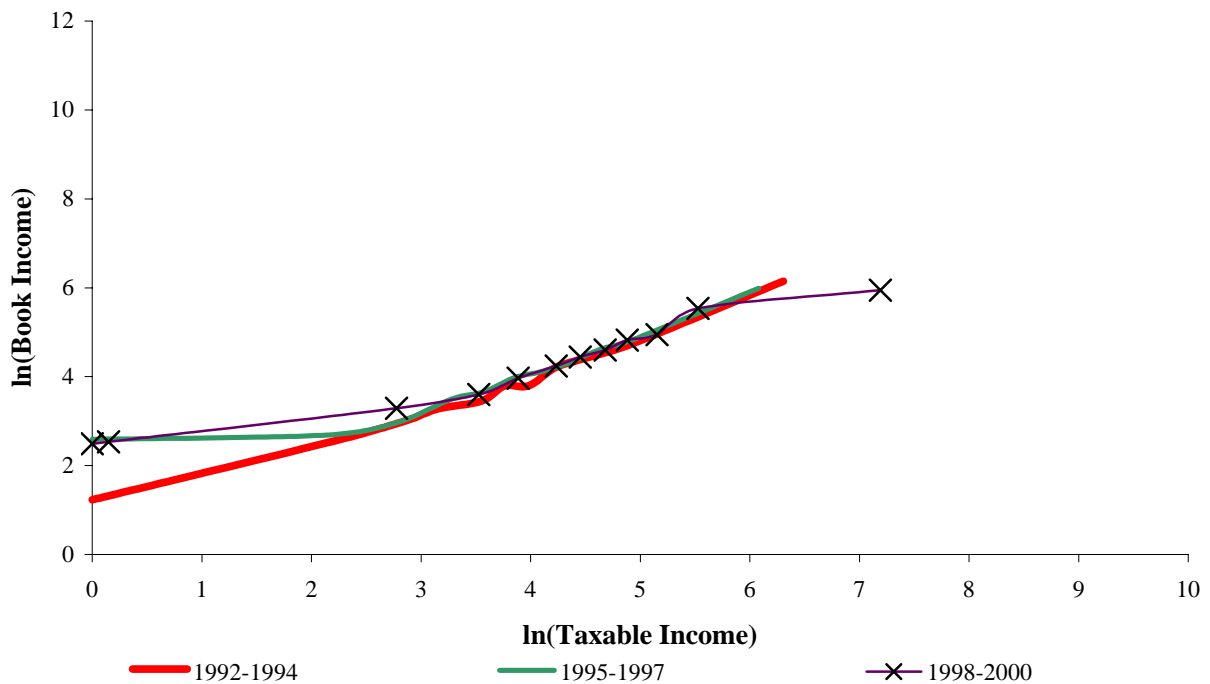
Note: In Appendix Figures 2a and 2b, the three lines are constructed using the coefficients of spline regressions reported in Appendix Table 2 for the groups of years 1992-1994, 1995-1997, and 1998-2000. The figures employ regressions for two samples of firms that are divided at the median level of sales in the first year of every three year period.

Appendix Table 1
Firm-by-Firm Estimates of Option Exercises, 1996-2000 (SEC Filings)

				Estimated Proceeds from Option Exercises ($mm)[1]					Ratio of Option Exercises to Operating Cash Flow or Net Income[2]					Cumulative 96-00[3]	
Rank	Company (a)	MV as of 11/6 ($bn)	Annualized Total Ret. (96-00)	2000	1999	1998	1997	1996	2000	1999	1998	1997	1996	Exer.	Ratio
1	General Electric (5)	386.3	33.92	1,887	1,903	1,512	937	458	8%	8%	8%	7%	3%	6,697	7%
2	Microsoft (5)	336.0	31.65	7,795	15,325	7,438	4,445	2,082	56%	153%	108%	95%	56%	37,086	94%
3	Exxon Mobil (3) (b)	282.1	19.77	127	92	107	na	na	1%	1%	1%	na	na	325	1%
4	Pfizer (3) (b)	269.6	35.81	4,288	2,286	2,292	na	na	69%	42%	44%	na	na	8,866	53%
5	Citigroup (5) (c)	244.4	38.89	2,693	1,407	766	1,615	642	20%	14%	13%	52%	28%	7,123	21%
6	Wal-Mart Stores (5)	238.6	37.54	308	302	175	44	0	3%	4%	2%	1%	0%	830	2%
7	American Int'l Group (3) (b) (c)	219.7	35.41	378	270	79	na	na	7%	5%	2%	na	na	727	5%
8	Int'l Business Machines (5)	193.0	30.98	1,358	1,762	1,175	875	431	15%	17%	13%	10%	4%	5,601	12%
9	Johnson & Johnson (5)	183.0	21.34	132	214	216	137	59	2%	4%	4%	3%	2%	758	3%
10	Intel (5)	174.0	33.70	5,234	2,928	2,375	1,689	856	41%	26%	26%	17%	10%	13,082	25%
11	Merck & Co. (5)	150.6	25.49	1,618	1,018	1,415	906	625	21%	17%	27%	14%	12%	5,581	18%
12	AOL-Time Warner (3) (b)	148.5	71.53	2,247	7,271	1,898	na	na	115%	443%	343%	na	na	11,416	275%
13	Verizon Communications (5)	137.1	12.20	235	789	607	290	60	1%	7%	6%	3%	1%	1,980	4%
14	SBC Communications (3) (b)	131.8	13.60	650	553	553	na	na	5%	3%	4%	na	na	1,756	4%
15	Cisco Systems (5)	126.8	55.96	6,940	4,478	2,340	725	685	113%	101%	81%	50%	64%	15,168	95%
16	Coca-Cola (5)	122.2	11.56	346	212	837	472	286	10%	5%	24%	12%	8%	2,153	12%
17	Berkshire Hathaway (5) (c)	110.7	17.21	0	0	0	0	0	-	-	-	-	-	0	-
18	Philip Morris (5)	109.0	13.39	28	82	256	286	332	0%	1%	3%	3%	4%	984	2%
19	Bristol-Myers Squibb (5)	108.4	30.65	558	961	1,365	99	0	12%	22%	33%	4%	-	2,984	16%
20	Bank of America (5) (c)	97.2	8.84	89	540	841	1,220	383	1%	7%	16%	40%	16%	3,074	12%
21	ChevronTexaco (5)	96.0	13.51	38	59	33	25	14	0%	1%	1%	1%	0%	169	1%
22	Procter & Gamble (5)	95.1	15.38	244	519	568	412	246	5%	9%	12%	7%	6%	1,989	8%
23	Home Depot (5)	94.1	34.36	545	465	205	58	0	20%	19%	11%	6%	0%	1,275	14%
24	Eli Lilly & Co. (5)	89.6	28.92	526	608	723	390	272	14%	23%	27%	16%	14%	2,519	19%
25	PepsiCo (5)	85.2	15.62	650	411	618	503	375	17%	14%	19%	5%	9%	2,557	11%
26	Abbott Laboratories (5)	84.2	20.46	227	244	308	296	124	7%	8%	11%	11%	5%	1,199	9%
27	Fannie Mae (5) (c)	81.0	25.12	156	112	163	108	0	4%	3%	5%	4%	0%	540	3%
28	American Home Prod. (5)	76.3	23.80	398	307	557	363	293	72%	14%	37%	21%	12%	1,918	23%
29	Oracle (5)	75.5	56.07	3,437	710	144	175	165	158%	24%	8%	11%	16%	4,632	48%
30	J.P. Morgan Chase (3) (b) (c)	74.6	21.22	710	985	602	na	na	12%	13%	13%	na	na	2,297	13%
31	BellSouth (5)	70.4	16.26	203	55	56	34	9	2%	1%	1%	0%	0%	357	1%
32	Wells Fargo (5) (c)	70.1	30.36	280	294	273	334	116	7%	8%	14%	25%	10%	1,297	11%
33	Dell Computer (5)	66.6	74.36	3,314	3,093	2,407	543	103	79%	79%	99%	34%	8%	9,459	70%
34	Viacom (5)	65.8	14.57	441	118	147	10	31	19%	40%	17%	3%	43%	747	19%
35	Amgen (5)	62.2	33.92	1,505	725	372	261	281	92%	67%	36%	29%	34%	3,145	57%
36	Kraft Foods (0)	59.5	na	na	na	na	na	na	na	na	na	na	na	na	na
37	United Parcel Service (2)	57.2	na	345	440	na	na	na	13%	20%	na	na	na	785	16%
38	Morgan Stanley (5) (c)	57.1	47.05	1,023	498	712	525	162	19%	10%	22%	20%	16%	2,921	17%
39	AT&T (5)	56.6	-7.62	137	543	359	184	361	1%	5%	3%	2%	5%	1,585	3%
40	Schering-Plough (5)	55.0	34.76	253	292	345	127	83	10%	15%	17%	7%	6%	1,100	11%
41	Texas Instruments (3) (b)	53.4	49.91	985	763	207	na	na	45%	32%	15%	na	na	1,955	33%

Appendix Table 1
Firm-by-Firm Estimates of Option Exercises, 1996-2000 (SEC Filings)

		SUMMARY INFORMATION		Estimated Proceeds from Option Exercises ($mm)[1]					Ratio of Option Exercises to Operating Cash Flow or Net Income[2]					Cumulative 96-00[3]	
Rank	Company (a)	MV as of 11/6 ($bn)	Annualized Total Ret. (96-00)	2000	1999	1998	1997	1996	2000	1999	1998	1997	1996	Exer.	Ratio
42	Pharmacia (3) (b)	51.2	23.30	955	237	439	na	na	57%	13%	31%	na	na	1,631	33%
43	Medtronic (3)	51.1	34.62	99	87	89	na	na	5%	8%	20%	na	na	274	8%
44	Freddie Mac (3) (c)	46.8	28.52	85	51	60	na	na	3%	2%	4%	na	na	197	3%
45	Minnesota Mining & Mfg. (3) (b)	43.3	16.43	147	145	113	na	na	6%	5%	5%	na	na	405	5%
46	E.I. DuPont de Nemours (5)	42.9	9.36	72	227	253	326	323	1%	2%	7%	5%	5%	1,201	4%
47	QUALCOMM (5)	42.0	73.34	1	1	0	38	31	0%	0%	nm	nm	nm	72	8%
48	American Express (5) (c)	40.7	33.29	456	445	255	296	148	16%	18%	12%	15%	8%	1,600	14%
49	Bank One (4) (c)	40.0	6.99	26	130	312	443	na	nm	4%	10%	34%	na	911	12%
50	Goldman Sachs (1) (c)	39.8	na	1	na	na	na	na	0%	na	na	na	na	1	0%
51	WorldCom (5)	39.6	3.66	600	2,392	1,065	592	174	8%	22%	26%	45%	22%	4,822	19%
52	Walt Disney (5)	39.2	8.78	496	237	905	233	95	8%	4%	18%	3%	2%	1,967	7%
53	Merrill Lynch (5) (c)	39.0	41.74	1,446	443	428	403	179	38%	17%	34%	21%	11%	2,899	26%
54	FleetBoston Financial (3) (b) (c)	38.6	16.51	63	96	135	na	na	2%	5%	6%	na	na	294	4%
55	Motorola (3) (b)	37.8	2.00	423	669	145	na	na	nm	31%	11%	na	na	1,237	54%
56	Anheuser-Busch (5)	37.6	25.11	225	161	110	82	71	10%	8%	5%	4%	3%	649	6%
57	McDonald's (5)	37.3	9.20	211	535	427	209	233	8%	18%	15%	9%	9%	1,615	12%
58	AT&T Wireless Services (0)	37.2	na	na	na	na	na	na	na	na	na	na	na	na	na
59	U.S. Bancorp (5) (c)	36.4	31.42	9	42	32	0	0	1%	5%	7%	-	-	82	3%
60	Comcast (5)	34.9	35.97	147	231	70	10	2	12%	18%	6%	1%	0%	459	9%
61	Walgreen (5)	34.8	42.21	138	79	99	43	7	14%	13%	17%	7%	2%	367	11%
62	Hewlett-Packard (5)	34.6	12.07	1,446	768	371	388	253	33%	25%	7%	9%	7%	3,227	16%
63	Sun Microsystems (5)	33.7	57.77	2,684	1,134	418	263	146	72%	45%	27%	24%	21%	4,646	48%
64	Fifth Third Bancorp (5) (c)	33.4	34.71	61	89	64	33	15	7%	13%	13%	8%	4%	262	10%
65	Gillette (5)	33.2	8.06	34	154	179	283	0	2%	10%	14%	22%	0%	650	9%
66	Colgate-Palmolive (5)	32.5	31.75	207	324	284	181	61	13%	25%	24%	16%	7%	1,058	18%
67	Cardinal Health (3) (b)	32.3	32.78	303	161	192	na	na	35%	32%	65%	na	na	656	39%
68	Automatic Data Proc. (3)	31.9	28.85	297	181	142	na	na	28%	21%	17%	na	na	620	22%
69	Dow Chemical (5)	31.5	13.34	18	40	23	25	32	2%	1%	1%	1%	1%	138	1%
70	Liberty Media (0)	31.2	35.35	na	na	na	na	na	na	na	na	na	na	na	na
71	Electronic Data Systems (5)	30.3	3.43	12	33	0	0	0	1%	2%	-	-	-	45	0%
72	Ford Motor Company (5)	30.2	21.58	142	324	437	134	63	0%	1%	2%	0%	0%	1,101	1%
73	Applied Materials (5)	30.1	31.15	1,272	610	106	217	41	77%	65%	13%	31%	6%	2,246	47%
74	Boeing (5)	30.1	12.38	98	43	53	137	205	2%	1%	2%	7%	9%	536	3%
75	Duke Energy (5)	29.8	17.03	27	14	37	25	23	1%	1%	2%	1%	2%	125	1%
76	Wachovia (5) (c)	29.7	4.01	0	0	23	24	4	-	-	1%	1%	0%	51	1%
77	Genentech (2)	29.6	43.90	475	310	na	na	na	245%	nm	na	na	na	785	422%
78	EMC (5)	29.6	103.15	1,716	565	228	95	80	81%	41%	27%	19%	17%	2,684	50%
79	Alcoa (5)	29.6	22.60	239	474	33	120	85	8%	21%	1%	6%	7%	951	9%
80	Qwest Communications (4)	29.5	20.48	664	349	266	0	na	18%	8%	7%	-	na	1,279	8%
81	Kimberly-Clark (5)	29.5	13.55	81	64	41	72	230	4%	3%	2%	5%	14%	487	5%
82	Baxter International (5)	29.4	21.43	97	51	49	50	65	8%	5%	5%	8%	8%	312	7%

Appendix Table 1
Firm-by-Firm Estimates of Option Exercises, 1996-2000 (SEC Filings)

	SUMMARY INFORMATION			Estimated Proceeds from Option Exercises ($mm)[1]					Ratio of Option Exercises to Operating Cash Flow or Net Income[2]					Cumulative 96-00[3]	
Rank	Company (a)	MV as of 11/6 ($bn)	Annualized Total Ret. (96-00)	2000	1999	1998	1997	1996	2000	1999	1998	1997	1996	Exer.	Ratio
83	Marsh & McLennan (5) (c)	28.5	35.12	392	169	102	102	34	33%	23%	13%	23%	7%	798	22%
84	Target (5)	28.4	40.35	102	64	62	43	11	5%	3%	3%	2%	1%	282	3%
85	First Data (5)	27.5	9.74	125	98	24	56	148	11%	7%	2%	5%	14%	451	8%
86	Washington Mutual (5) (c)	27.3	25.64	0	18	43	170	13	-	1%	3%	35%	12%	244	4%
87	Lowe's Companies (5)	26.9	22.08	2	4	0	0	0	0%	0%	-	-	-	6	0%
88	United Technologies (5)	26.7	29.04	349	306	198	111	70	14%	7%	8%	5%	3%	1,035	8%
89	Bank of New York (5) (c)	26.5	38.04	173	124	116	115	44	12%	7%	10%	10%	4%	572	9%
90	Household International (5)	26.5	24.59	63	200	198	74	56	2%	6%	8%	4%	3%	592	4%
91	MBna (5) (c)	25.6	40.17	200	119	166	101	38	15%	12%	21%	16%	8%	624	15%
92	El Paso (5)	25.5	41.15	96	38	20	22	10	nm	8%	4%	4%	3%	186	22%
93	General Motors (5)	25.0	7.40	255	236	187	164	85	1%	1%	1%	1%	0%	926	1%
94	Clear Channel Communic. (5)	24.8	34.43	87	174	56	26	3	11%	27%	21%	16%	3%	347	18%
95	Honeywell International (3) (b)	24.3	16.44	263	572	217	na	na	13%	24%	11%	na	na	1,052	17%
96	Cox Communications (5)	23.8	36.71	19	14	17	2	0	6%	3%	3%	0%	0%	52	2%
97	Lucent Technologies (3) (b)	23.7	na	2,030	1,542	1,143	na	na	668%	nm	79%	na	na	4,715	594%
98	Allstate (5) (c)	23.4	18.25	44	20	0	66	14	2%	1%	-	2%	1%	144	1%
99	Sprint PCS Group (3)	22.5	na	520	220	0	na	na	nm	nm	nm	na	na	740	nm
100	Emerson (5)	22.3	16.58	33	32	43	25	16	2%	2%	3%	2%	1%	148	2%
101	Lockheed Martin (5)	21.8	-1.08	6	8	74	96	117	0%	1%	4%	8%	7%	301	4%
102	Safeway (5)	21.6	37.16	402	203	260	171	136	21%	14%	21%	14%	17%	1,173	18%
103	UnitedHealth Group (5) (c)	21.1	13.49	304	45	84	95	38	41%	8%	nm	21%	11%	565	29%
104	HCA (5)	20.5	6.86	60	6	14	70	0	4%	1%	1%	5%	0%	151	2%
105	MetLife (1) (c)	20.1	na	0	na	na	na	na	-	na	na	na	na	0	-
106	Kohl's (5)	19.7	56.19	256	115	23	15	3	69%	104%	10%	nm	3%	413	54%
107	Sprint FON Group (5)	19.4	8.62	169	482	4	0	0	4%	13%	0%	-	-	655	4%
108	Kroger (3)	19.4	23.70	107	111	335	na	na	5%	7%	29%	na	na	552	11%
109	Charles Schwab (5) (c)	19.2	57.53	578	713	198	85	40	80%	121%	57%	31%	17%	1,614	75%
110	Computer Associates Int'l (0)	19.1	-4.88	na	na	na	na	na	na	na	na	na	na	na	na
111	Tenet Healthcare (5)	18.9	16.60	95	3	10	86	52	5%	0%	2%	21%	13%	245	6%
112	Illinois Tool Works (3)	18.6	16.27	72	91	78	na	na	6%	9%	11%	na	na	240	8%
113	Alltel (5)	18.6	19.20	30	81	40	12	7	2%	5%	3%	2%	1%	170	3%
114	Costco Wholesale (5)	18.3	39.26	109	210	113	59	20	10%	22%	15%	10%	5%	511	14%
115	International Paper (3)	18.2	3.97	0	88	34	na	na	-	5%	2%	na	na	122	2%
116	SunTrust Banks (5) (c)	17.9	15.23	15	50	65	76	74	1%	4%	7%	11%	12%	280	6%
117	Waste Management (5)	17.8	8.05	0	75	101	160	85	-	4%	7%	35%	42%	421	7%
118	Sara Lee (5)	17.3	11.39	10	35	139	137	41	1%	2%	7%	9%	3%	361	5%
119	General Dynamics (3) (b)	17.3	24.12	93	105	168	na	na	9%	10%	30%	na	na	367	14%
120	Gannett (1)	17.2	17.18	26	na	na	na	na	5%	na	na	na	na	26	5%
121	Conoco (2)	17.0	na	20	5	na	na	na	1%	0%	na	na	na	25	0%
122	Sysco (5)	16.7	31.77	5	4	2	3	3	1%	1%	1%	1%	1%	16	1%
123	Southern Company (4)	16.7	11.96	5	0	4	0	na	0%	0%	0%	0%	na	10	0%

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Firm-by-Firm Estimates of Option Exercises, 1996-2000 (SEC Filings)

Rank	Company (a)	MV as of 11/6 ($bn)	Annualized Total Ret. (96-00)	Estimated Proceeds from Option Exercises ($mm)[1] 2000	1999	1998	1997	1996	Ratio of Option Exercises to Operating Cash Flow or Net Income[2] 2000	1999	1998	1997	1996	Cumulative 96-00[3] Exer.	Ratio
124	Mellon Financial (5) (c)	16.6	33.25	120	130	166	122	46	12%	14%	19%	16%	6%	584	13%
125	National City (5) (c)	16.5	16.03	18	102	166	116	59	1%	7%	16%	14%	8%	461	9%
126	PNC Financial Services (5) (c)	16.4	21.96	49	37	53	61	35	4%	3%	5%	6%	4%	234	4%
127	Caterpillar (5)	16.2	12.73	11	79	33	61	42	1%	3%	2%	3%	2%	226	2%
128	Maxim Integrated (5)	16.2	37.79	667	488	254	167	114	138%	159%	86%	89%	95%	1,690	121%
129	Compaq Computer (5)	16.1	9.64	392	310	702	531	247	69%	27%	109%	14%	7%	2,182	23%
130	Lehman Brothers (5) (c)	15.8	45.68	0	0	0	0	0	-	-	-	-	-	0	-
131	eBay (2)	15.6	na	273	229	849	na	na	272%	345%	nm	na	na	502	301%
132	State Street (4) (c)	15.4	42.00	49	15	16	3	na	8%	2%	4%	1%	na	84	4%
133	Analog Devices (5)	15.4	42.07	466	116	38	58	34	66%	27%	17%	19%	24%	712	40%
134	Williams Companies (5)	15.2	24.73	59	76	86	58	30	12%	5%	14%	6%	4%	307	7%
135	Dominion Resources (5)	15.2	17.25	17	0	0	0	0	1%	0%	0%	0%	0%	17	0%
136	Anadarko Petroleum (5)	15.0	21.91	131	9	8	4	12	9%	3%	3%	1%	4%	164	6%
137	Omnicom Group (5)	15.0	36.31	75	137	49	29	14	11%	15%	10%	6%	3%	305	10%
138	Phillips Petroleum (5)	14.8	14.13	27	21	15	24	24	1%	1%	1%	1%	1%	111	1%
139	H.J. Heinz (5)	14.8	10.78	40	20	99	227	82	8%	4%	11%	21%	9%	468	12%
140	Harley-Davidson (5)	14.4	41.37	90	41	30	17	11	16%	10%	9%	5%	5%	188	10%
141	Micron Technology (5)	14.4	12.41	208	256	85	36	42	10%	30%	45%	6%	4%	628	13%
142	BB&T (3) (b) (c)	14.2	26.47	40	71	96	na	na	6%	10%	15%	na	na	207	10%
143	American Electric Power (3) (b)	13.8	9.04	0	0	2	na	na	0%	0%	0%	na	na	2	0%
144	Concord EFS (3) (b)	13.7	39.40	12	24	5	na	na	4%	12%	3%	na	na	40	6%
145	Immunex (5)	13.6	96.83	437	135	16	2	0	254%	120%	70%	16%	nm	590	211%
146	Cendant (5)	13.5	-15.81	193	124	176	268	243	14%	4%	29%	26%	93%	1,005	16%
147	Forest Laboratories (5)	13.5	42.49	289	44	53	14	2	160%	26%	180%	15%	2%	403	66%
148	Hughes Electronics (5)	13.4	21.94	136	115	39	64	24	nm	44%	4%	nm	2%	378	17%
149	Nike (5)	13.3	10.91	61	44	73	96	77	9%	6%	8%	19%	21%	351	11%
150	Hartford Financial Svcs. (5) (c)	13.3	26.47	103	38	59	30	8	11%	4%	6%	2%	nm	237	6%

(1)   Measured as the excess of the market value of shares under exercised options over the proceeds from exercised options

(2)   The ratio of Estimated Proceeds from Option Exercises to operating cash flow (or net income for financial institutions)

(3)   The ratio of cumulative Estimated Proceeds from Option Exercises to cumulative operating cash flow (or net income for financial institutions), subject to the restriction that only years in which both numerator and denominator are available and meaningful are cumulated

(a)   Company name is followed by the number of years for which data is available (*n* for the cumulative ratio) and other applicable notes

(b)   Data was adjusted for a pooling transaction

(c)   Company categorized as financial institution

"na"   Data no available

"nm"   Data negative or otherwise not meaningful

**Appendix Table 2: Piecewise Linear Regression of Book Income on Taxable Income
with Fixed Effects, 1992-1994, 1995-1997, 1998-2000**

	Large Firms			Smaller Firms		
	1992-1994	**1995-1997**	**1998-2000**	**1992-1994**	**1995-1997**	**1998-2000**
Constant	2.8732	3.1591	4.9130	1.2284	2.5911	2.4912
	(0.6393)	(0.3822)	(0.4793)	(0.5974)	(0.3028)	(0.5018)
Spline 1	0.3012	0.3522	0.0490	0.6011	0.0452	0.2870
	(0.1824)	(0.0968)	(0.1158)	(0.3352)	(0.1698)	(0.2312)
Spline 2	0.9927	0.6141	1.5565	0.6959	0.4228	0.4171
	(0.3081)	(0.2270)	(0.2954)	(0.3366)	(0.2852)	(0.3233)
Spline 3	0.6429	0.7281	0.0752	0.9292	1.0640	1.0159
	(0.2836)	(0.2734)	(0.3658)	(0.4067)	(0.3225)	(0.6409)
Spline 4	1.4041	1.8022	1.6162	0.4234	0.5388	0.7951
	(0.3710)	(0.4426)	(0.4097)	(0.3130)	(0.3913)	(0.4861)
Spline 5	0.7528	0.4482	0.1918	1.5900	1.1378	0.9159
	(0.3151)	(0.2560)	(0.3287)	(0.5511)	(0.3559)	(0.5530)
Spline 6	0.7704	0.9410	1.4283	0.0218	0.5537	0.6787
	(0.2200)	(0.2260)	(0.3753)	(0.4228)	(0.4730)	(0.5287)
Spline 7	1.1020	0.8861	0.9643	1.6818	0.8137	1.1237
	(0.1968)	(0.1794)	(0.3438)	(0.3615)	(0.3774)	(0.6274)
Spline 8	1.0669	1.1465	0.5895	0.7891	1.0487	0.4403
	(0.2379)	(0.1810)	(0.1782)	(0.2509)	(0.2929)	(0.4185)
Spline 9	0.9043	0.9443	1.3070	0.7526	0.7264	1.5851
	(0.1074)	(0.0979)	(0.1176)	(0.1707)	(0.3218)	(0.3285)
Spline 10	1.0003	1.0504	0.9740	1.0203	1.0009	0.2469
	(0.0600)	(0.0477)	(0.0625)	(0.1258)	(0.0841)	(0.2822)
Adjusted R^2	0.8940	0.8900	0.8827	0.7626	0.7388	0.6694
# of Obs.	648	744	503	581	640	439
Categories Absorbed	57	56	55	57	57	54

Note: The dependent variable in all specifications is the logarithm of book income summed across relevant years. The percentile splines create separate coefficients depending on the logarithm of taxable income summed across relevant years.