

TEMPORARY DIFFERENCES, DEFERRED TAX POSITIONS, AND CORPORATE INCENTIVES

James Poterba
MIT and NBER

Nirupama Rao
MIT

Jeri Seidman
University of Texas at Austin

Revised January 2009

ABSTRACT

The recent widening of the gap between book and tax earnings has drawn attention to accounting for income taxes. Book-tax differences can arise from either “permanent” or “temporary” differences. Although the two have different implications for various tax policy issues, there has been little systematic analysis of their relative importance. We explore this issue by compiling data on deferred tax assets between 1993 and 2004 for a sample of large U.S. firms and find that temporary differences are frequently as important as, and sometimes more important than, permanent differences in generating the book-tax income gap. The growing book-tax gap in the late 1990s appears to reflect a combination of permanent tax reductions and temporary tax deferrals. We also find substantial heterogeneity in the size of deferred tax positions. While half of our sample firms report a deferred tax position of less than three percent of assets, approximately ten percent report a position in excess of ten percent of assets. For firms with large deferred tax positions, a change in the statutory corporate income tax rate may have substantial effects on net income as a result of the revaluation of these positions. We estimate that if the federal corporate tax rate had been reduced from 35 to 30 percent in 2004, the resulting deferred tax revaluation would have raised aggregate net income for U.S. corporations by about \$60 billion.

Keywords: book-tax differences; deferred tax; revaluation; tax policy

We are grateful to Melissa Andrews, Robert Brantley, Seema Kacker, Katherine Jackson and Ekaterina Pak for outstanding research assistance in collecting 10-K data entries, to James Hines, Richard Larsen, Thomas Neubig, Richard Sansing, Andrew Schmidt, Jake Thomas and especially Lillian Mills for helpful comments and discussion, and to the American Tax Policy Institute, the Bradley Foundation, and the National Science Foundation for research support.

1. INTRODUCTION

The substantial gap between aggregate book and tax earnings at various points in the last decade has attracted the interest of policy-makers as well as researchers in both accounting and economics. Hanlon and Shevlin (2005), the Joint Committee on Taxation (2006), and Mills and Plesko (2003) among others have documented the growth of book-tax differences and have tried to explain its source. Many studies of book tax-differences, such as Mills (1998), U.S. Department of Treasury (1999) and Desai (2005), attribute rising book-tax differences to an increase in the prevalence of aggressive corporate tax planning. Using a more detailed data set than previous studies, our paper suggests that at least part of the growth in book-tax differences can be attributed to more benign sources.

Virtually all of the previous research on book-tax differences has relied on a single, aggregate measure of each firm's book-tax gap, whether for descriptive purposes or as a basis for hypothesis testing. This approach neglects the substantial heterogeneity across firms in the factors that contribute to the differences between book and tax income. We depart from this pattern and examine the detailed components of book-tax differences for a sample of fifty of the largest U.S. firms between 1994 and 2004. These firms account for nearly forty percent of the aggregate market capitalization of the U.S. corporate sector.

Differences between book and tax income can arise from either permanent or temporary differences. Permanent differences are due to differences in the definition of income for book and tax purposes. Temporary differences, in contrast, are the result of differences in the timing of income recognition for book and tax purposes. Because temporary differences will eventually reverse, they give rise to balance sheet entries that reflect their cumulative value. A deferred tax

asset (DTA) measures taxes that have already been paid, but not accrued for accounting purposes, while a deferred tax liability (DTL) measures taxes that have been accrued for book purposes but not yet paid. Previous work has not explored the relative importance of temporary and permanent differences in contributing to the divergence between book and taxable income.

Our paper provides the first detailed analysis of the size and components of deferred tax positions for a significant sample of firms over an extended period of time. First, we document the important role of temporary differences in contributing to the book-tax gap. The median share of the book-tax gap attributable to temporary differences averages 73% during the period 1993 and 2004. Additionally, between 1993 and 2004, the fraction of firms in our sample with a net deferred tax liability rises substantially, indicating the growing prevalence of temporary differences. Key components of the increase in the net deferred tax liability include leases, property, plant, and equipment, and valuation allowances. Our data suggest that temporary differences, specifically those which give rise to deferred tax liabilities, are an important component of the book-tax gap.

Second, our data enable us to shed light on the extent to which the book-tax gap represents a permanent loss of tax revenue or a re-timing of revenue across tax reporting periods. A U.S. Department of Treasury report (1999) states that one indicator of a tax shelter is that “the arrangement is reasonably expected to create a “permanent difference” for U.S. financial reporting purposes under generally accepted accounting principles.” We find that approximately one quarter of the book-tax gap is attributable to permanent differences. This finding raises questions about whether the widening book-tax gap was primarily the result of more aggressive tax sheltering and suggests that other factors, such as the disparity between book and tax depreciation, were substantial contributors to the widening book-tax differences.

Finally, our results identify a transitional effect associated with corporate tax reform that could have significant effects on the reported net income for many firms. Net deferred tax liabilities, which correspond to a positive book-tax income gap, are more common and larger in our sample than net deferred tax assets, which indicate a negative book-tax income gap. This suggests that within our sample, more firms would report an increase in net income than a decrease from the revaluation of deferred tax assets if the statutory corporate tax rate were reduced. There is, however, substantial heterogeneity within our sample. We use our data to illustrate how revaluation of deferred tax positions associated with past temporary differences can affect tax expense. We find that reducing the statutory federal corporate income tax rate from 35 to 30 percent would result, for the average firm in our sample, in a \$343 million increase in reported net income as a result of revaluation of deferred tax positions. For some firms, however, with net deferred tax assets, the rate reduction would have the opposite effect. Current economic conditions will likely increase deferred tax assets related to NOL Carryforwards, increasing the number of firms relatively more sensitive to a corporate tax rate decrease. While the rate change would have many other effects on reported earnings as well, the revaluation of historic temporary differences is not an insignificant effect.

We use simple extrapolation procedures based on corporate sales and assets to generalize from our sample firms to the entire U.S. corporate sector. We estimate that in 2004 the aggregate net deferred tax position was a liability on the order of \$400 billion, and that the deferred tax revaluation caused by a five percent statutory corporate tax rate reduction would have raised aggregate net income in 2004 by about \$60 billion. Temporary differences thus appear significant both as a percentage of the book-tax income gap and in terms of their potential impact on net income.

We divide our analysis of temporary book-tax differences into six sections. The first explains how temporary differences generate deferred tax assets and liabilities. This background is particularly important for non-accountants involved in the design of tax policy. The next section describes the data set that we have assembled from a sample of SEC filings and identifies a number of potential data limitations. Section three presents summary statistics on the number of firms in our sample with DTAs and DTLs and on the total value of these deferred tax positions. It also disaggregates book-tax differences and reports the components due to investments in property, plant, and equipment, retiree health benefits, and other factors. Section four develops a simple algorithm for extrapolating from our sample to the aggregate U.S. corporate sector. The fifth section examines how the past cumulation of temporary differences can affect net income when tax policy changes induce revaluations. A brief conclusion explores implications for tax policy and suggests future research directions.

II. TEMPORARY DIFFERENCES BETWEEN BOOK AND TAX EARNINGS

Statement of Financial Accounting Standards 109 (SFAS 109), *Accounting for Income Taxes*, which took effect for fiscal years beginning after December 15, 1991, provides guidance for the calculation of tax expense. SFAS 109 uses a balance sheet approach to determine the income tax provision. Deferred tax expense is calculated as the change in the firm's net deferred tax position. To calculate the ending deferred tax position, temporary differences are cumulated over time and tax-effected using the current statutory tax rate. Temporary book-tax differences are the result of disparities in the timing of an income component's inclusion in book and tax earnings. When tax rates are constant through time, a firm's deferred tax expense equals the current statutory tax rate times temporary book-tax differences that arise in the current period.¹ When tax rates change, the balance sheet approach adopted in SFAS 109 requires revaluing net

deferred tax positions when rates change. The revaluation of the deferred tax asset or liability is then included in net income through the deferred tax expense.

While the balance sheet approach of SFAS 109 appears relatively complicated with regard to deferred taxes, in most instances the following simplification yields approximately the same result.² Total tax expense, which measures the taxes that will be due at some point in time on current period income, equals the statutory corporate tax rate times taxable book income, less tax credits and other rate adjustments. Taxable book income equals pre-tax book income less permanent differences between book and tax income. Permanent differences arise when a component of income enters one earnings measure but not the other. The exclusion of tax-exempt interest from taxable but not book income is an example. The effect of permanent differences on the firm's accounting earnings and cash flow is fully reflected in the year when these differences occur.

Permanent differences affect total tax expense, while temporary differences do not, but both permanent and temporary differences affect taxable income. Temporary book-tax differences arise when book and tax rules differ not on the treatment of an income component but on the timing of its inclusion in book and tax earnings. The difference between book and tax depreciation is an example. In the absence of revaluation, temporary differences do not affect net income. Rather, temporary differences affect the partition of total tax expense between current and deferred tax expense.

$$\text{Total Tax Expense} = \text{Current Tax Expense} + \text{Deferred Tax Expense}. \quad (1)$$

Temporary differences generate a current disparity between book and tax income, but they also generate future, opposite-signed effects on these two variables. Permanent differences, in contrast, have only current effects. Temporary differences affect earnings twice.

Deferred tax positions equal the current statutory corporate tax rate times the sum of temporary differences that will reverse in the future, which equals the historical sum of the firm's temporary differences:

$$\text{Deferred Tax Liability}_t = \tau_t * (\sum_i \text{Temporary Differences}_{t-i}). \quad (2)$$

Firms with a positive sum of temporary differences have a net deferred tax liability (DTL): they have not yet paid taxes on income that has been recorded for accounting purposes. Firms for which taxable income has exceeded book income, in contrast, have a deferred tax asset (DTA); they are entitled to future tax relief since they have already paid taxes on income that has not yet been reported for accounting purposes.

If a firm is in a steady state, with constant investment flows and other balance sheet items, temporary differences should not have any net effect on book income relative to taxable income. With regard to investment, for example, the reductions in taxable income relative to book income generated by recently-acquired assets subject to accelerated depreciation should offset the increases in taxable income relative to book income on older assets that have already been completely depreciated for tax purposes. When the economy is growing, however, or the firm experiences swings in investment from year to year, temporary differences associated with different vintages of investment will not be of equal magnitude so they may affect book relative to taxable income. When recent investments are larger than investments in earlier years, temporary differences may reduce taxable income relative to book income. Similar patterns could emerge as a result of other temporary components.

We study temporary differences by analyzing reported deferred tax positions. Three features of SFAS 109 that affect these reports are particularly significant for our study. First, firms must report both deferred tax assets and liabilities, not just a net deferred tax position.

Deferred tax positions are presented on the balance sheet based on a current/non-current classification, as determined by the current/non-current status of the underlying asset or liability that gave rise to the deferred tax position. Second, firms must adjust their reported DTAs and DTLs when laws change. Changes in statutory corporate tax rates, in particular, must be reflected. For many firms, and for many but not all components of deferred taxes, a reduction in the statutory corporate tax rate would reduce DTLs (DTAs) and thereby have a positive (negative) effect on reported earnings. Third, firms must report a valuation allowance that reflects the probability of realizing deferred tax assets. This permits an assessment of the potential tax benefit associated with a deferred tax asset.

While disaggregating deferred tax assets and liabilities makes it possible to study many issues that researchers could not previously examine using machine-readable information on net long-term deferred tax liabilities, we are aware of only three studies that have focused on the components of the deferred tax account.³ Chen and Schoderbek (2000) distinguish changes in deferred tax positions that were triggered by the 1993 corporate tax rate increase from other changes. They find that analysts reacted in roughly the same way to these and other changes, even though the persistence and predictive power of the two components is likely to be different. Givoly and Hayn (1992) study how share prices of firms with deferred tax liabilities reacted to the corporate tax rate reduction in the 1986 Tax Reform Act. They find that the decline in corporate rates had a favorable effect on firms with deferred tax liabilities. Finally, Amir, Kirschenheiter, and Willard (1997) disaggregate deferred taxes and find some evidence that market participants value deferred tax positions at a disaggregate level. We follow this approach to disaggregating deferred tax balances, but we focus on how deferred taxes affect the income statement rather than market values.

III. DATA COLLECTION AND LIMITATIONS

Machine-readable data, such as the deferred tax liability balance recorded by Compustat, measure firms' deferred tax positions with substantial noise. Until recently, the Compustat database only captured long-term deferred tax liabilities as reported on the balance sheet. It omitted deferred tax positions reported as assets or as short-term liabilities, thereby preventing researchers from identifying firms with net deferred tax assets or from accurately measuring the position of firms with net liabilities. Compustat's Fundamentals Annual database, introduced in 2007, collects and discloses data on net deferred tax positions as well as short term and long term deferred tax assets and liabilities. This dramatically improves the ability of researchers to measure the net deferred tax positions of firms, but it does not allow detailed component-style analysis these positions. In addition, no data are presently available prior to 2004.

To overcome these limitations of machine-readable sources of data on deferred tax positions, we collect data from the tax footnote in 10-K filings for FORTUNE 50 firms for fiscal years between 1993 and 2004. Our sample begins in FY 1993 because it is the first year when all firms' financial statements were prepared in accordance with SFAS 109. FORTUNE ranks firms by gross revenue.⁴ Our sample includes both financial and non-financial firms. Since we are interested in tracking deferred tax positions over time, we use the annual FORTUNE 50 lists to construct a panel data set. For any firm in the FORTUNE 50 in any year of our sample, we collect data for the entire sample period. There is moderate turnover in the FORTUNE 50. Only 25 of the firms in the 1995 FORTUNE 50 were in the 2004 FORTUNE 50. Nine of the 50 firms on the 1995 list were acquired between 1995 and 2004. In a typical year, five firms leave the FORTUNE 50 for various reasons. One hundred firms appear in the FORTUNE 50 at least once between 1995 and 2004. We drop four firms from this group: State Farm Insurance and TIAA-

CREF, which are private companies that do not need to file 10-Ks, and Fannie Mae and Freddie Mac, which are government-sponsored enterprises. This leaves a sample of ninety-six firms.

Corporate control transactions complicate the problem of tracking FORTUNE 50 firms through time. Sample firms acquire other firms, or in some cases are themselves acquired. When this occurs we collect data on the acquired or acquiring firm for years prior to the acquisition. To preserve data comparability over time, we create what we label as “super-firms” by combining the distinct accounts of the two firms that subsequently consolidated. This process is designed to eliminate discrete changes in deferred tax positions that are due to acquisitions.

Because most of the companies acquired by FORTUNE 50 firms are companies that are not part of the FORTUNE 50, constructing super-firms involves data collection on many small firms. This increases the number of firms in our sample for at least one year to 406; these firms combine to create 82 super-firms. Due both to limited availability of electronic filings in the early years of our sample and to the non-traded nature of some firms, the number of super-firms in our sample rises from 72 in the first year (1993) to 79 in the final year (2004). Appendix A lists our sample firms. In our analysis of deferred tax positions, we use super-firms rather than individual companies as our units of observation to preserve comparability across years.

SFAS 109 mandates the following disclosures: (i) an income tax summary, which details the significant components of income tax expense; (ii) a rate reconciliation, which reconciles reported income tax expense with the amount that would result from applying the domestic federal statutory rate to pretax income; and (iii) a schedule of deferred tax positions, which provides information about DTAs and DTLs. Firms also are expected to disclose information regarding the amounts and expiration dates of loss and credit carry-forwards, the division of tax expense between continuing operations and all other items, the composition between domestic

and foreign earnings before income taxes, and temporary differences for which the firm has not recorded a deferred tax liability, including permanently reinvested foreign earnings.

We collect the tax summary, rate reconciliation, and schedule of deferred tax positions from tax footnotes. There is substantial variation across firms in the level of detail presented in the tax footnote, although most firms follow a fairly stable reporting policy from year to year. Appendix B describes our procedure for disaggregating DTAs and DTLs into their component parts. We match each firm-year observation with Compustat using both firm name and year, and validate the match using total assets and net income.⁵

IV. SUMMARY FINDINGS

Table 1 presents summary information on our sample: the number of firms we study in each year, their total market value and the aggregate gap between their book and tax income. Similar to the world-wide tax-to-book ratio developed in Lev and Nissim (2004), we define the book-tax income gap on a world-wide basis as Pre-Tax Income less estimated Taxable Income, where Taxable Income is defined as Current Tax Expense divided by the maximum U.S. corporate statutory tax rate (35% throughout our sample). The trend in the aggregate book-tax income gap in the early part of our sample resembles that for the aggregate corporate sector reported in Desai (2003).

[insert Table 1 around here]

The last four columns in Table 1 show the number of firms in each sample-year that report net deferred tax assets, the number that report net deferred tax liabilities, and the total value of these net deferred tax positions. The data demonstrate the heterogeneity in firm tax positions, as well as the evolution of these positions through time. In 1993, 31 super-firms report net deferred tax assets that total \$52.2 billion, while 41 report net deferred tax liabilities totaling

\$75.6 billion. The proportion of net DTL firms increases through our sample period, and in 2004, 28 of 79 super-firms report net DTAs, while 51 report net DTLs.

The data in Table 1 suggest that the proportion of firms with a net DTL rose during our sample period. In addition, firms with a net DTL have larger deferred tax positions than firms with a DTA. The average net DTL is \$1.8 billion in 1993 while the average net DTA is \$1.7 billion; the average net DTL is \$4.4 billion in 2004 while the average net DTA is \$2.5 billion. The average net DTL increases 140 percent during our sample, while the average net DTA increases by 46 percent.

Table 2 reports the median, mean, and aggregate book-tax income gap for our super-firm sample as well as the median, mean and aggregate share of the estimated book-tax income gap attributable to temporary differences. We calculate temporary differences as deferred tax expense divided by the maximum corporate statutory tax rate. For the median firm in our sample, the share of the imputed book-tax difference attributable to temporary differences varies across years, but in every year temporary differences comprise the majority of this difference. The mean share attributable to temporary differences moves erratically across years. It often exceeds one hundred percent or falls below zero, reflecting the fact that temporary and permanent differences are sometimes of opposite sign.

[insert Table 2 around here]

The greater variance of the mean rather than the median share attributable to temporary differences is in part driven by the increased variance in the mean versus median book-tax income gap. When the denominator in this ratio, the total book tax gap, is relatively small, and the temporary and permanent differences are of opposite signs, the shares can move widely. For example, the relatively high mean share in 1995 is driven by the super-firms AMR and Amoco.

These firms report temporary shares of 7859% and 12702%, respectively. The AMR case illustrates the source of these extraordinary values. AMR reports very small federal tax expense in 1995 (\$50 million) compared with every other year in our sample (\$292 million on average). However, the book-tax income gap for AMR in 1995 is less than \$2 million, relative to an approximate average gap of \$830 million for all other years in the sample. Therefore, the very large share attributable to temporary difference in 1995 is not driven by large permanent or temporary differences in 1995 but rather by the fact that these temporary and permanent differences nearly offset, resulting in a very small book-tax income gap for 1995.

Because the average of ratios can be very sensitive to outlying values, we also compute the ratio of the sum of temporary differences across firms and the sum of book-tax differences across firms. This approach reduces the problem of dividing by values near zero, but it introduces other problems. Firms with large book-tax gaps or large temporary differences are more influential in this measure. The sixth and seventh columns of Table 2 report the values of this aggregate measure. From year to year the aggregate ratio is more stable than the mean ratio but less stable than the median ratio. Whether calculated at the firm-level or in the aggregate, the results in Table 2 demonstrate that temporary differences are the most significant component of the book-tax income gap for firms in our sample.

Tables 3 and 4 explore the increases in temporary differences that have contributed to the rise in the book-tax income gap and present detailed information on the composition of deferred tax positions. Table 3 disaggregates deferred tax positions into their constituent components, and indicates the sources of the most important temporary book-tax differences. Table 4 separates DTA positions from DTL positions for components that do not consist almost

exclusively of either assets or liabilities. Average firm amounts facilitate comparison across years with different sample sizes, although they are sensitive to the set of firms in the sample.

[insert Table 3 around here]

The results in Table 3 suggest some variation over time in the key sources of deferred tax positions within our sample. The most important source of deferred tax liabilities throughout the sample was “property.” Early in the sample, the most important source of deferred tax assets, other than unclassifiable deferred tax positions, was “benefits,” which includes benefits related to current employees as well as retiree health benefits and pensions. This is not a surprise, because our sample begins in 1993 shortly after SFAS 105, *Accounting for Other Postretirement Benefits*, required firms to record liabilities for unfunded retiree medical costs. In the following decade, many companies eliminated or scaled back such coverage, thereby decreasing the “benefits” DTA values. By the end of the sample in 2004, “credits and carryforwards” replace “benefits” as the most significant deferred tax asset, while “benefits” remains a major contributor. Although the economy had substantially recovered, many firms in 2004 may have had unused loss and credit carryforwards from the dot.com bust and the post-9/11 recession.

While the overall ranking of various categories does not change dramatically between 1993 and 2004, the magnitude of certain categories does. For example, deferred tax positions related to mark-to-market adjustments rise and fall with the general equity market. Tax Credits and Other Carryforwards increase 245 percent while NOL Carryforwards increase 175 percent, consistent with the extension of the carryforward period under the Taxpayer Relief Act of 1997. The deferred tax liabilities related to property increase 60 percent. Possible explanations for the rise in “property” are special “bonus tax depreciation” effective beginning in 2001 as well as the implementation of SFAS 142, which removed book amortization of intangible assets. The data

in Table 3 suggest that the increase in temporary differences that contributed to the rise in the book-tax income gap was not driven by a particular category, but by increases in many deferred tax liabilities including Property, Subsidiary-Related Items and Valuation Allowance (the latter being a contra-asset).⁶

Table 4 separates deferred tax assets from liabilities for components that include substantial assets as well as liabilities. Some categories, such as “revenue related,” appear relatively small in Table 3 when the net deferred tax positions are presented, but represent a significant deferred tax asset for some firms and a significant liability for others. For example, a firm that received cash and paid income tax on that cash, but did not record the cash as revenue until the associated goods or services were delivered, would have an unearned revenue liability and a corresponding deferred tax asset. A firm with installment sales, for which it recognizes a gain for book purposes when the sale closed but recognizes the gain for tax purposes as the payments are received, would have a deferred tax liability. Table 4 presents additional information that may be helpful in understanding the contribution of temporary differences to the increase in the book-tax income gap.

[insert Table 4 around here]

Table 5 reports the distribution of net deferred tax assets or liabilities as a share of firm assets for each super-firm and for each individual firm. The net deferred tax balance is substantial for many firms. In 2002, for example, 35 percent of both the super-firms and the individual firms in our sample reported a net deferred tax position in excess of five percent of assets. Although the table does not show it, approximately ten percent of both individual firms and super-firms had a net deferred tax position exceeding ten percent of assets. For super-firms, the maximum (minimum) net deferred tax asset as a function of assets occurred in 2004 (1995)

and was 14.5 percent (-31.9 percent). Overall, Table 5 suggests that while the majority of firms have a small deferred tax position relative to total assets, a nontrivial number have a much more significant position.

[insert Table 5 around here]

Table 6 presents information similar to that in Table 5, but it distinguishes financial and non-financial firms. Financial firms have relatively smaller deferred tax positions than non-financial firms, in part because their base of financial assets is so large, and in part because they have fewer hard assets that generate book-tax differences such as depreciation. In every sample year, at least 80 percent of the financial firms have a net deferred tax position, either positive or negative, that represents less than three percent of total assets. For non-financial firms, in contrast, about half of the firms have deferred tax assets in this range. The extreme values of the ratio of deferred tax assets to firm assets are also smaller for financial than for non-financial firms. The maximum (minimum) Net DTA/Assets for a financial firm occurred in 1994 (2000) and was 16.2 percent (-7.9 percent) while the maximum (minimum) Net DTA/Assets for a non-financial firm occurred in 2001 (1995) and was 48.0 percent (-46.3 percent). Though there is not a significant difference in the percentage of financial and non-financial firms that have a net DTA or a net DTL position, the net deferred tax assets for financial firms are distributed more tightly around zero than are the comparable assets for non-financial firms.

[insert Table 6 around here]

V. EXTRAPOLATING SAMPLE VALUES TO ECONOMY-WIDE AGGREGATES

Although our sample firms represent a very small fraction of all firms in the United States, they account for over forty percent of the assets in the Compustat universe in 2004. To more formally link our estimates to economy-wide measures, we extrapolate our summary

statistics to the aggregate U.S. corporate sector. We do this in two ways. First, we simply gross up our sample's DTA and DTL aggregates by the ratio of an economy-wide aggregate, such as assets, to the corresponding aggregate for our sample. Second, we extrapolate using industry-level multipliers based on the ratio of Compustat total assets to sample total assets in each two-digit SIC industry.

We illustrate our first procedure, and then present results from both extrapolation algorithms. If the deferred tax position of firm i in year t is D_{it} , and the firm's net assets are A_{it} , the total deferred tax assets of our sample firms equals $D_{*t} = \sum_i D_{it}$ and their total assets equal $A_{*t} = \sum_i A_{it}$. Assuming deferred tax assets as a share of corporate net assets are similar for firms throughout the size distribution, we can estimate the total stock of deferred tax assets ($D_{tot,t}^*$) as

$$D_{tot,t}^* = (A_{tot,t}/A_{*t}) * D_{*t} \quad (3a)$$

with $A_{tot,t}$ denoting the total assets, which we estimate from Compustat. When we extrapolate using industry-level information, we replace (3a) with

$$D_{tot,t}^* = \sum_{j=1,N} (A_{tot,j,t}/A_{*j,t}) * D_{*j,t} \quad (3b)$$

where subscript j varies over industries, and $D_{*j,t} = \sum_{i \in j} D_{it}$ denotes the sum of deferred tax positions for firms within an industry.

One potential difficulty with the disaggregate extrapolation approach in (3b) is that the industry-specific multipliers, $(A_{tot,j,t}/A_{*j,t})$, may be very large for some industries in which our sample includes very few firms. Fortunately, approximately ninety percent of the gross deferred tax assets and liabilities in our sample are in industries with multipliers below five. In most sample years, roughly one quarter of the 2-digit SIC code industries are represented by only a single firm. In 2004 the total assets of the firms in our sample represented 42.6 percent of the total assets of firms in the Compustat universe. In five 2-digit SIC industries, oil and gas

extraction (29.1 for assets, 19.9 for sales), rubber and miscellaneous plastics products (17.6, 21.8), primary metal industries (10.3, 8.7), wholesale trade – durable goods (13.4, 8.0) and educational services (17.9, 15.2), the multiplier used exceeds 10 in 2004. These industries comprise \$47.3 billion of extrapolated economy-wide gross DTA and \$68.4 billion of extrapolated economy-wide gross DTL. These high-multiplier industries account for 1.8% of total assets in the 2004 Compustat universe.

A second potential problem is that the large firms in our sample may not be representative of smaller firms that populate the broader economy. This could occur if the large firms in most industries are more diversified, and less likely to experience tax losses, than smaller ones. It is also possible that large firms engage in more corporate control transactions than smaller firms, thereby inducing different levels of goodwill and deferred tax assets than one finds at smaller firms. However, we do not observe large differences in net or gross deferred tax positions relative to firm assets for firms in our sample of different size.

Table 7 shows the results of our asset-based extrapolation procedure for gross and net deferred tax positions, which suggest that for the U.S. corporate sector as a whole, net deferred tax liability positions could total more than \$350 billion in 2004. For each sample year, our estimate of the aggregate value of gross deferred tax liabilities exceeds our estimate of the value of gross deferred tax assets. Additionally, the disparity between gross DTAs and gross DTLs rises during our sample. By 2004, we estimate gross deferred tax liabilities that are roughly forty percent larger than gross deferred tax assets.

[insert Table 7 around here]

When interpreting estimates of aggregate deferred tax assets or liabilities, it is important to remember that while large gross DTA and DTL positions offset each other for the corporate

sector as a whole, these positions may loom large for individual firms. Our extrapolation for 2004 suggests gross deferred tax assets of more than \$850 billion and gross deferred tax liabilities of more than \$1200 billion. Our estimate of the aggregate net DTL in 2004, the sum of these two gross figures, is roughly \$350 billion.

VI. THE NET INCOME IMPACT OF DEFERRED TAX POSITIONS

Deferred tax positions affect cash flow in the period when they are recorded, but they also affect cash flow, and potentially net income, in future periods. These future-period effects occur in two ways. First, and most straightforward, upon their reversal, temporary differences affect deferred tax expense and therefore cash flow by changing the allocation between current and deferred tax expense. Second, in the event of a revaluation, deferred taxes affect net income. We illustrate this with a hypothetical example in which the federal corporate income tax rate is reduced by five percentage points. Many other changes in the business environment, including changes in GAAP, could also affect deferred tax positions.

A Corporate Tax Rate Reduction

Using the data in Tables 1 and 2, we can estimate the revaluation of beginning-of-year deferred tax positions that would occur because these positions must be valued using the prevailing statutory corporate tax rate. Our results, presented in Table 8, suggest that a lower tax rate reduces federal tax expense on current period income and increases the period's Net Income; we refer to this as its "direct effect." If the 2004 corporate tax rate had been reduced to 30 percent, the direct effect would have reduced federal tax expense by \$145 million for the average super-firm.⁷ The average super-firm's net income in 2004 was \$3,866 million, so this reduction in tax expense represents an increase in net income of 3.8 percent. In the year of the rate change both a direct effect and a revaluation effect will occur; only the direct effect persists.

[insert Table 8 around here]

While we might expect the deferred tax revaluation to be second-order, it is considerably larger than the direct effect of the statutory rate change. Our estimates suggest that for the average super-firm, the revaluation of 2003 deferred tax positions would have increased Net Income by \$343 million, or 8.9 percent. Our average super-firm would experience a 12.6 percent increase in Net Income —two-thirds of which is attributable to the revaluation effect.

While a reduction in the tax rate would have increased the average super-firm's Net Income, the effect is not uniform across firms. For Net DTA firms the write-down of Net DTA decreases Net Income, offsetting the positive Net Income effect of the reduction in the current period's tax expense. Net DTL firms, on the other hand, reduce the value of a balance sheet liability; revaluing deferred tax positions increases their Net Income. Net DTA super-firms in our sample would on average experience a \$295 million decrease in net DTA and Net Income; the lower tax rate would have decreased their current tax expense and increased their Net Income by \$103 million. On net, these firms would report a \$192 million earnings decrease due to the rate change, a 9.4 percent decrease in their average net income of \$3,211 million. Firms in our sample with a net DTL would experience, on average, a \$682 million dollar decrease in their net DTL, and a matching Net Income increase. They would report \$167 million less in taxes on income generated in the current period. DTL firms average \$4,225 million of net income in 2004. For net DTL firms the revaluation effect reinforces the direct tax expense effect. Net Income rises, on average, by 20 percent for our sample firms with a net DTL.

Our extrapolations offer some insight on the potential impact of a change in statutory corporate tax rates on deferred tax positions and the resulting effect through this channel on the aggregate earnings of the U.S. corporate sector. Our most conservative extrapolation, that based

on equation (3b), yields an economy-wide estimate of corporate net deferred tax liabilities of \$302 billion in 2003 (Table 7, column 15).⁸ In this case a five percentage point corporate rate cut, from 35 to 30 percent, would reduce the aggregate net deferred tax positions by \$60 billion, which in turn would increase reported earnings in the year of the tax rate reduction. Net income for all domestic, non-subsidary firms in Compustat was \$818 billion in 2004, which suggests that a five percentage point drop in the rate in 2004 would have increased net income by more than seven percent. Using the same extrapolation procedure, we project aggregate federal tax expense for 2004 of \$195 billion.⁹ Had this expense been calculated using a statutory rate of 30 instead of 35 percent, it would have been \$167 billion, a decline of \$28 billion. This calculation suggests that at least in the year of a corporate income tax rate change, the effect of DTA revaluations on reported after-tax earnings can be of the same order of magnitude as the effect of the rate reduction on current-period tax expense.

Averages mask differing effects for net DTA and net DTL firms. Economy-wide, net DTA firms would experience a \$6 billion increase in Net Income due to the decline in taxes on current period income; revaluation of their deferred tax assets would cause a \$19 billion decrease in their aggregate Net Income. Net DTL firms would enjoy a \$79 billion increase in Net Income due to DTL revaluation as well as a \$21 billion decrease in current period taxes. A five percentage point corporate tax rate reduction would decrease net DTA firm earnings by \$13 billion and increase net DTL firm earnings by \$100 billion.

Deferred Taxes and Corporate Incentives to Lobby for Tax Policy Changes

The foregoing statistics make clear that firms with DTAs are distinct from those with DTLs. This is important for understanding how deferred tax positions may affect firms' incentives to lobby for particular tax reforms or to support existing policies. Neubig (2006) and

Mills (2006) argue that firms are very sensitive to the impact of tax reform on their reported earnings. Both recognize the potential income effects through the revaluation of DTAs and DTLs. Our findings suggest that these effects can be substantial for some firms, and that there is substantial heterogeneity across firms in their exposure to deferred tax asset revaluations. Firms with net deferred tax assets may lobby against rate cuts, for example, and firms with net deferred tax liabilities may lobby against rate increases, particularly if they are primarily concerned with the short-term effect of such policy changes on reported after-tax income.

The political history of tax policy changes is replete with examples of corporate groups with closely-aligned incentives affecting policy design. Corporate pressure from firms with accumulated net operating losses was one factor in Congress' decision, as part of the American Jobs Creation Act of 2004 (AJCA), to replace the extraterritorial income export incentive with a "qualified production activities" deduction rather than a reduction in corporate tax rates. For firms with large net deferred tax assets positions, a rate cut would have generated substantial tax expense. Less than two months after the passage of AJCA, the Financial Accounting Standards Board (FASB) published its interpretation of the qualified production activities deduction as a special deduction, rather than a tax rate reduction, under SFAS 109. While firms with deferred tax liabilities would have preferred FASB treat the new qualified production activities deduction as a tax rate reduction, FASB's treatment of it as a special deduction instead is additional evidence that firms are concerned about the financial statement impact of tax rate changes.

A recent corporate tax reform in Ohio illustrates how firms with substantial deferred tax positions may affect the tax legislative process. The reform legislation included three distinct forms of transition relief for firms that would lose deferred tax assets when the corporate income tax was replaced by a gross receipts tax. First, firms operating in Ohio under the income tax

regime were encouraged to schedule the reversal of their temporary differences during the phase-out of the corporate income tax. To the extent that any temporary items would not reverse by the end of the phase-out, an adjustment for the estimated deferred tax position at the end of the transition period was recognized in income in the period in which the phase-out began. Second, certain deferred tax assets, primarily research and development tax credits, were retained as credits under the new activity tax regime. These credits are not recorded as assets on the financial books of the firm, however, because SFAS 109 applies only to taxes on income. Finally, there was special transition tax relief aimed at those firms with large NOL carryforwards, who would lose the ability to use these assets under the new tax regime. These policies together provide transition relief to firms that were ‘owed’ tax relief in the future under the income tax regime, and that lost this prospective tax relief as a result of the tax reform.

Limitations

Several data limitations suggest caution in interpreting our estimates of revaluation effects, not just for the aggregate corporate sector but for individual firms as well. First, SFAS 109 is a world-wide consolidated firm disclosure. Most firms are taxed in multiple jurisdictions, but they do not disaggregate income tax disclosures by jurisdiction. Most firms consolidate foreign and domestic tax accounts, as well as state, local, and federal tax accounts within the United States. This makes it difficult to determine how changes in U.S. federal statutory tax rates alone would impact the reported DTAs and DTLs. Rather than attempt to disaggregate these different jurisdictions using an arbitrary method, we assume that all DTAs and DTLs relate to federal temporary differences.

Second, not all DTAs and DTLs are affected by statutory rate changes. Tax credit carryforwards, for example, are not affected by rate changes because they are credits not deductions.

We address this concern by separating credits from other carry-forwards where possible. We make the conservative assumption that any disclosure which includes credits, such as “Net Operating Loss and Credit Carry-forwards or Tax Carry-forwards,” is comprised entirely of credits. In 2003, credit carry-forwards including foreign tax credit carry-forwards average \$551 million per sample firm, or almost 60 percent of the total carry-forward category. When we estimate the revaluation effect of a tax rate change, credits are removed from the base deferred tax positions which would be revalued.

Third, we assume that changes in DTAs and DTLs will affect net income. There are at least two instances where this will not be the case. Mark-to-market adjustments for available-for-sale (AFS) securities will affect Other Comprehensive Income rather than Net Income. Changes to purchased DTAs and DTLs will affect Goodwill rather than Net Income. This assumption will not affect our estimates of the change in the DTA or DTL but will cause us to overestimate the effect of such a change on Net Income. While we do not often have information about purchased DTAs and DTLs, firms do sometimes disclose deferred tax positions related to AFS securities separately. Where possible, we separate AFS securities from other items marked-to-market. Disclosed AFS securities are a very small proportion of total mark-to-market deferred tax positions. Net deferred tax positions related to AFS securities average \$6 million per firm in 2003; net deferred tax positions related to total mark-to-market securities average -\$298 million. When we estimate the revaluation effect of a tax rate change, AFS securities are removed from the base deferred tax positions which would be revalued.

Finally, there may be heterogeneity across firms in the auxiliary assumptions that are used to compute and present the value of DTAs and DTLs. These differences may lead a statutory tax change to have different impacts on different firms. We do not have any

information regarding the detailed calculations underlying the tax footnotes, so we are unable to address such potential heterogeneity.

VII. CONCLUSION

This paper explores the role of temporary differences in contributing to the disparity between book and tax earnings for large U.S. corporations. Temporary differences comprise a substantial fraction of the book-tax gap. They not only contribute to the book-tax difference in the period they are recorded, but they also result in an equal-signed but opposite contribution to the book-tax disparity in some future year. Temporary differences that increase the book-tax income gap are larger than those that decrease it in our sample of large U.S. firms. More than half of the firms in our sample have a net deferred tax liability, which reflects the accumulation of past excesses of book income over taxable income. Additionally, the average net deferred tax liability position is greater than the average net deferred tax asset position.

The growth in net deferred tax positions during our sample is consistent with the increasing reliance on fair value GAAP accounting. Proponents of fair value accounting believe that a focus on relevance, including market prices for assets and liabilities, will increase the information content of accounting reports. In fact, FASB states in their summary of SFAS 159, which permits entities to choose to measure additional items at fair value:

The objective is to improve financial reporting...This Statement is expected to expand the use of fair value measurement, which is consistent with the Board's long-term measurement objectives for accounting for financial instruments.

The current IFRS-convergence project and planned IFRS-adoption are further examples of an increased U.S. reliance on fair value financial accounting.

The tax code has not followed GAAP in moving toward fair value accounting, remaining instead with a cash-basis, transaction-driven framework. In some cases, this difference has generated sharp increases in book-tax differences. For example, deferred tax liabilities based on

SFAS 115, which allows marking-to-market for securities when firms have particular intentions for those securities, nearly tripled between 1993 and 2004. SFAS 123R, which requires expensing of stock options when they are granted using estimates of their value generated by financial models, seems likely to result in a sharp increase in deferred tax positions related to employee benefits. Temporary book-tax differences are expected to become increasingly important in the future as growing reliance on fair value accounting exacerbates the revenue and expense recognition differences between book and taxable income.

While the average firm in our sample records a fairly small net deferred tax liability, firms exhibit substantial heterogeneity in their deferred tax positions. In 2004, more than forty percent of the firms in our sample of FORTUNE 50 companies reported a net deferred tax position valued at more than five percent of corporate assets. Financial firms exhibit less heterogeneity than non-financial service firms with only ten percent of the financial firms in our sample reporting a net deferred tax position more than five percent of assets. This heterogeneity shows that deferred tax positions are considerable for a large sub-set of firms. It also suggests that firms may have significantly different incentives regarding tax and financial reforms depending on whether they have a large deferred tax asset position, a large deferred tax liability position or a small deferred tax position.

Using our information on deferred tax positions, we estimate the net income effects of a five percentage point reduction in the corporate tax rate in 2004. We find that the average firm in our sample would experience a \$343 million increase in net income, but that the average revaluation effect for a firm with a net deferred tax asset position is a \$295 million decrease in net income while the average revaluation effect for a firm with a net deferred tax liability

position is a \$682 million increase. This simple exercise demonstrates that deferred tax positions can induce substantial heterogeneity across firms in the effects of particular tax policies.

Our descriptive findings suggest a number of possibilities for future research. They raise the important question of how firms respond to the incentives created by deferred tax assets and liabilities. The detailed information on tax accounts that we have collected may provide a starting point for other studies on the interplay between financial accounting for taxes and various aspects of corporate behavior. Mattozzi (2005) and Knight (2007) study patterns of corporate campaign contributions in the 2000 United States presidential election, and discover that firms whose stock prices rise with a candidate's probability of victory are more likely to contribute to that candidate. Information on tax burdens associated with various tax policy changes could be used to study lobbying efforts or campaign giving to explore related issues in the tax area. Information on the components of deferred tax assets and liabilities offers valuable insights into diverse issues including the importance of investments in assets that qualify for more favorable tax depreciation than book depreciation and the significance of accruals for post-employment benefits. We hope to explore some of these issues in future work.

Notes

¹ Under SFAS 109, temporary differences are recorded at their full tax-effect and are not discounted to reflect any timing considerations.

² In certain instances, this simplification does not hold. These include but are not limited to periods when the statutory rate changes or merger activity occurs.

³ Several studies analyze a portion of the deferred taxes. For example, Miller and Skinner (1998) and Bauman et al.(2001) study the valuation allowance related to deferred tax assets,

⁴ Prior to 1995, Fortune rankings included only manufacturing firms. To avoid including firms that are only included in the Fortune 50 due to the exclusion of non-manufacturing firms, we formed our sample using the Fortune rankings from 1995-2004.

⁵ We collected tax information from the first 10-K or annual report filing for each fiscal year. Restatements may cause differences between the total assets and net income entries in the 10-K and those reported in Compustat. We hand-checked the 47 firm-years where neither DATA6 nor DATA172 corresponded to our hand-collected total assets and net income numbers. The majority of differences were due to restatements. We dropped 39 firm-years for which Compustat did not have data or where a stub year caused a mismatch.

⁶ Corporate control activity may confound the interpretation of changes in deferred tax positions. Mergers and acquisitions change a firm's size as well as the significance and composition of its deferred tax positions. We try to address this concern by analyzing deferred tax positions at the super-firm level, but we cannot eliminate it, especially since merger and acquisition activity can itself affect deferred tax positions.

⁷ Since we are examining a federal tax rate change, we limit the sample to just those firms that report federal income tax expense separately. This limited sample includes 80.9 percent of our

firm-year observations, representing 88.8 percent of sample adjusted net deferred tax positions.

The revaluation calculations excludes deferred tax positions related to tax credits, including foreign tax credits, as well as available-for-sale (AFS) securities. Because credits directly offset tax liability, rather than taxable income, a rate change will not affect their valuation. The effect of a rate change on AFS securities will flow through Other Comprehensive Income rather than through Net Income.

⁸ Extrapolation on the limited sample of adjusted net deferred tax positions yields an estimate of aggregate corporate net DTL of \$423 billion rather than \$302 billion.

⁹ Extrapolations using sales multipliers suggest an aggregate federal tax expense of \$188 billion.

References

- Amir, E., M. Kirschenheiter and K. Willard, 1997, "The Valuation of Deferred Taxes," *Contemporary Accounting Research* 14(4): 597-622.
- Bauman, C. C., M. P. Bauman and R. F Halsey, 2001, "Do Firms Use the Deferred Tax Asset Valuation Allowance to Manage Earnings?" *Journal of American Taxation Association* 23(S-1): 27-48.
- Chen, K. C. W. and M. P. Schoderbek, 2000, "The 1993 Tax Rate Increase and Deferred Tax Adjustments: A Test of Functional Fixation," *Journal of Accounting Research* 38(1): 23-44.
- Cloyd, C. B., 1995, "The Effects of Financial Accounting Conformity on Recommendations of Tax Preparers," *The Journal of the American Taxation Association* 17(2): 50-70.
- Cloyd, C. B., J. Pratt and T. Stock, 1996, "The Use of Financial Accounting Choice to Support Aggressive Tax Positions: Public and Private Firms," *Journal of Accounting Research* 34(1): 23-43.
- Desai, M. A., 2003, "The Divergence between Book and Tax Income," in *Tax Policy and the Economy* 17(1): 169-206 (ed. J. Poterba).
- Desai, M. A., 2005, "The Degradation of Corporate Profits," *Journal of Economic Perspectives* 19(4): 171-192.
- Financial Accounting Standards Board, 2004. "FASB Staff Position No. FAS 109-1: Application of FASB Statement No. 109, *Accounting for Income Taxes*, to the Tax Deduction on Qualified Production Activities Provided by the American Jobs Creation Act of 2004."
- Givoly, D. and C. Hayn, 1992, "The Valuation of Deferred Tax Liability: Evidence from the Stock Market," *Accounting Review* 67(2): 394-410.
- Guenther, D. A. and R. C. Sansing, 2000, "Valuation of the Firm in the Presence of Temporary Book-Tax Differences: The Role of Deferred Tax Assets and Liabilities," *The Accounting Review* 75(1): 1-12.
- Hanlon, M., 2005, "The Persistence and Pricing of Earnings, Accruals, and Cash Flows When Firms Have Large Book-Tax Differences," *The Accounting Review* 80(1): 137-166.
- Hanlon, M., E. L. Maydew and T. Shevlin, 2006, "Book Tax Conformity and the Information Content of Earnings," University of Michigan working paper.
- Hanlon, M. and T. Shevlin, 2005, "Book-Tax Conformity for Corporate Income: An Introduction to the Issues," in *Tax Policy and the Economy* 19(1): 101-134 (ed. J. Poterba).

- Knight, B., 2007, "Are Political Platforms Capitalized Into Equity Prices? Evidence from the Bush-Gore 2000 Presidential Election," *Journal of Public Economics* 91(1-2): 389-409.
- Lev, B. and D. Nissim, 2004, "Taxable Income, Future Earnings, and Equity Values," *The Accounting Review* 79(4): 1039-1074.
- Mattozzi, A., 2005, "Can We Insure Against Political Uncertainty? Evidence from the U.S. Stock Market," California Institute of Technology working paper.
- Miller, G. S. and D. J. Skinner, 1998, "Determinants of the Valuation Allowance for Deferred Tax Assets Under SFAS No. 109," *The Accounting Review* 73(2): 213-233.
- Mills, L., 1998, "Book-Tax Differences and Internal Revenue Service Adjustments," *Journal of Accounting Research* 36(2): 343-356.
- Mills, L., 2006, "Five Things Economists and Lawyers can Learn from Accountants: An Illustration using the Domestic Production Activities Deduction," *National Tax Journal* 59(3): 585-597.
- Mills, L. and G. Plesko, 2003, "Bridging the Reporting Gap: A Proposal for More Informative Reconciling of Book and Tax Income," *National Tax Journal* 56(4): 865-893.
- Neubig, T., 2006, "Where's the Applause? Why Most Corporations Prefer a Lower Tax Rate," *Tax Notes* April 24: 483-486.
- Schmidt, A. P., 2006, "The Persistence, Forecasting, and Valuation Implications for the Tax Change Component of Earnings," *The Accounting Review* 81(2): 589-616.
- Seidman, J. K., 2008, "Interpreting Fluctuations in the Book-Tax Income Gap as Tax Sheltering: Alternative Explanations," Massachusetts Institute of Technology working paper.
- Shackelford, D. A. and T. Shevlin, 2001, "Empirical Tax Research in Accounting," *Journal of Accounting and Economics* 31(1-3): 321-387.
- State and Local Tax Alert. June 30, 2005. "Analysis of Ohio Tax Reform Legislation."
- United States Congress, Joint Committee on Taxation, 2006. "Present Law and Background Relating to Corporate Tax Reform: Issues of Confirming Book and Tax Income and Capital Cost Recovery."
- United States Department of Treasury, 1999. "The Problem of Corporate Tax Shelters: Discussion, Analysis, and Legislative Proposals."

Table 1: Sample Characteristics by Year

Year	Number of Super-Firms	Aggregate Market Capitalization of Super-Firms (\$B)	Aggregate Book-Tax Income Gap of Super-Firms (\$B)	Cross-sectional Standard Deviation of Net DTA (\$B)	Super-Firms with Net DTA		Super-Firms with Net DTL	
					Number	Aggregate Value (\$B)	Number	Aggregate Value (\$B)
1993	72	1,760	-8.15	3.45	31	52.2	41	-75.6
1994	77	1,831	35.83	3.16	36	53.0	41	-76.4
1995	77	2,525	32.15	3.11	32	41.7	45	-81.8
1996	79	3,237	37.90	3.32	31	43.9	48	-95.4
1997	79	4,364	27.96	3.74	30	46.9	49	-107.6
1998	78	5,765	20.26	3.98	35	58.0	43	-107.4
1999	78	6,650	69.10	5.33	33	52.0	45	-145.9
2000	78	6,346	57.80	6.18	30	58.3	48	-165.7
2001	79	5,936	-33.88	6.51	33	69.1	46	-182.5
2002	79	4,543	-2.75	7.26	33	94.1	46	-186.0
2003	79	5,466	137.31	7.47	30	69.7	49	-228.6
2004	79	5,800	84.46	6.94	28	69.1	51	-225.1

Sample includes firms ranked in the Fortune 50 from 1995-2004. To standardize firms across time, firms engaged in merger, acquisition, or divestiture activity with the Fortune 50 ranked firm are included with the Fortune 50 ranked firm to create a “super-firm.” Market capitalization is calculated from Compustat as Common Shares Outstanding (DATA25) multiplied by fiscal year-end price (DATA199). The Book-Tax Income Gap is calculated as hand-collected Pre-Tax Income less estimated Taxable Income, where Taxable Income equals Federal Tax Expense divided by the Maximum Corporate Statutory Rate. Information on Net Deferred Tax Assets (DTA) and Net Deferred Tax Liabilities (DTL) are also hand collected from income tax disclosures in 10-K and Annual Report filings.

Table 2: Book-Tax Income Gap and Share Attributable to Temporary Differences

Year	Median Super-Firm Book-Tax Income Gap (\$M)	Median Share Attributable to Temporary Differences	Mean Super-Firm Book-Tax Income Gap (\$M)	Mean Share Attributable to Temporary Differences	Aggregate Super-Firm Book-Tax Income Gap (\$M)	Aggregate Share Attributable to Temporary Differences
1993	9.6	64.3%	-141.3	-35.7%	-10,172.2	141.9%
1994	97.4	57.1	382.0	68.7	29,411.5	68.5
1995	113.7	65.7	371.8	309.2	28,629.9	79.1
1996	112.9	70.1	464.7	16.9	36,710.0	79.9
1997	58.9	69.9	335.8	181.2	26,525.4	68.5
1998	-14.5	70.0	51.7	-135.4	4,033.2	-76.9
1999	198.7	92.5	978.6	99.8	76,333.1	87.9
2000	133.6	85.2	725.1	221.6	56,561.1	104.4
2001	71.9	86.0	-363.0	133.1	-28,673.7	91.5
2002	304.0	73.0	-92.9	115.5	-7,336.7	-579.0
2003	601.7	77.4	1638.9	-126.2	129,472.2	52.5
2004	500.9	69.0	971.0	121.3	76,711.3	24.4

The Book-Tax Income gap is calculated as Book Income (hand-collected Pretax Income) less Taxable Income, where Taxable Income is calculated as Current Tax Expense divided by the Maximum Corporate Statutory Rate. Temporary differences are calculated as Deferred Tax Expense divided by the Maximum Corporate Statutory Rate; Permanent differences are Book-Tax Income gap less Temporary differences.

Table 3: Components of Net Deferred Tax Assets and Liabilities (\$M), Average per Super-Firm, 1993-2004

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Number of "Super-Firms" in Sample	72	77	77	79	79	78	78	78	79	79	79	79
Allowance for Doubtful Accounts	157	150	162	170	167	204	197	193	252	268	231	196
Benefits												
Employee Benefits	240	237	232	283	336	394	427	387	459	506	505	553
Other Post-Employment Benefits	511	516	519	502	470	408	377	401	381	534	293	238
Pensions	-24	-64	-72	-102	-102	-81	-119	-129	-170	-115	-150	-204
Credits and Carryforwards												
Foreign Tax Credit Carryforwards	29	26	20	5	0	7	11	11	5	5	7	15
NOL Carryforwards	138	149	147	160	159	197	247	205	243	374	394	379
Tax Credits & Other Carryforwards	181	188	187	181	197	189	218	262	352	494	544	624
International Activity-Related	6	7	9	10	20	24	30	39	34	61	-31	-77
Inventory	10	12	15	8	10	12	12	18	9	5	2	-5
Mark-to-Mark Adjustments												
Available for Sale Securities	-2	6	-2	0	-5	-4	9	5	8	1	6	-9
Other Mark-to-Market Adjustments	-116	-31	-195	-186	-262	-275	-319	-254	-180	-210	-304	-303
Merger & Acquisition-Related	-34	-35	-42	-46	-58	-59	-58	-34	-228	-223	-210	-209
Oil & Gas, Environmental	17	21	27	24	17	11	9	11	20	23	38	46
Other Assets	1076	1013	1053	1073	1138	1194	1171	1309	1447	1536	1566	1676
Other Liabilities	-391	-396	-427	-464	-511	-493	-536	-674	-750	-683	-902	-800
Property												
Intangible Assets	-78	-85	-126	-168	-164	-147	-313	-379	-386	-144	-350	-308
Leases	-346	-348	-374	-434	-476	-497	-527	-577	-595	-623	-612	-574
Property, Plant & Equipment	-1444	-1409	-1395	-1433	-1458	-1432	-1542	-1584	-1671	-1984	-2035	-2120
Regulated Accruals and Deferrals	-14	-16	-17	-19	-25	-26	-33	-36	-34	-40	-41	-45
Revenue-Related	-1	9	16	34	37	-14	-8	-39	-21	-22	-3	38
U.S. State-related	5	2	-2	-4	-8	-17	-20	-10	-6	-3	0	-2
Subsidiary-Related Items	-9	2	-10	-9	-13	-50	-207	-293	-366	-318	-387	-408
Valuation Allowance	-235	-256	-246	-234	-234	-178	-228	-207	-239	-606	-569	-676

Information on deferred tax positions are hand collected from income tax disclosures in 10-K and Annual Report filings and assigned to 23 principal categories based on frequency and monetary significance of disclosure items. Amounts presented here are annual averages per super-firm; super-firm is defined in the text.

Table 4: Detail of Select Components of Net Deferred Tax Assets and Liabilities (\$M), Average per Super-Firm, 1993-2004

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Benefits														
Employee Benefits	DTA	266	271	298	359	403	448	504	465	474	529	526	574	
	DTL	-26	-35	-66	-75	-67	-54	-77	-78	-15	-23	-22	-20	
Other Post-Employment Benefits	DTA	529	532	547	532	501	452	424	454	443	567	453	414	
	DTL	-18	-17	-27	-30	-31	-45	-47	-53	-62	-34	-160	-176	
Pensions	DTA	50	34	42	29	33	41	17	1	9	39	40	35	
	DTL	-75	-98	-113	-131	-136	-122	-136	-130	-179	-154	-190	-240	
International Activity-Related	DTA	24	35	37	47	62	78	89	100	120	157	124	117	
	DTL	-18	-28	-27	-37	-42	-54	-60	-60	-86	-96	-155	-194	
Inventory-related	DTA	32	38	40	36	37	43	47	52	49	53	53	43	
	DTL	-22	-26	-25	-28	-27	-31	-35	-34	-40	-47	-51	-48	
Mark-to-Mark Adjustments														
Available for Sale Securities	DTA	0	6	2	2	0	0	18	5	9	5	7	2	
	DTL	-2	0	-4	-2	-5	-4	-9	0	-1	-5	-1	-11	
Other Mark-to-Market Adjustments	DTA	10	60	4	6	4	4	29	25	60	117	115	110	
	DTL	-125	-91	-199	-192	-266	-280	-348	-279	-240	-327	-420	-413	
Oil & Gas, Environmental	DTA	29	29	32	27	24	16	14	17	20	23	38	46	
	DTL	-11	-9	-4	-3	-8	-6	-5	-5	0	0	0	0	
Intangible Assets	DTA	42	44	44	41	45	50	42	30	46	109	122	123	
	DTL	-120	-129	-170	-209	-209	-197	-354	-410	-431	-253	-472	-431	
Regulated Accruals and Deferrals	DTA	24	19	21	20	15	15	5	4	8	2	2	2	
	DTL	-39	-36	-39	-39	-40	-41	-38	-40	-42	-42	-44	-46	
Revenue-Related	DTA	43	44	47	70	78	80	91	102	108	130	138	139	
	DTL	-44	-35	-30	-37	-41	-94	-99	-141	-129	-151	-140	-101	

Information on deferred tax positions are hand collected from income tax disclosures in 10-K and Annual Report filings and assigned to 23 principal categories based on frequency and monetary significance of disclosure items. Amounts presented are annual averages per super-firm. For principal components which are primarily DTA or DTL, we do not present the DTA and DTL detail here.

Table 5: Distribution of Net Deferred Tax Assets as a Share of Firm Assets, 1993-2004

<i>Super-Firm Sample</i>							
Year	Sample Size	Firms with Net Deferred Tax Liabilities			Firms with Net Deferred Tax Assets		
		≤ -5 %	-5 to -3 %	-3 to 0 %	0 to 3 %	3 to 5 %	≥ 5 %
1993	72	25.0%	5.6%	26.4%	30.6%	2.8%	9.7%
1994	77	23.4	9.1	20.8	36.4	6.5	3.9
1995	77	20.8	13.0	24.7	31.2	5.2	5.2
1996	79	24.1	6.3	30.4	25.3	10.1	3.8
1997	79	22.8	10.1	29.1	26.6	7.6	3.8
1998	78	23.1	9.0	23.1	30.8	7.7	6.4
1999	78	26.9	5.1	25.6	30.8	6.4	5.1
2000	78	25.6	5.1	30.8	26.9	5.1	6.4
2001	79	24.1	6.3	27.8	25.3	10.1	6.3
2002	79	22.8	7.6	27.8	25.3	2.5	13.9
2003	79	26.6	3.8	31.6	21.5	7.6	8.9
2004	79	25.3	8.9	30.4	17.7	10.1	7.6
<i>Individual Firm Sample</i>							
Year	Sample Size	Firms with Net Deferred Tax Liabilities			Firms with Net Deferred Tax Assets		
		≤ -5 %	-5 to -3 %	-3 to 0 %	0 to 3 %	3 to 5 %	≥ 5 %
1993	198	21.3%	6.4%	21.3%	39.1%	4.5%	7.4%
1994	216	19.5	6.8	22.7	34.5	10.0	6.4
1995	227	16.5	8.2	27.3	32.5	7.8	7.8
1996	279	17.0	7.1	25.4	35.0	6.7	8.8
1997	260	16.4	7.3	20.6	35.9	8.8	11.1
1998	229	16.5	7.4	18.6	36.4	9.5	11.7
1999	186	20.2	5.3	19.1	38.3	7.4	9.6
2000	165	18.6	7.2	22.2	34.7	9.6	7.8
2001	144	18.6	5.5	23.4	32.4	6.9	13.1
2002	131	18.0	6.0	26.3	28.6	3.0	18.0
2003	124	22.2	6.3	27.0	23.0	10.3	11.1
2004	118	21.7	9.2	28.3	22.5	7.5	10.8

Information on Net DTA and Net DTL are hand-collected from income tax disclosures in 10-K and Annual Report filings. Assets is Compustat Total Assets (DATA6). The distribution in the upper panel is calculated at the super-firm level; the distribution in the lower panel is calculated with each individual firm as its own observation.

Table 6: Distribution of Net DTAs and DTLs as a Share of Firm Assets: Financial and Non-Financial Firms, 1993-2004

<i>Financial Firms</i>							
Year	Sample Size	Firms with Net Deferred Tax Liabilities			Firms with Net Deferred Tax Assets		
		≤ -5 %	-5 to -3 %	-3 to 0 %	0 to 3 %	3 to 5 %	≥ 5 %
1993	34	0.0%	0.0%	23.6%	73.5%	0.0%	2.9%
1994	35	0.0	0.0	28.6	54.3	11.4	5.7
1995	36	0.0	2.8	36.1	52.8	0.0	8.3
1996	39	0.0	2.6	41.0	46.2	2.6	7.7
1997	38	0.0	2.6	50.0	42.1	0.0	5.3
1998	37	2.7	0.0	48.6	43.2	2.7	2.7
1999	31	0.0	3.2	35.5	58.1	3.2	0.0
2000	24	4.2	4.2	37.5	54.2	0.0	0.0
2001	23	0.0	4.3	43.5	39.1	8.7	4.3
2002	22	0.0	4.5	45.5	45.5	4.5	0.0
2003	21	0.0	0.0	47.6	47.6	4.8	0.0
2004	18	0.0	0.0	50.0	44.4	5.6	0.0
<i>Non-Financial Firms</i>							
Year	Sample Size	Firms with Net Deferred Tax Liabilities			Firms with Net Deferred Tax Assets		
		≤ -5 %	-5 to -3 %	-3 to 0 %	0 to 3 %	3 to 5 %	≥ 5 %
1993	168	25.6%	7.7%	20.8%	32.1%	5.4%	8.3%
1994	185	23.2	8.1	21.6	30.8	9.7	6.5
1995	195	19.5	9.2	25.6	28.7	9.2	7.7
1996	244	19.7	7.8	23.0	33.2	7.4	9.0
1997	224	19.2	8.0	15.6	34.8	10.3	12.1
1998	194	19.1	8.8	12.9	35.1	10.8	13.4
1999	157	24.2	5.7	15.9	34.4	8.3	11.5
2000	143	21.0	7.7	19.6	31.5	11.2	9.1
2001	122	22.1	5.7	19.7	31.1	6.6	14.8
2002	111	21.6	6.3	22.5	25.2	2.7	21.6
2003	105	26.7	7.6	22.9	18.1	11.4	13.3
2004	102	25.5	10.8	24.5	18.6	7.8	12.7

Information on Net DTA and Net DTL are hand collected from income tax disclosures in 10-K and Annual Report filings. Assets is Compustat Total Assets (DATA6). The distribution is calculated with each individual firm as its own observation. The sample parallels that of the individual firm analysis in the lower panel of Table 5. Industry was determined using two-digit SIC codes; financial firms are SIC code 61-67.

Table 7: Extrapolations of Aggregate DTAs and DTLs by Year (\$B)

Year	Deferred Tax Assets					Deferred Tax Liabilities					Net Deferred Tax Position				
	Sample Total	Economy Multipliers		Industry Multipliers		Sample Total	Economy Multipliers		Industry Multipliers		Sample Total	Economy Multipliers		Industry Multipliers	
		Asset	Sales	Asset	Sales		Asset	Sales	Asset	Sales		Asset	Sales	Asset	Sales
1993	192	535	533	454	491	-216	-600	-598	-566	-570	-23	-65	-65	-113	-78
1994	208	562	557	507	526	-231	-625	-620	-610	-605	-23	-63	-63	-103	-78
1995	211	600	580	535	539	-251	-715	-691	-669	-647	-40	-114	-111	-134	-108
1996	223	621	601	549	556	-274	-764	-740	-717	-692	-51	-143	-139	-168	-136
1997	231	645	631	581	587	-291	-815	-797	-781	-752	-61	-170	-166	-200	-164
1998	239	752	721	681	705	-289	-908	-870	-849	-843	-49	-155	-149	-168	-139
1999	248	730	713	700	696	-342	-1006	-983	-974	-943	-94	-276	-270	-274	-247
2000	257	739	716	754	700	-364	-1048	-1016	-1056	-983	-107	-309	-300	-302	-282
2001	295	794	799	843	810	-409	-1100	-1106	-1065	-1006	-113	-305	-307	-222	-196
2002	355	941	949	924	953	-447	-1184	-1195	-1118	-1166	-92	-243	-246	-194	-213
2003	356	910	950	900	957	-514	-1316	-1374	-1201	-1295	-159	-406	-424	-302	-338
2004	367	861	1007	944	1012	-523	-1226	-1434	-1288	-1424	-156	-366	-428	-344	-412

Multipliers are calculated using Total Assets (DATA6) and Sales (DATA12) for all Compustat firms with a U.S. or a Puerto Rico domicile and a non-subsidary stock ownership code. Industry multipliers are applied at the individual firm level using two-digit SIC codes.

Table 8: Mean Impact of Federal Statutory Rate Decrease to 30% (\$M)*Panel A: All Super-Firms*

Year	Number of Super-Firms	Beginning of Period Adjusted Net DTA	Revaluation Effect on NI	Current Period Federal Tax Expense	Direct Effect on NI	Total Effect on NI
1994	67	-439	63	562	80	143
1995	71	-389	56	605	86	142
1996	70	-510	73	760	109	181
1997	72	-580	83	771	110	193
1998	70	-672	96	777	111	207
1999	70	-570	81	1,104	158	239
2000	70	-1,243	178	1,202	172	349
2001	72	-1,505	215	570	81	296
2002	73	-1,725	246	749	107	353
2003	74	-1,549	221	864	123	345
2004	75	-2,403	343	1,015	145	488

Panel B: Super-Firms with Beginning of Period Net DTA

1994	29	1,472	-210	656	94	-117
1995	31	1,431	-204	693	99	-105
1996	29	1,154	-165	689	98	-66
1997	30	1,268	-181	648	93	-89
1998	28	1,518	-217	593	85	-132
1999	33	1,552	-222	880	126	-96
2000	31	1,410	-201	952	136	-66
2001	26	1,713	-245	608	87	-158
2002	33	1,536	-219	521	74	-145
2003	29	2,598	-371	606	87	-285
2004	26	2,068	-295	721	103	-192

Panel C: Super-Firms with Beginning of Period Net DTL

1994	38	-1,897	271	490	70	341
1995	40	-1,800	257	536	77	334
1996	41	-1,687	241	811	116	357
1997	42	-1,901	272	860	123	394
1998	42	-2,132	305	900	129	433
1999	37	-2,463	352	1,304	186	538
2000	39	-3,353	479	1,400	200	679
2001	46	-3,325	475	548	78	553
2002	40	-4,415	631	937	134	765
2003	45	-4,222	603	1,031	147	750
2004	49	-4,775	682	1,171	167	849

The sample is limited to firms who separately report Federal Tax Expense. We adjust Beginning of Period Net DTA for Credits and Available-for-sale Securities as discussed in section 4. All effects are calculated assuming a 30% Federal Statutory Rate rather than the actual rate of 35%.

Appendix A: Sample Firms and Years in Sample

Our sample was constructed based on Fortune magazine's annual sales-based ranking of U.S. firms. The top 50 firms for each year from 1995 until 2004 were included in the sample. To mitigate the effects of changes in firm size in the net deferred tax analysis, the tax notes for all firms acquired or sold by Fortune 50 firms during the sample period were also included. For example, Berkshire Hathaway acquired General Re Corp in 1998, so the tax note information for General Re Corp was added to Berkshire Hathaway for years 1993-1997. Similarly, AMR Corp spun off Sabre in 2000, so going forward, tax note details for Sabre were added to AMR Corp for years 2000-2004. We use online firm histories and 10-Ks to research merger and acquisition activity. Four Fortune 50 firms were dropped due to insufficient disclosures: Fannie Mae, Freddie Mac, State Farm, and TIAA-CREF.

For the net deferred tax descriptive analysis, the main Fortune 50 firm and all of its acquired and divested components were combined into a single aggregate firm observation, summing over the deferred tax and liability categories as well as total assets and market values.

The following 74 Fortune 50 "super-firms" are included in our sample: Aetna Inc, Allstate Corp., Albertsons Inc, Altria Group, American Electric Power Co., American International Group Inc, AmerisourceBergen Corp., Amoco, AMR Corp, AOL Time Warner Inc, Aquila Inc, AT&T Corp, Bank of America Corp, BellSouth Corp, Berkshire Hathaway Inc, Cardinal Health, CenterPoint Energy Inc, Chevron Texaco Corp., Cigna Corp, Citigroup Inc, Chrysler, Coca-Cola Co, Columbia/HCA Health, ConAgra Foods Inc, ConocoPhillips, Costco Wholesale Corp., Dell Computer Corp, Dow Chemical Co, Duke Energy Co, Dynegy Inc, Eastman Kodak, El Paso Corp., Enron Corp, Exxon Mobil Corp, Ford Motor Co, General Electric Co, General Motors Corp, Goldman Sachs Group Inc., Hewlett Packard Co., Home Depot Inc., Ingram Micro Inc., Intel Corp, International Paper Co, International Business Machines, ITT Industries Inc, J C Penney Corp Inc, J P Morgan Chase & Co, Johnson & Johnson, Kmart Holding Corp., Kroger Co., Lockheed Martin Corp, Loews Corp., Lowe's, Marathon Oil Corp, MCI Worldcom, McKesson Corp, Merck & Co Inc, Merrill Lynch & Co Inc, MetLife Inc, Microsoft Corp, Morgan Stanley, Motorola Inc, PepsiCo Inc, Pfizer Inc, Procter and Gamble Co, Prudential Financial Inc, Safeway Inc, Sara Lee Corp, SBC Communications Inc, Sears Roebuck Co, Supervalu Inc, Target Corp., The Boeing Co., United Parcel Service Inc, United Technologies, Valero Energy Corp, Verizon Communications Inc, Walgreen Co, Walmart, Wells Fargo & Co, Xerox Corp.

The following 15 firms are included in our sample as part of another super-firm: American Stores, included with Albertsons Inc; Bank One, included with J.P. Morgan Chase & Co; BankAmerica, included with Bank of America Corp; Bell Atlantic, included with Verizon Communications Inc; Chase Manhattan Corp, included with J.P. Morgan Chase & Co; Citicorp, included with Citigroup Inc; Compaq Computer, included with Hewlett Packard Co.; Conoco, included with ConocoPhillips; DuPont E I De Nemours & Co, included with ConocoPhillips; GTE, included with Verizon Communications Inc; Lucent, included with AT&T Corp.; Medco Health, included with Merck & Co Inc; Mobil, included with ExxonMobil Corp; Prudential Insurance, included with Prudential Financial Inc; Texaco, included with Chevron Texaco Corp.

Appendix B: Classification of Deferred Tax Assets and Liabilities

Each deferred tax asset or liability category listed in a firm's 10-K tax footnote is classified into one of the following aggregate categories:

- Allowances for doubtful accounts
- Employee benefits
- Other (non-pension) post-employment benefits
- Pensions
- Foreign tax credit carryforwards
- NOL carryforwards
- Tax credits and other carryforwards
- International activity-related
- Inventory
- Available for Sale Securities
- Other Mark-to-Market adjustments
- Merger & acquisitions-related
- Oil & Gas-related
- Intangible assets
- Leases
- Property, Plant & Equipment
- Regulated accruals and deferrals
- Revenue-related
- U.S. State tax related
- Subsidiary-related
- Valuation Allowances

Items that did not naturally fall into one of the above categories were classified as Other Assets and Other Liabilities depending on the sign of the entry.