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DEFERRED TAX POSITIONS AND INCENTIVES FOR CORPORATE BEHAVIOR
AROUND CORPORATE TAX CHANGES

James Poterba
MIT and NBER

Nirupama Rao
MIT

Jeri Seidman
University of Texas at Austin

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ABSTRACT

A firm's deferred tax position can affect its incentives to lobby for or against tax reform, as well as how the firm is affected by a transition from one tax regime to another. We compile disaggregated deferred tax position data for a sample of large U.S. firms between 1993 and 2004 to analyze the incentives created by these positions and to explore how these positions might affect firm behavior before and after a pre-announced tax rate change. We find substantial heterogeneity in the size and sign 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. Although one might expect firms to defer the reporting of income when there is a pre-announced reduction in the corporate tax rate, we find that approximately one third of the firms in our sample would have an incentive to accelerate income in such a setting because doing so would maximize the value of their net operating loss carryforwards. We estimate that if the federal statutory corporate tax rate had been reduced from 35 to 30 percent in 2004, the resulting revaluation of deferred tax assets would have increased net income in that year by an average of 16.5 percent for firms with a net deferred tax liability, while reducing net income by an average of 11.4 percent for those firms with a net deferred tax asset. Our results suggest that the heterogeneous deferred tax positions of large U.S. corporations create substantial variation in the short-run effect of changes in corporate tax rates on reported earnings. Recognizing these divergent incentives is important for understanding the political economy of corporate tax reform.

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

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1. INTRODUCTION

Conventional wisdom holds that corporate executives support lower statutory corporate tax rates, because after-tax corporate earnings would be higher if tax rates were lower. While for most firms this statement is an accurate long-run characterization, the short-run effects of a corporate rate reduction can differ across firms. Disparities in the tax circumstances of different firms can lead to important cross-firm differences in the short-run effect of changes in statutory tax rates, and potentially in the firms' support for rate reduction.

For example, when corporate tax reform was debated by Congress in 2004, survey evidence suggested that executives at a majority of firms supported corporate tax rate reduction, and that they preferred rate reduction to other tax reform options. Yet some large firms with substantial deferred tax assets that would be subject to revaluation if the statutory corporate rate changed lobbied successfully against a corporate tax rate cut, in part because a rate cut would have reduced the value of these assets. Hanna (2009) explains that "a corporate tax rate cut would cause a small group of manufacturing companies, on behalf of which the representatives were lobbying, to take an immediate charge or "hit" to earnings—thereby reporting lower quarterly net income and lower earnings per share." In part as a result of their efforts, the American Jobs Creation Act of 2004 (AJCA) included a complex domestic activities production deduction that had the approximate effect of a rate cut without requiring firms to write down their deferred assets and liabilities. This episode illustrates how deferred tax assets, and the incentives they create for firms for whom they are significant, can play an important role in the analysis of corporate tax transitions.

This paper aims to better understand the potential effect of deferred tax positions on corporate behavior. It also explores how these positions may affect managerial preferences

regarding corporate tax reform. Deferred tax asset or liability positions recognize the estimated future tax effects attributable to past temporary differences between book and tax income.¹ How a corporate tax reform will affect a firm's reported earnings in the year of its enactment, and how the firm may choose to react to the tax reform, depend in part on the sign and magnitude of its net deferred tax position. We collect data on, and then describe, the amounts and components of deferred tax assets and liabilities for the largest public U.S. corporations between 1993 and 2004. The sample of firms that we study account for nearly forty percent of the aggregate market capitalization of the U.S. corporate sector in 2004.

The presence of deferred tax assets and liabilities is important for understanding the transitional impact of statutory tax rate changes on different firms. It also complicates the task of estimating the revenue impact of a corporate tax change. Deferred tax positions generate incentives for firms to re-time their recognition of income around tax changes. The resulting changes in reported corporate earnings may affect the revenue raised by the tax system. When tax rates are scheduled to decline, firms with large deferred tax assets have an incentive to shift income into the present to utilize deferred tax benefits at a currently high tax rate, just the opposite of the standard prediction that when tax rates decline income will be deferred until the low-tax regime takes effect. In contrast, for firms with large deferred tax liabilities, the incentive to defer income to the anticipated low-tax regime is even stronger than for firms without such liabilities, since by shifting income into the future these firms can discharge their deferred liabilities at the lower rate. Scholes, Wilson and Wolfson (1992) and Guenther (1994) study the Tax Reform Act of 1986 (TRA86), which reduced corporate rates. They find that firms delayed reporting of income so that this income

¹ The difference between reported pre-tax income, and estimated taxable income, is comprised of temporary, permanent and other differences. Temporary differences result from discrepancies in the timing of income and expense recognition for book and tax purposes. Temporary differences affect a firm's cash flow both when they arise and when they reverse; this future effect gives rise to the recorded deferred tax position.

would be taxed at the new, lower tax rate. Maydew (1997) finds that firms generating Net Operating Losses in the years immediately following TRA86 delayed income recognition or accelerated deduction recognition to increase the loss, thereby moving the refunds from the carryback into a tax year with a high statutory rate. These results support the view that firms attempt to shift income across time periods when there are pre-announced changes in statutory corporate tax rates, and that the way they make such shifts depends on their particular tax position.

When the statutory corporate tax rate changes, firms must revalue their deferred tax positions; this revaluation flows through current period net income. As the size of the deferred tax positions of U.S. corporations increases, the potential for revaluation of these balances to materially affect net income, and to affect the way managers and shareholders view corporate tax reform, increases. McChesney (1997) provides examples of how industry lobbying influenced the Tax Reform Act of 1986; understanding deferred tax asset and liability positions may more generally offer insights into firm lobbying incentives regarding corporate tax reform. Mills (2006) and Neubig (2006), among others, suggest that concerns about the changes in reported income that are associated with such revaluations may be an important determinant of whether corporate executives support potential corporate tax reform.

This study explores the influence that deferred tax positions may have on the way firms respond to tax changes, and on the incentives managers may face when they lobby with regard to tax policy. While we do not examine the political actions of firms, we suggest that a political economy perspective on firm behavior might offer useful insights on the support for, and opposition to, various corporate tax reforms from the corporate sector.² We construct and describe components

² We focus on temporary differences, rather than permanent differences, because permanent differences do not accumulate over time in the form of deferred tax assets or liabilities, so they do not create incentives with regard to tax policy transitions in the way that temporary differences do. The full impact of a permanent difference is recognized in the period when the underlying income-generating activity takes place.

of deferred tax assets and liabilities for large corporations. We identify all public firms that are Fortune 50 members between 1995 and 2004 and carefully construct comparable entities for the period 1993 to 2004 by combining merged companies prior to the merger and divested companies after the divestiture. For this set of 81 “super-firms,” we then catalog the components of their deferred tax positions so we can investigate changes within category and in total for each firm. Hand-collection is necessary because the available machine-readable balance sheet data has historically encoded only the long-term deferred tax liability disclosed on the balance sheet rather than the net deferred tax position and components disclosed in the tax footnote. While the most recent Compustat data includes net deferred tax positions, is not complete. This data field is populated for only 50.9 percent of the firm-years in our sample. The machine-readable data therefore does not permit analysis of short-term deferred tax liabilities or any deferred tax assets. This makes it impossible for researchers to measure the magnitude of deferred tax assets that are likely to influence the amount of lobbying against a proposed rate cut or the extent of income shifting that might take place as firms try to utilize NOLs when faced with a statutory tax rate reduction.

The aim of our study is to calculate the size of net deferred tax asset and liability positions in order to allow policy-makers to better understand the incentives facing large U.S. corporations. We also provide evidence on how changes in temporary differences—both aggregate temporary differences and specific types of temporary differences—are linked with the recent rise in the difference between reported pre-tax book income and estimated taxable income (the book-tax gap).

Our analysis has three parts. First, we measure both the total book-tax gap and the portion of the gap attributable to temporary differences. Our hand-collected firm-level data set enables us to overcome missing-data problems that are common in the standard data source, Compustat, in order

to accurately calculate these figures.³ Our findings suggest that temporary differences account for a substantial share of the book-tax gap. When we stratify our data by year, we find that in every year, more than half of the book-tax gap for the median firm in our sample is attributable to temporary differences.⁴ Additionally, both the fraction of firms in our sample with a net deferred tax liability and the size of the average net deferred tax liability rise substantially during our sample. Thus, growth in temporary differences appears to contribute to the widening of the book-tax gap. As a firm's deferred tax position rises relative to its non-tax assets and liabilities, the firm is likely to be more sensitive to proposed changes in statutory tax rates.

Second, we disaggregate deferred tax positions into categories in order to understand whether the recent growth in the book-tax gap attributable to temporary differences is observed over most of the components that contribute to temporary differences, or is driven by a few specific types of temporary differences. This disaggregation provides the first detailed analysis of the components of deferred tax positions for a significant and relatively constant sample of firms over an extended period of time.⁵ Key contributors to the increase in the book-tax income gap include mark-to-market adjustments; property, including leases and both tangible and intangible property; and valuation allowances. The overall growth of the book-tax gap is smaller than the growth in some of the items noted above, however, because some accounting items that reduce the book-tax gap, such as NOL and tax credit carryforwards, also increased during our sample period.

³ We use current tax expense to calculate the book-tax income gap and deferred tax expense to calculate temporary differences. Using hand-collected data, current tax expense (deferred tax expense) is non-missing and non-zero for 92.4 percent (91.2 percent) of the firm-year observations in our sample. Compustat current tax expense, calculated as the sum of TXFED, TXFO and TXS, (Compustat deferred tax expense, calculated as the sum of TXDFED, TXDFO and TXDS) is non-missing and non-zero for 74.8 percent (62.6 percent) of the firm-years in our sample.

⁴ The residual (Book Income less [(Current plus Deferred Tax Expense)/0.35]) should be attributed to permanent and other differences as well as to measurement error. Tax expense not clearly disclosed as current or deferred (for example, tax expense due to Discontinued Operations or disclosed only by jurisdiction) will be included in this residual measure.

⁵ Amir, Kirschenheiter, and Willard (1997) collect similar data on the size and components of deferred tax positions but only study the period 1992-1994. Phillips, Pincus, Rego, and Wan (2004) study a longer period, 1994-2000, but study a random sample of firm-years in this period. We collect data for a relatively constant set of firms over a long period, which allows us to make across-time comparisons.

Finally, we interpret the data we collect on deferred tax assets and liabilities in the context of the behavioral and political economy incentives surrounding a tax rate change. We find that a pre-announced reduction in the corporate tax rate would give a third of the firms in our sample a strong incentive to accelerate income to the high-tax period. Moreover, many of these firms seem to have the capacity to make such a shift. While we are unable to estimate how much income would be shifted in response to such incentives, and the magnitude would depend on the size of the rate change, the nontrivial share of firms affected by such an incentive and the rise in the size of loss carryforwards, suggests that policy-makers should consider the revenue impact of rate-change-motivated income shifting when they estimate the short-run revenue effect of a change in the statutory corporate tax rate.

We also estimate the net income impact of a statutory rate change to demonstrate how this aspect of a corporate rate cut might influence the incentives firms have to lobby for or against specific tax changes. For the average firm in our sample, reducing the statutory federal corporate income tax rate from 35 to 30 percent would result in a \$328 million increase in reported net income as a result of revaluation of deferred tax positions. There is, however, substantial heterogeneity across firms. More sample firms would report an increase than a decrease in net income from revaluations associated with a reduction in the statutory corporate tax rate. Among those that would report an increase, the average impact of a rate reduction to 30 percent would be \$677 million. For firms with a net deferred tax asset, however, the rate reduction would induce an average reduction of \$315 million in net income. Our results quantify a potentially important transitional effect of corporate tax reform on net income—the revaluation effect of deferred tax positions—that policy-makers may want to consider as they try to target transition relief in prospective tax legislation to the various types of firms that may be affected by policy changes.

We divide our analysis of temporary book-tax differences into five sections. The next section—section two—explains how temporary differences generate deferred tax assets and liabilities. This background is particularly important for non-accountants. Section three describes the data set that we have assembled from a sample of SEC filings, identifies a number of potential data limitations and presents summary statistics. Section four disaggregates the book-tax gap, both to estimate the importance of temporary differences within our sample and to provide details on the most significant components of temporary differences. Section five examines how the sum of past temporary differences can affect net income when tax policy changes induce revaluations. A brief conclusion explores implications of our findings for tax policy and suggests future research.

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, 1992, provides guidance for the calculation of tax expense. SFAS 109 uses a balance sheet approach to determine provision for income taxes. Deferred tax expense is calculated as the change in the firm's net deferred tax position. To calculate the end-of-period deferred tax position, temporary differences are cumulated over time and multiplied by the statutory corporate tax rate that the firm expects to be in effect, under enacted laws, when the temporary difference reverses. Temporary book-tax differences are the result of disparities in the timing of an income component's inclusion in book and tax earnings. When expected 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 or reverse in the current period.⁶ When tax rates change, the balance sheet approach adopted in SFAS 109 requires revaluing net

⁶ Under SFAS 109, temporary differences are recorded at their full tax-effect and are not discounted to reflect any timing considerations.

deferred tax positions. The revaluation of the deferred tax asset or liability is then included in net income through the deferred tax expense or benefit.⁷

While the balance sheet approach of SFAS 109 may appear relatively complicated, in most instances the following simplification yields approximately the same result.⁸ 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.⁹ Taxable book income equals pretax 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 income but inclusion of tax-exempt interest in pretax book income is an example of a permanent difference. The effect of permanent differences on the firm's net income, taxable income, and cash flow is fully reflected in the year when these differences occur.¹⁰

While temporary differences do not affect total tax expense, they do 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. For example, the difference between book and tax depreciation is a temporary difference. Temporary differences affect the partition of total tax expense between current and deferred tax expense. In the absence of revaluation, temporary differences do not affect net income.

⁷ Revaluation of the deferred tax balance flows through net income regardless of whether or not the creation of the deferred tax balance affected net income. For example, deferred tax positions associated with unrealized gains and losses on available for sale securities affect other comprehensive income rather than net income but revaluation of these positions would affect net income.

⁸ This simplification does not hold when the statutory rate changes, merger activity occurs, or in certain other settings.

⁹ We refer to tax credits and other rate adjustments that affect current tax expense but not taxable income as other differences. These other differences confound our estimate of taxable income.

¹⁰ When permanent or other differences are not able to be utilized in the period in which they arise (for example, excess charitable contributions or R&D credits), a deferred tax asset will be created to record the expected benefit from using this permanent or other difference in the future. In these cases, permanent and other differences may affect net income, taxable income, and cash flow in additional years. In general, deferred tax assets related to permanent and other differences are small relative to those related to temporary differences.

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

Temporary differences generate a disparity between current-period pretax book and tax income, but they also generate a future, opposite-signed effect on taxable income. Temporary differences also affect cash flow twice—both in the period in which they arise and defer a tax payment or receipt and in the period in which they reverse and generate the deferred tax payment or benefit.

Deferred tax positions equal the current statutory corporate tax rate times the sum of differences that will reverse in the future, which equals the historical sum of the firm's temporary differences. Firms with a positive sum of temporary differences have a net deferred tax liability (DTL): they have accelerated tax deductions relative to accounting expenses or have recorded income for accounting purposes that has not been recognized yet for tax and they will owe tax when this difference reverses. Firms for which taxable income has exceeded pretax book income, in contrast, have a deferred tax asset (DTA); they are entitled to future tax relief either because they have already paid additional taxes relative to their tax expense, either on taxable income that has not yet been reported for accounting purposes or on accelerated expenses relative to tax deductions, or because they have a tax benefit (a tax credit or NOL) they have not yet been able to use.

For a firm in steady state, with constant nominal-dollar investment flows and other balance sheet items, temporary differences should not affect pretax book income relative to taxable income. For example, the reductions in taxable income relative to pretax book income generated by recently-acquired assets subject to accelerated depreciation should just offset the increases in taxable income relative to pretax book income on older assets that have already been completely depreciated for tax purposes. When the firm experiences swings in investment from year to year, however, or is growing, temporary differences associated with different vintages of investment will not be of equal

magnitude so they may affect book relative to taxable income. Similar patterns could emerge as a result of variation over time in 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.¹¹ This permits an assessment of the potential tax benefit associated with a deferred tax asset.

Disaggregating deferred tax assets and liabilities makes it possible to study many aspects of these deferred tax positions, but we are aware of only four studies that have moved beyond machine-readable data to focus on the components of the deferred tax account.¹² Phillips, Pincus, Rego and Wan (2004) disaggregate changes in deferred tax positions to explore which types of deferred tax positions reveal aggressive financial reporting. They find that changes in deferred tax positions related to revenue and expense accruals and reserves are particularly likely to signal aggressive financial reporting. 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

¹¹ A valuation allowance is a contra-asset account that reflects the value of deferred tax assets that are not likely to be recognized. The deferred tax asset is netted with the valuation allowance to assess the firm's expected future tax benefit.

¹² Several studies analyze a portion of the deferred taxes. For example, Miller and Skinner (1998) and Bauman, Bauman, and Halsey (2001) study the valuation allowance related to deferred tax assets.

find that the decline in corporate rates had a favorable effect on the market value of firms with deferred tax liabilities, after controlling for the other effects of tax reform on these firms. Chen and Schoderbek (2000) distinguish changes in deferred tax positions that were triggered by the 1993 corporate tax rate increase from other changes to deferred tax positions. They find that analysts reacted in roughly the same way to both types of changes, even though the persistence and predictive power of the two are likely to differ. Finally, Amir, Kirschenheiter, and Willard (1997) disaggregate deferred taxes and find some evidence that market participants consider the source of deferred tax positions in valuation. We follow these studies in disaggregating deferred tax balances, but we focus on how temporary differences change over time and on how they affect the income statement rather than market values.

III. DATA COLLECTION

Machine-readable data, such as the deferred tax liability balance recorded by Compustat, measure firms' deferred tax positions with substantial noise. Until recently, Compustat reported long-term deferred tax liabilities as shown on the balance sheet, but 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.¹³ Compustat's Fundamentals database, introduced in 2007, collects data on net deferred tax positions as well as the balance of short-term and long-term deferred tax assets and liabilities.¹⁴ This dramatically improves the ability of researchers to measure the net deferred tax positions of firms.

¹³ For example, the 2005 balance sheet for Kimberly-Clark reports a current deferred tax asset of \$223.4 million and a long-term deferred tax liability of \$572.9 million. Legacy Compustat only collects the liability disclosed on the balance sheet of \$572.9 million. Even if Compustat had also collected the balance-sheet-disclosed current asset of \$223.4 million, the user would not have been able to tie to the footnote-disclosed net deferred tax liability position of \$121.4 million because of deferred tax positions included in other assets on the balance sheet.

¹⁴ Returning to the example in the footnote above, for 2005 Kimberly-Clark, Fundamentals Compustat collects \$223.4 million for short-term deferred tax assets, \$228.1 million for non-current deferred tax assets, and \$572.9 million for long-term deferred tax liability as well as the net deferred tax liability position of (\$121.4) million.

However, the Fundamentals dataset does not yet contain data for all firms for all years.¹⁵ Our dataset has many advantages over Legacy Compustat. Relative to Fundamentals Compustat, its primary advantage is its completeness.

A second limitation of machine-readable data is that it does not allow detailed component-based analysis of deferred tax asset and liability positions. As part of our study, we endeavor to provide evidence about which types of differences have contributed to the rise in the book-tax gap. A second benefit of our dataset over both Fundamentals and Legacy Compustat is that it includes information on the type of temporary difference which created the deferred tax position.

To overcome the limitations of existing data sets, 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.¹⁶ 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 of our sample years, 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

¹⁵ Fundamentals Compustat has backfilled tax data for a number of firms and continues to backfill fairly rapidly (nearly 30 percent of our sample has become populated in the last 6 months.) However, only 50.9 percent of the valid observations during our period have a non-missing value for Net Deferred Tax Balance. Researchers will find comfort in the fact that 96.9 percent of the Net Deferred Tax Balances collected by Compustat are approximately equal to the Net Deferred Tax Balances we hand-collected.

¹⁶ Prior to 1995, FORTUNE rankings included only manufacturing firms. To avoid including firms that are only in the FORTUNE 50 due to the exclusion of non-manufacturing firms, we formed our sample using the FORTUNE rankings from 1995-2004.

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 “super-firms” by combining the distinct accounts of the two firms that subsequently consolidated. This process is designed to minimize discrete changes in deferred tax positions that are due to acquisitions. However, no methodology we know of will completely eliminate these changes because the merger itself can create deferred tax assets and liabilities.¹⁷

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 companies. This increases the number of firms in our sample in at least one year to 420; these firms combine to create 81 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 71 in the first year (1993) to 78 in the final year (2004). Appendix A lists the individual firms in our sample. Our analysis relies on super-firms rather than individual companies as our units of observation to preserve comparability across years.

SFAS 109 mandates: (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

¹⁷ Our super-firm methodology will minimize differences due to non-taxable mergers accounted for as a pooling-of-interest. However, a non-taxable merger accounted for as a purchase will result in stepped-up basis for book but not tax, increasing deferred tax liability positions. While our methodology (taking the change between the merged firm and the sum of the target and the acquiring firm) will usually reduce the change relative to considering a change between the merged firm and the acquiring firm only, our methodology does not always eliminate the change caused by the merger.

(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 match each firm-year observation with Compustat using both firm name and year, and validate the match using total assets and net income.¹⁸ We collect the tax summary, rate reconciliation, and the 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.

There are several data limitations inherent in our categorized data. First, our ability to categorize deferred tax assets and liabilities is dictated by the level of disclosure provided in the 10-K. Firms who disclose relatively few line items or use vague language hamper our categorization efforts. Second, SFAS 109 is a world-wide consolidated firm disclosure. Most firms are taxed in multiple jurisdictions, but they do not make jurisdiction-specific income tax disclosures. Rather than allocating DTAs and DTLs across jurisdictions in an arbitrary fashion, we assume that all DTAs and DTLs relate to federal temporary differences. Finally, there may be heterogeneity across firms in the auxiliary assumptions that are used to compute and present the value of DTAs and

¹⁸ 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 48 firm-years where neither AT nor NI corresponded to our hand-collected total assets and net income numbers. The majority of differences were due to small restatements. We dropped 17 firm-years, 15 for which Compustat did not have any data and two where a stub year or merger caused a mismatch.

DTLs. We do not have any information regarding the detailed calculations underlying the tax footnotes, so we are unable to address such potential heterogeneity and its effects on our estimates.

IV. SUMMARY FINDINGS

We begin our analysis by reporting summary statistics. Table 1 reports aggregate and median values of the estimated book-tax income gap, temporary differences, and the share of the book-tax income gap attributable to temporary differences for our super-firm sample. We define the book-tax income gap on a world-wide basis as Pretax 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 percent throughout our sample). We calculate temporary differences as Deferred Tax Expense divided by 0.35. We present and discuss two alternative calculation approaches in Appendix C. The share measure equals the book-tax gap due to temporary differences divided by the total book-tax gap. While Compustat in principle collects the data necessary for both of these calculation, we find that Current Tax Expense in Compustat, which we calculate as the sum of TXFED, TXFO and TXS, is missing or zero for 25.2 percent of the firm-year observations. By comparison, Current Tax Expense is only missing or zero for 7.6 percent in the comparable set of firm-years in our hand-collected data. Deferred Tax Expense in Compustat, which we calculate as the sum of TXDFED, TXDFO and TXDS is missing or zero for 37.4 percent if the firm-year observations; it is missing or zero for 8.8 percent of the firm-year observations in the comparable component of our dataset. In light of these discrepancies, we use hand-collected data for the calculations throughout the paper.

[insert Table 1 around here]

The third through fifth columns of Table 1 present medians. The median share attributable to temporary differences is the median of the ratio estimated temporary differences/estimated total

book-tax gap, calculated at the super-firm level. For the median firm in our sample, there is variation across years in the share of the imputed book-tax difference attributable to temporary differences, ranging from 61.3 percent in 1994 to 93.2 percent in 1999. In every year, however, estimated temporary differences comprise the majority of the estimated book-tax gap for the median super-firm in our sample.

In columns six through eight of Table 1, we report aggregate statistics. The aggregate share attributable to temporary differences is calculated as the sum of temporary differences across super-firms divided by the sum of the book-tax gap across super-firms. This measure offers further insight into the distribution of temporary differences. For example, in 2001 the median super-firm reports a positive book-tax gap and positive temporary differences but the aggregate figures are both negative. Just slightly less than half of the sample—43.6 percent—reports a negative book-tax gap in 2001 and it is on average significantly larger at (\$2.942) billion than the average positive book-tax gap of \$1.814 billion. The difference between the median and the aggregate (or the mean) arises because firms with large book-tax gaps or large temporary differences are more influential in the computation of the aggregate measure than in the computation of the median. For instance, the very large aggregate share attributable to temporary differences in 2002 is driven by AOL Time Warner Inc., which reports a book-tax gap of (\$46.254) billion but temporary differences of only (\$1.42) billion.¹⁹ Even though the aggregate ratio is less stable than the median ratio, both measures yield a similar inference: temporary differences are the largest component of the book-tax gap for the firms in our sample.

¹⁹ There is not a lone culprit for the negative share attributable to temporary differences in 1998 but rather three super-firms that report large negative book-tax differences and either a small negative or a positive book-tax gap: Citigroup Inc., International Business Machines, and Johnson & Johnson. Removing these three super-firms results in an aggregate book-tax gap of \$9.588 billion, 28.4 percent of which is attributable to temporary differences.

Table 2 presents additional information on the total market value and assets for the firms in our sample. Market Value of Equity is calculated as Compustat Common Shares Outstanding (CSHO) multiplied by fiscal year-end price (PRCC_F); all other variables are hand-collected. With regard to market value of equity (assets), our sample represents 39.2 percent (41.9 percent) of the Compustat universe in 2004 and averages 41.2 percent (40.3 percent) over our whole sample period.

The last four columns in Table 2 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 of 72 super-firms report net deferred tax assets that total \$52.2 billion, while the remaining 41 report net deferred tax liabilities totaling \$79.7 billion. The proportion of net DTL firms increases through our sample period, and in 2004, 27 of 78 super-firms report net DTAs. While Neubig (2006) cites a recent survey that suggests that the majority of surveyed firms prefer a lower corporate tax rate to other incremental or fundamental tax reforms, Table 2 suggests that there is a significant minority of firms that would experience at least one adverse effect of such a rate reduction—a decline in the value of their DTAs.

[insert Table 2 around here]

Table 2 suggests a rising share of firms with net DTLs during our sample period. A net DTL, indicating cumulative book income higher than taxable income, could be due to a number of factors, including but not limited to aggressive financial reporting which raises pretax book income and aggressive tax reporting which lowers taxable income. In addition to showing an increase in the proportion of firms with a net DTL, the table also shows that firms with a net DTL have larger deferred tax positions than firms with a net DTA. In 1993, the average net DTL is \$2.0 billion while the average net DTA is \$1.7 billion. The average net DTL increases by 122 percent during our

sample period, to \$4.4 billion in 2004, while the average net DTA increases by only 42 percent. This is consistent with the increase in DTLs over our sample period that was evident in Table 1.

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. We report means of these disaggregate measures to facilitate comparison across years with different sample sizes.

[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 is Property. Early in the sample, the most important source is 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 106, *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 DTA values associated with Benefits. By the end of the sample in 2004, Credits and Carryforwards replaces Benefits as the most significant deferred tax asset, although Benefits remains a major contributor. Although the economy had substantially recovered by 2004, many firms likely still have unused loss and credit carryforwards from the economic downturn of 2001.

While the overall ranking of various components of deferred tax assets 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. NOL Carryforwards increase 248 percent while Other Tax Credits and Carryforwards increase 148 percent, consistent with the extension of the carryforward period under the Taxpayer Relief Act of 1997. Deferred tax liabilities related to Property, Plant and Equipment (PPE) increase 45 percent. Possible explanations for the rise in PPE include special “bonus tax depreciation” that took effect in 2001 as well as the implementation of SFAS 142, which removed book amortization of intangible assets. Liabilities related to Intangible Assets and Leases rise 113 percent and 77 percent, respectively. Intangible Assets includes goodwill and is likely a result of substantial merger activity recently. Some fraction of the rise in leasing-related deferred tax components may reflect a rise in either, or both, of aggressive financial and tax reporting using leased assets. Table 3 also shows that book revenues rose relative to tax revenues during the 1990s, a result consistent with Plesko’s (2004) study. The data in Table 3 suggests that the increase in temporary differences that contributed to the rise in the book-tax income gap was not driven by a single source, but was instead the result of increases in many deferred tax liabilities including Property, Subsidiary-Related Items and Valuation Allowance (the latter being a contra-asset).

In addition to describing which categories have contributed most to the rise in temporary differences, Tables 3 and 4 offers insight into the deferred tax positions that are more likely to be manipulated if managers foresee changes in statutory tax rates. Between 1993 and 2004, the stock of deferred tax assets related to total loss and credit carryforwards increased nearly 200 percent. While much of this increase was offset through increases in Valuation Allowances, the rise in loss- and credit carryforward-related deferred tax positions still suggests in the event of a pre-announced decline in the corporate tax rate, there would be strong incentives to accelerate the recognition of income, and thereby to utilize carryforwards at a higher tax rate than will prevail in the future. Table

4 separates deferred tax assets from deferred tax liabilities for sub-categories 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 deferred tax liability for others. For example, a firm that receives cash but has not yet provided the service may have to pay income tax on that cash but does not record revenue until the associated goods or services are delivered, and so will record 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 closes but recognizes the gain for tax purposes as the payments are received, will have a deferred tax liability. Disaggregating into the asset and liability positions for certain categories also allows us to see the effect of changes to book or tax calculation of these items.

SAB 101, published in late 1999, tightened guidelines regarding how companies can recognize revenue; SAB 104, published in late 2003, further curtailed aggressive financial recognition of revenue. Evidence in Table 4 is consistent with both of these pronouncements—the upward trend in the DTL for Revenue-Related slows beginning in 1999 and even reverses beginning in 2002.²⁰ Table 4 presents additional detailed 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]

The foregoing tables suggest that temporary differences are a significant portion of the book-tax income gap and provide evidence on the components of these temporary differences. We now explore the size of deferred tax positions relative to assets. This normalization is helpful for judging the importance of DTAs and DTLs relative to firm value. Table 5 reports the distribution of

²⁰ An alternative explanation for the observed trend in Revenue-Related deferred tax positions that we cannot rule out is the slowing economy.

net DTAs and DTLs 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 super-firms and individual firms reported a net deferred tax position in excess of five percent of assets. Although the table does not show it, almost 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 position 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 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. We have not separated these two groups in our earlier tables because we did not find a significant difference between them in the average (unscaled) size of the deferred balance positions or in the percent of the book-tax gap attributable to temporary differences. However, in Table 6, we separate financial and non-financial firms; their balance sheets appear to be affected differently by deferred tax positions.

[insert Table 6 around here]

Financial firms have relatively smaller deferred tax positions than non-financial firms, largely because their base of financial assets is so large. In every sample year, more than three-quarters of the financial firms in our sample have a net deferred tax position, either positive or negative, that represents less than three percent of total assets. About half of non-financial firms, in contrast, have deferred tax positions in this range. The extreme values of the ratio of deferred tax positions to firm assets are also smaller for financial than for non-financial firms. The maximum (minimum) Net Deferred Tax Position/Assets for a financial firm occurred in 1994 (1997) and was

16.2 percent (-18.5 percent) while the maximum (minimum) Net Deferred Tax Position/Assets for a non-financial firm occurred in 2001 (1995) and was 48.0 percent (-46.3 percent). For financial firms, the net deferred tax positions as a percentage of assets are distributed more tightly around zero than are the comparable positions for non-financial firms.

V. TEMPORARY DIFFERENCES AND FIRM BEHAVIOR

The presence of deferred tax positions on a corporation's balance sheet may affect several aspects of firm performance and create a range of incentives that may influence firm behavior. In this section, we describe several consequences of the presence of temporary differences. To focus attention on a concrete policy setting, we consider a situation in which the statutory corporate rate is expected to decline.

Income Re-Timing Incentives

Firms with deferred tax assets and liabilities face incentives to alter the timing of reported income in the periods immediately surrounding a tax rate cut. In the period prior to the rate cut, absent deferred tax considerations firms will want to shift current period income into the future to pay tax on that income at the lower future rate.²¹ The presence of deferred tax liabilities should exacerbate this incentive—firms will also want to delay the reversal of deferred tax liabilities so the liability is settled at a lower rate than currently recorded. Firms with deferred tax assets, however, will want to receive the deferred benefits at the higher tax rate and so have an incentive to shift income into the current period.

Many firms hold deferred tax positions related to NOL carryforwards—they have carried the NOL as far back as is allowed and some NOL remains to offset taxable profit in future periods. In

²¹ Guenther (1994) discusses nontax costs that limit this type of tax rate arbitrage, including the cost of reporting lower financial income for debt covenants and management compensation. We acknowledge these constraints but do not measure them. Our estimates of the percent of firms who are likely to shift for NOL CF purposes may be considered an upper bound for the percentage of firms who are likely to undertake income shifting into the higher tax regime.

2004, 37 percent of the individual firms in our sample had a beginning-of-year, NOL carryforward-related DTA that would likely be affected by a federal rate cut.²² While firms with deferred tax assets related to NOL carryforwards have a strong incentive to create income in the final higher-tax-rate period in order to receive the benefit of the NOL carryforward at the higher rate, not all firms with a net NOL carryforward may be able to shift income. We assume that firms reporting taxable income have more scope to accelerate income than do firms currently in a tax loss position. In 2004, three of the firms with a net NOL carryforward are estimated to be in a tax loss positions, leaving 26 of the 78 firms with both a beginning-of-year net NOL Carryforward and positive estimated taxable income. This brief analysis indicates that nearly one third of our sample would have an incentive to accelerate income, as well as some capacity to do this. We are unable to extend this analysis to estimate the dollars of income these firms are likely to shift. However, based on Maydew's (1997) finding that the average firm in his sample shifts \$11.2 million of income, or 1.5 percent of Net Sales, in response to a 12 percent decrease in the corporate income tax rate, we believe that the re-timing of corporate income associated with a change in statutory tax rates could be substantial. This suggests that revenue estimators should consider rate-motivated income shifting into their estimates of the short-run revenue effects of a change in the statutory corporate tax rate.

Preference for Tax Rate Change

Temporary differences generally do not affect net income but only affect cash flow. Both when they arise and when they reverse, temporary differences affect the allocation between current and deferred tax expense and therefore affect cash paid for taxes. Generally, the effect when the difference is recorded and when it reverses are equal and opposite. For example, when taxable depreciation exceeds book depreciation, cash outflow for taxes decreases, increasing cash flow

²² In this calculation, we exclude disclosed state and foreign NOL carryforwards as well as carryforwards disclosed together with a tax credit (i.e., Credit and Loss Carryforwards.) The latter exclusion may cause us to understate the percentage of firms with a federal NOL carryforward.

relative to a situation in which book and taxable depreciation are equal. When this temporary difference reverses, book depreciation exceeds taxable depreciation and cash outflow for taxes increases. In both the period in which the temporary difference arises and the period in which it reverses, the temporary difference does not affect net income but does shift cash flow.

However, when tax rates change, the firm must revalue its deferred tax asset or liability, which in turn affects net income. Neubig (2006) and Mills (2006) argue that firms are very sensitive to the impact of tax reform on their reported earnings and recognize the potential income effect through revaluation of DTAs and DTLs. Managers who will report lower earnings as a result of these revaluations may be particularly concerned that analysts may inadvertently assume that these one-time effects are persistent. Chen and Schoderbek (2000) suggest that analysts did not understand the transitory nature of deferred tax revaluations around the 1993 tax rate change—a concern that might heighten managerial concern.

We illustrate the potential net income impact of deferred tax position revaluations with a counterfactual example in which the federal corporate income tax rate drops by five percentage points in 2004.²³ Using the data in Tables 1 and 2, we estimate the revaluation of beginning-of-year deferred tax positions.²⁴ We limit the sample to just those firms that report federal income tax separately. This limited sample includes 80.8 percent of our firm-year observations, representing 81.8 percent of sample adjusted net deferred tax positions. The revaluation calculations exclude deferred tax positions related to tax credits, including foreign tax credits. Because credits directly offset tax liability, rather than taxable income, a rate change will not affect their valuation.

²³ While many other changes in the business environment, including changes in Generally Accepted Accounting Principles, also affect deferred tax positions, we consider a statutory rate change because it is broadly applicable and its impact is relatively easy to estimate.

²⁴ We assume no rate-change-motivated income shifting because we cannot estimate the effect of the income shifting.

Our results are presented in Table 7. 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." This is a persistent and long-lived effect of the rate reduction. If the 2004 corporate tax rate had been reduced to 30 percent, the direct effect would have reduced federal tax expense by \$147 million for the average super-firm. The average super-firm's net income in 2004 was \$3,625 million, so this reduction in tax expense represents an increase in net income of 4.1 percent.

[insert Table 7 around here]

In the year of the rate change, net income reflects both the direct effect and the revaluation effect. While we might expect the deferred tax revaluation to be second-order, for many firms it is considerably larger than the direct effect. Our estimates in Table 7 suggest that for the average super-firm, the revaluation of 2003 deferred tax positions would have increased 2004 net income by \$328 million, or 9.0 percent.²⁵ Our average super-firm would experience a 13.1 percent increase in net income—two-thirds of which is attributable to the revaluation effect. This effect, not surprisingly, differs across firms. For firms with net DTAs, 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. For net DTL firms, on the other hand, the revaluation reduces the value of a balance sheet liability, which increases their net income. Net DTA super-firms in our sample would on average experience a \$315 million revaluation decrease in net DTA and net income.²⁶ The lower tax rate would have decreased these firms' current tax expense and increased their net income by \$103 million. On net, these firms would report a \$212 million earnings decrease due to the rate change, a 7.7 percent decrease in their average net income of \$2,755 million. Firms in our sample with a net

²⁵ In results that are not reported here, we found that the median revaluation effect in 2004 would have increased net income by 2.1 percent. While the median effect is considerably lower than the mean effect of 9.0 percent, it is still substantial.

²⁶ The median revaluation effect in 2004 for Net DTA firms would have decreased net income by 4.2 percent.

DTL would experience, on average, a \$677 million dollar revaluation decrease in their net DTL, and a matching net income increase.²⁷ They would also report \$171 million less in taxes on income generated in the current period. DTL firms average \$4,097 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 20.7 percent for our sample firms with a net DTL.

Although our estimates of DTAs and DTLs provide some guidance on the effects of statutory rate changes, there are several reasons for caution in evaluating our estimates. First, our assumption that all DTAs and DTLs relate to federal temporary differences may lead to some overstatement of the effect of U.S. federal income tax rate changes. Second, not all DTAs and DTLs are affected by statutory rate changes. Tax credit carry-forwards, for example, are not, because they are applied after the tax rate. We address this concern by removing credits from base deferred tax positions where possible when we estimate the revaluation effect of a tax rate change. We make the conservative assumption that any disclosure which includes credits, such as “Net Operating Loss and Credit Carry-forwards,” is comprised entirely of credits.

Deferred Taxes and Corporate Tax Reform

A change in the corporate tax rate would affect firms through many channels. Our analysis highlights one aspect of corporate tax reform that is often overlooked: changes statutory rates will affect firms by requiring revaluation of their deferred tax assets and liabilities. This "temporary differences" channel will have divergent effects on firms with net deferred tax assets and those with net deferred tax liabilities, and it may lead their respective managers to have different reactions to tax reform and to pursue different strategies to shift income from the old to the new regime. Managers appear to be sensitive to the impact of tax reform on reported earnings. Chen and Schoderbek (2000) provide evidence that the market does not fully understand the impact of tax

²⁷ The median revaluation effect in 2004 for Net DTL firms would have increased net income by 6.3 percent.

reform on reported earnings, providing some support for this concern. Our findings suggest that for some firms, the effects of some corporate tax reforms on the value of deferred tax assets and liabilities can be substantial. Managers at firms with significant net deferred tax assets may lobby against statutory corporate tax rate cuts, for example, 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. Hanna (2009) describes the policy debate surrounding corporate tax reform in 2003 and 2004. In that episode, corporate pressure from firms with accumulated net operating losses was one factor in Congress' decision to replace the extraterritorial income export incentive with a "qualified production activities" deduction, as part of AJCA, 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 is additional evidence that firms are concerned about the financial statement impact of tax rate changes.

In a different context, Neubig (2006) notes that one concern some firms may have about expanding investment incentives by adopting expensing is that expensing creates deferred tax liabilities that could be subject to revaluation if the corporate tax rate changes in the future. In the event of a corporate rate increase, this would reduce current earnings—an event that some managers may seek to avoid.

Ohio's recent corporate tax reform, described in State and Local Tax Alert (2005), 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, which would lose the ability to use these assets under the new tax regime. These policies provide transition relief to firms that were 'owed' tax relief under the income tax regime and that lost this prospective tax relief as a result of the tax reform.

VI. CONCLUSIONS AND FUTURE DIRECTIONS

This paper explores the role of temporary differences in contributing to the disparity between reported pretax book and estimated tax earnings for large U.S. corporations. Temporary differences comprise a substantial fraction of the book-tax income gap. Temporary differences that increase the book-tax income gap are larger than those that decrease it in our data sample. 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.

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. The observed heterogeneity suggests that firms may be affected in different ways by tax and accounting reforms. We estimate that roughly one third of the firms in our sample have strong incentives to shift income forward to maximize their use of NOL Carryforwards in response to a pre-announced reduction in the statutory corporate tax rate, while a large part of the sample likely has the opposite income shifting incentives. This heterogeneity also affects the net income impact of a statutory rate cut. If the corporate tax rate had been reduced by five percentage points in 2004, then the average firm in our sample would have experienced a \$328 million increase in net income due to the revaluation of its deferred tax positions. The average revaluation effect for a firm with a net deferred tax asset position is a \$315 million decrease in net income while the average revaluation effect for a firm with a net deferred tax liability position is a \$677 million increase. Understanding the disparate incentives created by deferred tax asset and liability positions is important for crafting transitional relief associated with changes in the structure of the corporate income tax.

The prospective importance of deferred tax assets and liabilities in affecting firm behavior and firm incentives is possibly even greater than the findings from our sample suggest. Many corporations are likely to experience growing deferred tax assets as a result of the recession that began in 2007. While the recently-extended NOL carryback period will enable some firms to draw down their deferred tax assets, the new tax provisions will not affect all firms.²⁸ Moreover, as new financial products provide firms with potentially greater control over the timing of income

²⁸ The Worker, Homeownership, and Business Assistance Act, passed in November 2009, allows five-year NOL carryback for NOLs incurred in 2008 or 2009. This is only useful for firms with a tax loss in 2008 or 2009 who paid tax in 2003, 2004 or 2005, the newly accessible period that was not accessible under the prior two-year carryback rules.

recognition, the magnitude of their behavioral response to transitory tax incentives associated with deferred tax assets and liabilities may increase.

Our descriptive findings suggest a number of possibilities for future research. The detailed information on deferred tax positions that we have collected may provide a starting point for studying the interplay between financial accounting for taxes and various aspects of corporate behavior. One particularly interesting question is how managers respond to the incentives created by deferred tax assets and liabilities. Their responses might involve political action in support of, or opposition to, policies that would be beneficial to, or costly for, their firms, or might involve changes in the investment or financing policies that are designed to take advantage of opportunities, or minimize burdens, associated with deferred tax positions. It may, for example, be possible to investigate whether firms that are large contributors to the campaigns of legislators who serve on tax-writing committees are particularly sensitive to the nature of tax reform insofar as they have large deferred tax positions. Data such as that collected for the current project provides a much richer description of the potential heterogeneous effect of tax policies created by cross-firm differences than does the more aggregate data reported in machine-readable databases, and it consequently makes it possible to test more refined hypotheses about firm behavior.

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Table 1: Book-Tax Income Gap and Share Attributable to Temporary Differences

Year	Number of Super-Firms	Median Super-Firm Book-Tax Income Gap (\$M)	Median Super-Firm Temporary Differences (\$M)	Median Share Attributable to Temporary Differences	Aggregate Super-Firm Book-Tax Income Gap (\$M)	Aggregate Super-Firm Temporary Differences (\$M)	Aggregate Share Attributable to Temporary Differences
1993	71	\$25.0	(\$2.5)	67.08%	(\$7,987.5)	(\$14,368.0)	179.9%
1994	76	96.3	72.0	61.34	29,488.4	20,371.7	69.08
1995	76	115.9	47.4	64.10	31,022.9	22,762.2	73.37
1996	78	134.6	155.4	71.36	41,440.6	29,578.7	71.38
1997	78	117.5	136.2	67.69	33,839.3	19,123.2	56.51
1998	77	10.8	10.1	63.17	9,870.7	(2,534.0)	-25.67
1999	77	251.0	245.7	93.20	83,660.6	67,123.7	80.23
2000	78	219.7	238.9	80.97	67,715.3	63,341.0	93.54
2001	78	180.8	142.0	82.22	(20,192.0)	(26,220.9)	129.86
2002	78	302.3	144.1	71.24	2,246.1	42,485.6	1,891.52
2003	78	736.0	477.1	75.62	139,877.3	68,004.2	48.62
2004	78	607.4	296.6	66.63	89,942.7	18,694.0	20.78

All data are hand-collected. 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.” The Book-Tax Income gap is calculated as Pretax Book Income less Taxable Income, where Taxable Income is calculated as Current Tax Expense divided by the maximum corporate statutory rate of 35% in all periods. Temporary differences are calculated as Deferred Tax Expense divided by 35%. Median Share Attributable to Temporary Differences is the median value of (Temporary Differences/Book-tax Income Gap) calculated at the super-firm level. Aggregate measures are computed by summing all firms' book-tax gaps and temporary differences.

Table 2: Sample Characteristics by Year

Year	Number of Super-Firms	Aggregate Market Capitalization of Super-Firms (\$B)	Aggregate Total Assets of Super-Firms (\$B)	Cross-sectional Std. Dev. of Net Deferred Tax Positions (\$B)	Super-Firms with Net DTA		Super-Firms with Net DTL	
					Number	Aggregate Value (\$B)	Number	Aggregate Value (\$B)
1993	71	\$1,718	\$5,202	\$3.5	31	\$52.2	40	-\$79.7
1994	76	1,804	6,328	3.3	35	52.7	41	-81.2
1995	76	2,484	4,918	3.2	32	41.5	44	-83.7
1996	78	3,199	5,719	3.4	31	43.8	47	-97.4
1997	78	4,311	6,768	3.8	29	48.2	49	-110.5
1998	77	5,764	7,295	4.0	33	56.9	44	-108.2
1999	77	6,651	8,305	5.4	33	52.0	44	-148.0
2000	78	6,468	9,340	6.2	31	58.3	47	-166.5
2001	78	5,938	10,229	6.6	33	69.1	45	-181.6
2002	78	4,543	10,625	7.3	33	94.1	45	-186.9
2003	78	5,466	11,757	7.5	29	68.4	49	-226.9
2004	78	5,800	13,302	7.0	27	65.4	51	-226.6

All data are hand-collected except as noted. 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 as Common Shares Outstanding (Compustat CSHO) multiplied by Fiscal Year-End Price (Compustat PRCC_F).

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

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Allowance for doubtful accounts	206	193	206	226	239	264	250	212	283	287	255	244
Benefits												
Employee benefits	242	241	235	312	380	441	459	452	514	655	434	482
Other post-employment benefits	519	522	526	481	432	365	348	328	335	395	377	318
Pensions	-25	-65	-73	-103	-105	-82	-120	-129	-172	-117	-152	-207
Credits and Carryforwards												
NOL carryforwards	165	168	161	174	174	214	265	310	369	509	524	575
Foreign tax credit carryforwards	18	22	18	1	2	4	9	11	5	5	5	11
Other tax credits & carryforwards	182	190	183	176	197	186	214	215	241	379	435	452
International activity-related	6	4	6	4	22	24	34	44	37	48	-31	-75
Inventory	15	16	18	9	13	15	12	17	8	5	2	-5
Restructuring, Merger & Acquisition	205	141	113	80	45	43	13	-37	34	23	2	41
Oil & Gas, Environmental	23	22	27	17	11	4	4	-9	1	11	25	28
Warranties	5	5	6	4	3	5	5	5	60	84	90	102
Other Assets/Liabilities	454	451	463	456	489	548	556	628	398	517	413	545
Valuation allowance	-248	-268	-257	-243	-248	-186	-234	-255	-245	-615	-578	-688
Expense-related	-40	-55	-55	-48	-36	-39	-65	-75	-97	-129	-169	-197
Mark-to-market adjustments	-117	-15	-193	-186	-276	-300	-361	-275	-286	-345	-451	-484
Property												
Intangible assets	-148	-142	-143	-179	-166	-152	-327	-385	-394	-142	-351	-315
Leases	-208	-217	-227	-256	-280	-266	-293	-328	-333	-376	-365	-369
Property, plant & equipment	-1,479	-1,448	-1,416	-1,450	-1,500	-1,468	-1,584	-1,600	-1,707	-1,989	-2,057	-2,148
Regulated accruals and deferrals	-17	-20	-21	-22	-29	-25	-32	-36	-35	-40	-43	-45
Revenue-related	-139	-113	-114	-125	-132	-205	-220	-210	-219	-197	-178	-93
U.S. State-related	5	2	-2	-4	-9	-17	-20	-10	-6	-3	-1	1
Subsidiary-related Items	-13	-9	-17	-14	-23	-41	-161	-260	-237	-153	-219	-240
Number of "Super-Firms" in Sample	71	76	76	78	78	77	77	78	78	78	78	78
Number of Firms in Sample	201	223	233	285	268	236	193	170	149	134	126	120

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-fir, as super-firm is defined in Table 1 and in the text.

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

		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Benefits													
Employee benefits	DTA	269	276	303	391	452	501	542	536	534	681	572	633
	DTL	-27	-35	-68	-79	-72	-60	-83	-84	-20	-26	-137	-151
Other post-employment benefits	DTA	537	539	553	511	462	409	395	380	395	429	426	368
	DTL	-18	-16	-27	-29	-30	-43	-46	-52	-60	-34	-48	-50
Pensions	DTA	51	35	43	29	34	42	18	1	9	39	40	36
	DTL	-76	-99	-115	-133	-139	-123	-138	-130	-181	-156	-192	-243
Expense-related	DTA	5	6	9	24	28	36	32	53	54	44	48	48
	DTL	-45	-61	-63	-72	-64	-75	-97	-128	-151	-173	-217	-246
International activity-related	DTA	24	33	35	43	60	76	90	99	118	137	118	111
	DTL	-18	-29	-29	-39	-39	-52	-56	-55	-80	-89	-150	-186
Inventory-related	DTA	32	38	39	36	36	43	48	52	50	53	53	44
	DTL	-17	-22	-21	-27	-24	-28	-36	-35	-41	-49	-52	-49
Mark-to-market adjustments	DTA	11	72	7	7	5	7	50	34	83	163	167	135
	DTL	-127	-87	-200	-193	-281	-307	-411	-309	-369	-508	-617	-619
Restructuring, Merger & Acquisition	DTA	210	143	118	86	62	59	27	28	58	49	28	73
	DTL	-5	-2	-5	-5	-17	-16	-14	-66	-24	-26	-25	-32
Oil & Gas, Environmental	DTA	35	33	35	30	27	18	16	18	22	25	40	44
	DTL	-13	-11	-8	-13	-16	-15	-12	-27	-20	-14	-15	-16
Intangible assets	DTA	44	46	46	44	54	61	47	36	50	116	131	136
	DTL	-191	-188	-190	-223	-220	-213	-373	-422	-444	-257	-483	-451
Regulated accruals and deferrals	DTA	22	16	18	18	15	17	7	6	8	2	2	2
	DTL	-39	-36	-39	-39	-44	-42	-39	-43	-43	-42	-44	-47
Revenue-related	DTA	50	49	53	75	85	91	96	118	135	152	157	164
	DTL	-189	-162	-167	-199	-217	-296	-316	-328	-354	-349	-335	-257
U.S. State-related	DTA	7	5	3	2	2	2	7	5	7	7	8	10
	DTL	-2	-2	-4	-5	-11	-19	-26	-15	-13	-10	-9	-9

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 Positions 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	71	25.4%	5.6%	25.4%	31.0%	2.8%	9.9%
1994	76	27.6%	5.3%	21.1%	35.5%	6.6%	3.9%
1995	76	21.1%	13.2%	23.7%	31.6%	5.3%	5.3%
1996	78	23.1%	6.4%	30.8%	25.6%	10.3%	3.8%
1997	78	23.1%	7.7%	32.1%	25.6%	7.7%	3.8%
1998	77	22.1%	9.1%	26.0%	28.6%	7.8%	6.5%
1999	77	27.3%	5.2%	24.7%	31.2%	6.5%	5.2%
2000	78	25.6%	5.1%	29.5%	28.2%	5.1%	6.4%
2001	78	24.4%	5.1%	28.2%	25.6%	10.3%	6.4%
2002	78	23.1%	7.7%	26.9%	25.6%	2.6%	14.1%
2003	78	26.9%	3.8%	32.1%	21.8%	6.4%	9.0%
2004	78	25.6%	9.0%	30.8%	19.2%	7.7%	7.7%
<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	201	21.9%	6.5%	21.4%	38.8%	4.0%	7.5%
1994	223	20.6%	6.7%	22.9%	34.5%	9.9%	5.4%
1995	233	17.2%	8.6%	27.0%	32.6%	7.3%	7.3%
1996	285	17.5%	7.4%	25.3%	34.7%	6.7%	8.4%
1997	268	16.8%	7.1%	20.1%	36.9%	9.0%	10.1%
1998	236	16.9%	7.2%	19.5%	36.0%	9.3%	11.0%
1999	193	20.2%	5.7%	18.7%	38.3%	7.3%	9.8%
2000	170	18.8%	7.1%	21.8%	35.3%	8.8%	8.2%
2001	149	18.8%	5.4%	22.8%	32.9%	7.4%	12.8%
2002	134	17.9%	6.0%	26.1%	29.1%	3.0%	17.9%
2003	126	22.2%	6.3%	27.0%	23.0%	10.3%	11.1%
2004	120	21.7%	9.2%	28.3%	23.3%	6.7%	10.8%

All data are hand-collected. 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 Deferred Tax Positions 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	2.9%	0.0%	23.5%	70.6%	0.0%	2.9%
1994	34	2.9%	0.0%	29.4%	50.0%	11.8%	5.9%
1995	32	3.1%	3.1%	40.6%	43.8%	0.0%	9.4%
1996	36	5.6%	2.8%	44.4%	36.1%	2.8%	8.3%
1997	35	2.9%	2.9%	51.4%	37.1%	0.0%	5.7%
1998	33	6.1%	3.0%	48.5%	36.4%	3.0%	3.0%
1999	28	3.6%	3.6%	35.7%	53.6%	3.6%	0.0%
2000	24	8.3%	4.2%	37.5%	50.0%	0.0%	0.0%
2001	24	0.0%	8.3%	41.7%	37.5%	8.3%	4.2%
2002	23	4.3%	4.3%	43.5%	43.5%	4.3%	0.0%
2003	21	0.0%	0.0%	47.6%	47.6%	4.8%	0.0%
2004	18	0.0%	0.0%	50.0%	50.0%	0.0%	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	167	25.7%	7.8%	21.0%	32.3%	4.8%	8.4%
1994	189	23.8%	7.9%	21.7%	31.7%	9.5%	5.3%
1995	201	19.4%	9.5%	24.9%	30.8%	8.5%	7.0%
1996	249	19.3%	8.0%	22.5%	34.5%	7.2%	8.4%
1997	233	18.9%	7.7%	15.5%	36.9%	10.3%	10.7%
1998	203	18.7%	7.9%	14.8%	36.0%	10.3%	12.3%
1999	165	23.0%	6.1%	15.8%	35.8%	7.9%	11.5%
2000	146	20.5%	7.5%	19.2%	32.9%	10.3%	9.6%
2001	125	22.4%	4.8%	19.2%	32.0%	7.2%	14.4%
2002	111	20.7%	6.3%	22.5%	26.1%	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%

All data are hand-collected except as noted. The distributions are 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 is determined using SIC codes obtained from Compustat; financial firms are SIC codes 6000-6799.

Table 7: Mean Impact of Federal Statutory Rate Decrease to 30% (\$M)*Panel A: All Super-Firms*

Year	Number of Super-Firms	Mean Pre-tax Income	Mean Net Income	Beginning of Period Adjusted Net DTA	Revaluation Effect on NI	Current Period Federal Tax Exp	Direct Effect on NI	Total Effect on NI
1994	66	2,606	4,841	-486	69	569	81	150
1995	69	2,902	1,629	-463	66	615	88	154
1996	69	3,542	2,243	-516	74	763	109	183
1997	72	3,615	2,530	-574	82	769	110	192
1998	69	3,484	2,884	-690	99	789	113	212
1999	69	4,575	3,012	-580	83	1,121	160	243
2000	69	5,152	3,253	-1,241	177	1,219	174	351
2001	71	3,049	1,933	-1,466	209	578	83	292
2002	72	2,785	140	-1,615	231	759	108	339
2003	73	4,520	3,100	-1,438	205	876	125	330
2004	74	5,302	3,625	-2,298	328	1,029	147	475

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

1994	29	3,079	7,234	1,514	-216	656	94	-122
1995	31	3,820	2,448	1,414	-202	778	111	-91
1996	29	3,625	2,337	1,152	-165	683	98	-67
1997	30	3,859	2,552	1,280	-183	658	94	-89
1998	28	3,156	2,677	1,569	-224	593	85	-139
1999	32	4,089	2,645	1,590	-227	881	126	-101
2000	31	4,605	2,920	1,430	-204	952	136	-68
2001	26	3,749	2,459	1,857	-265	608	87	-178
2002	32	2,994	1,808	1,720	-246	537	77	-169
2003	28	3,623	2,493	2,865	-409	629	90	-319
2004	26	4,065	2,755	2,203	-315	721	103	-212

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

1994	37	2,236	2,965	-2,054	293	501	72	365
1995	38	2,154	960	-1,995	285	482	69	354
1996	40	3,481	2,174	-1,724	246	820	117	363
1997	42	3,441	2,514	-1,898	271	849	121	392
1998	41	3,707	3,025	-2,232	319	922	132	451
1999	37	4,995	3,329	-2,457	351	1,329	190	541
2000	38	5,599	3,526	-3,421	489	1,437	205	694
2001	45	2,644	1,629	-3,387	484	560	80	564
2002	40	2,618	-1,194	-4,283	612	937	134	746
2003	45	5,079	3,478	-4,116	588	1,029	147	735
2004	48	5,973	4,097	-4,737	677	1,195	171	848

All data are hand-collected. The sample is limited to firms who separately report Federal Tax Expense. We adjust Beginning of Period Net DTA for Credits 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 81 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 FORTUNE 50 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
- NOL carryforwards
- Foreign tax credit carryforwards
- Other tax credits and carryforwards
- International activity-related
- Inventory
- Restructuring, merger & acquisition
- Oil & Gas, environmental
- Warranties
- Valuation allowances
- Expense-related
- Mark-to-market adjustments
- Intangible assets
- Leases
- Property, plant & equipment
- Regulated accruals and deferrals
- Revenue-related
- U.S. State-related
- Subsidiary-related

Items that were too vague to categorize (e.g., 'other adjustments'), included multiple categories (e.g., 'A/R and inventory reserves') or too unusual to warrant a category (e.g., 'Bond Premiums') were classified as 'Other'.

Appendix C: Example of Calculations using the 2004 10-K of Coca Cola Co.

Baseline calculations, corresponding to entries in our dataset and tables:

Pre-tax book income = \$6222

Taxable income = current tax expense/0.35 = \$1213/0.35 = \$3466

Book-tax income gap = \$6222 - \$3466 = \$2756

Temporary differences = deferred tax expense/0.35 = \$162/0.35 = \$463

Permanent and other differences = book-tax gap less temporary differences = \$2756 - \$463 = \$2293

While we believe the deferred tax method of calculating temporary differences suffers from fewer confounding factors than any other method, we present two alternative methods below. They, like our deferred tax method, contain noise, not bias.

Alternative Method I

One alternative method of calculating temporary differences uses the rate reconciliation to calculate permanent and other differences, and then defines temporary differences as the resulting residual. Reconciling items total 12.9% of pre-tax income. This translates to \$803 tax dollars of permanent and other differences (12.9% x pre-tax income of \$6222) or \$2294 of permanent and other differences (\$803/0.35) for Coca Cola Co. in 2004. When the firm discloses the current/deferred break down for their total tax provision (i.e. current tax expense plus deferred tax expense equals total tax provision), this alternative method results in the same figures as calculated using the first method. However, jurisdiction-specific disclosures and the tax effect of non-recurring items often do not include current/deferred specifics. These disclosures confound this relationship and results in over- or under-stated temporary differences relative to the deferred tax expense method.

Alternative Method II

A third method of calculating temporary differences uses the change in the net deferred tax position, divided by the tax rate. For example, for Coca Cola, this would equal (\$671-\$235)/0.35. This alternative method results in a higher number than is calculated using the deferred tax expense. Text in the 10-K suggests that the discrepancy is due to a valuation allowance booked against foreign deferred tax assets. There are a number of other reasons why the change in deferred tax assets may not equal the deferred tax expense, including mergers and acquisitions, change in accounting standards and change in tax law or tax rates. As such, this method may also result in over- or understated temporary differences relative to the deferred tax method.

CONSOLIDATED STATEMENTS OF INCOME

The Coca-Cola Company and Subsidiaries

Year Ended December 31,	2004	2003	2002
INCOME BEFORE INCOME TAXES AND CUMULATIVE EFFECT OF ACCOUNTING CHANGE			
Income taxes	6,222	5,495	5,499
	1,375	1,148	1,523
NET INCOME BEFORE CUMULATIVE EFFECT OF ACCOUNTING CHANGE	4,847	4,347	3,976
Cumulative effect of SFAS No. 142, net of income taxes:			
Company operations	—	—	(367)
Equity investees	—	—	(559)
NET INCOME	\$ 4,847	\$ 4,347	\$ 3,050

Income tax expense (benefit) consists of the following (in millions):

Year Ended December 31,	United States	State and Local	International	Total
2004				
Current	\$ 350	\$ 64	\$ 799	\$ 1,213
Deferred	209	29	(76)	162

A reconciliation of the statutory U.S. federal rate and effective rates is as follows:

Year Ended December 31,	2004	2003	2002
Statutory U.S. federal rate	35.0 %	35.0 %	35.0 %
State income taxes—net of federal benefit	1.0	0.9	0.9
Earnings in jurisdictions taxed at rates different from the statutory U.S. federal rate	(9.4) ^{1,2}	(10.6) ⁷	(6.0)
Equity income or loss	(3.1) ^{3,4}	(2.4) ⁸	(2.0) ¹⁰
Other operating charges	(0.9) ⁵	(1.1) ⁹	—
Write-down/sale of certain bottling investments	—	—	0.7 ¹¹
Other—net	(0.5) ⁶	(0.9)	(0.9)
Effective rates	22.1 %	20.9 %	27.7 %

The tax effects of temporary differences and carryforwards that give rise to deferred tax assets and liabilities consist of the following (in millions):

December 31,	2004	2003
Deferred tax assets:		
Property, plant and equipment	\$ 71	\$ 87
Trademarks and other intangible assets	65	68
Equity method investments (including translation adjustment)	530	485
Other liabilities	149	242
Benefit plans	594	669
Net operating/capital loss carryforwards	856	711
Other	257	195
Gross deferred tax assets	2,522	2,457
Valuation allowance	(854)	(630)
Total deferred tax assets ¹	\$ 1,668	\$ 1,827
Deferred tax liabilities:		
Property, plant and equipment	\$ (684)	\$ (737)
Trademarks and other intangible assets	(247)	(247)
Equity method investments (including translation adjustment)	(612)	(468)
Other liabilities	(71)	(55)
Other	(180)	(211)
Total deferred tax liabilities	\$ (1,794)	\$ (1,718)
Net deferred tax assets (liabilities)	\$ (126)	\$ 109