

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

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A firm's deferred tax position can influence how it 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 explore how these positions might affect firm behavior before and after a pre-announced change in the statutory corporate tax rate. Our results suggest that the heterogeneous deferred tax positions of large U.S. corporations create substantial variation in the short-run effects of tax rate changes 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

JEL Codes: H25, M41

I. 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 this statement is an accurate long-run characterization for most firms, the short-run effects of a corporate tax rate reduction can differ widely across firms. These disparities, the result of differences in the tax circumstances of different firms, can potentially affect a firm's support for rate reduction.

When Congress debated corporate tax reform in 2004, survey evidence suggested that executives at a majority of firms supported rate reduction and preferred it to other tax reform options. Yet some large firms with substantial deferred tax assets that would have been revalued if the statutory corporate rate were cut lobbied successfully against such a cut. Hanna (2010, p. 284) reports:

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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 (EPS). So even though a rate cut would benefit these manufacturing companies in future years, a current charge to earnings was unacceptable ...

In part as a result of this lobbying effort, the American Jobs Creation Act of 2004 (AJCA) included a complex domestic activities production deduction that had the approximate effect of a rate cut but that did not reduce the statutory tax rate and therefore did not require firms to write down their deferred assets and liabilities. This episode illustrates how deferred tax positions, and the incentives they create for some firms, can play an important role in the analysis of corporate tax transitions.¹

Several recent studies, including Shackelford, Slemrod, and Sallee (2009) and Edgerton (2010), examine whether managers focus attention on accounting earnings as well as cash flow. Robinson (2010) studies the market for low income housing tax credits and finds that, holding the tax benefit of the credit constant, firms will incur additional costs to obtain preferred accounting treatment. Managers appear willing to forego cash flow to raise pretax book income.

This paper aims to better understand the potential effect of deferred tax positions on corporate behavior and the way these positions may affect managerial preferences regarding corporate tax reform. Deferred tax asset or liability positions recognize the estimated future tax effects attributable to one type of difference between book and tax income, past temporary differences. The difference between reported pretax income and estimated taxable income is comprised of temporary, permanent and other differences. Discrepancies between book and tax accounting rules that give rise to temporary differences result in a disparity between a firm’s accounting measure of tax liability and its tax payment. This disparity occurs twice — once when the temporary difference is created and again when it reverses. The anticipation of this future reversal gives rise to the recorded deferred tax position. 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 the amounts and components of deferred tax assets and liabilities for the largest public U.S. corporations between 1993 and 2004. Our sample

¹ Variation in firm circumstances with respect to deferred tax assets and liabilities is just one factor that might lead to variation across firms in support for a corporate rate reduction. A firm that had just completed an extensive investment program and expensed many of its investment costs, but was about to begin receiving the earnings from these investments, might be particularly supportive of a rate reduction. A firm that had undertaken similar investments but had been unable to fully expense the investments because of tax loss carryforwards would be relatively less supportive since the value of its carryforward claims would be reduced, along with the tax liabilities on its future earnings, by such a change.

firms account for nearly 40 percent of the aggregate market capitalization of the U.S. corporate sector in 2004.

The presence of deferred tax assets and liabilities not only matters for understanding the transitional impact of statutory tax rate changes on different firms, but also complicates the task of estimating the revenue impact of a corporate tax change. Deferred tax positions generate additional incentives for firms to re-time their recognition of income around tax changes; this may in turn affect tax revenue. When tax rates are scheduled to decline, firms with large deferred tax assets have an incentive to accelerate the recognition of income to utilize deferred tax benefits at the currently high tax rate. For firms that have neither deferred tax assets or liabilities, and that are currently taxable, the prediction is reversed. These firms have an incentive to defer income until the low-tax regime takes effect.² For firms with large deferred tax liabilities, the incentive is in the same direction as for currently taxable firms, but even stronger. These firms have an incentive to defer income to the anticipated low-tax regime since by doing so they can discharge their deferred liabilities at the lower statutory tax rate.

Scholes, Wilson, and Wolfson (1992) and Guenther (1994) study the Tax Reform Act of 1986 (TRA86), which reduced statutory corporate tax rates, and find that many taxable firms delayed reporting of income to take advantage of the new, lower tax rate. Maydew (1997) finds that firms generating Net Operating Losses (NOLs) in the years immediately following TRA86 delayed income recognition or accelerated deduction recognition to increase their losses, thereby moving the refunds from the carryback into a tax year with a high statutory rate. These results suggest that firms engage in shifting income across time periods when there are pre-announced changes in statutory corporate tax rates, and that the nature of these shifts depends on the firm's particular tax position.

When tax rates or other relevant features of the tax code change, firms must revalue their deferred tax positions. This revaluation flows through current period accounting earnings (*Net Income*). As the size of U.S. corporations' deferred tax positions increases, the potential for revaluation of these balances to materially affect *Net Income* increases. While we focus on the impact of corporate tax changes, another recent example — the passage of the Patient Protection and Affordable Care Act of 2010 — illustrates the potential importance of these changes. Leone (2010) explains that this legislation removed a tax benefit firms received by providing retiree drug benefits and required restatements of deferred tax assets related to the benefit that has been removed. For AT&T Inc, this restatement decreased book income by \$1 billion and caused analysts,

² To shift taxable income, firms must often shift cash flow and occasionally book income as well. For example, firms may increase taxable income by accelerating the recognition of revenue, by accelerating the receipt of prepayments, or by slowing payment of non-recurring expenses; the first method impacts book income while the latter two affect cash flow. Financial reporting incentives — either to report higher income now, to smooth income over time, or to report lower income in order to preserve a cushion for the future — may conflict with or exacerbate incentives to minimize tax liabilities. For example, the incentive to report higher current revenue for financial purposes conflicts with the standard tax-minimizing incentive to delay recognition of taxable income around a tax rate reduction.

such as Credit Suisse, to issue guidance for investors on how to interpret this noncash charge. These anecdotes provide support for the suggestion by Mills (2006) and Neubig (2006), among others, that concerns about how potential legislation bearing on taxes and other issues will change reported income as a result of revaluations may be an important determinant of whether corporate executives support such proposals.

This study explores the potential influence of deferred tax positions 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 corporate support for, and opposition to, various corporate tax reforms.³ We construct and describe components of assets and liabilities for large corporations. We identify all public firms that are in the Fortune 50 between 1995–2004 and carefully construct comparable entities for the period 1993–2004 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 each category and in total for each firm.

Hand-collection is necessary because the available machine-readable balance sheet data have historically encoded only the long-term deferred tax liability disclosed on the balance sheet, rather than the net deferred tax position and the components disclosed in the tax footnote. While the most recent Compustat data format includes net deferred tax positions, the process of backfilling prior years that were not originally collected is not yet complete. This data field is populated in the Compustat data file for only 50.9 percent of the firm-years in our sample. The machine-readable data file 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 for or against prospective tax rate changes, 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 potential revaluation effects facing large U.S. corporations. We also provide evidence on how changes in temporary differences — both aggregate temporary differences and specific types of such differences — are linked with the recent rise in the difference between reported pretax 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

³ 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. 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 in which the underlying income-generating activity takes place.

data source, Compustat.⁴ 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.⁵ 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 corporate 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.⁶ Key contributors to the increase in the book-tax income gap include (1) mark-to-market adjustments, (2) property, including leases and both tangible and intangible property, and (3) valuation allowances.

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 have taxable income in the current period, which suggests that they are likely 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 incentive to make such a shift would depend on the size of the rate change, the non-trivial share of firms with such an incentive and the rising value of loss carryforwards,

⁴ We use current tax expense to calculate the book-tax income gap and deferred tax expense to calculate temporary differences. In our hand-collected data set, current tax expense (deferred tax expense) is non-missing and non-zero for 92.4 percent (91.2 percent) of our firm-year observations. Compustat current tax expense, calculated as the sum of federal, foreign, and state current tax expense — Compustat codes *TXFED*, *TXFO* and *TXS*, respectively — is non-missing and non-zero for 74.8 percent of the firm-years in our sample. Compustat deferred tax expense, calculated as the sum of federal, foreign, and state deferred tax expense — Compustat codes *TXDFED*, *TXDFO* and *TXDS*, respectively — is non-missing and non-zero for 62.6 percent of the firm-years in our sample.

⁵ The residual (*Book Income* less $[(\textit{Current plus Deferred Tax Expense})/0.35]$) 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.

⁶ 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, et al. (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 comparisons across time.

suggests that analysts 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 impact of a change in the statutory corporate tax rate on *Net Income* to demonstrate how such a change might influence the incentives firms have to lobby for or against pending tax legislation. 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 explains how temporary differences generate deferred tax assets and liabilities. This background is particularly important for non-accountants. Section III describes the data set that we have assembled from a sample of Securities and Exchange Commission (SEC) filings, identifies a number of potential data limitations, and presents summary statistics. Section IV 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 V examines how the sum of past temporary differences can affect book 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) provides guidance for the calculation of tax expense.⁷ Following the “matching principle,” a central concept of accrual-basis accounting which states that expenses should be matched to the period in which they give rise to revenue rather than to the period in which they arise or are paid, SFAS 109 stipulates that the total tax expense reported in a period should be the estimate of total income taxes due on the pretax book earnings of that period. Generally, accounting earnings reported to investors in a 10-K differ from taxable income

⁷ Under the FASB Codification project, effective in 2009, SFAS 109 is referred to as Standard 740-10. The codification project did not change the accounting treatment but simply reorganized the accounting standards.

reported to the Internal Revenue Service (IRS) on Form 1120, so the total tax expense reported in the 10-K will not equal taxes currently due to the IRS.

While book income and taxable income may differ for a number of reasons, they can be separated into two broad categories: permanent differences and temporary differences. Permanent differences arise when a component of income enters one earnings measure but is never included in the other. For example, all forms of interest income are included in pretax book income but interest on tax-exempt state government bonds is excluded from taxable income. This exclusion is an example of a permanent difference. In contrast, temporary book-tax differences are the result of disparities in the *timing* of when an income component is included in book and taxable income. For example, bad debts are estimated and expensed for book purposes in the period in which the associated revenue is recognized, but bad debts are not deducted for tax purposes until specific receivables are written off.

SFAS 109 requires the calculation of two components of total tax expense, current tax expense and deferred tax expense. Current tax expense measures income taxes due in the current taxable year, while deferred tax expense measures income taxes due in all future taxable years. Total tax expense equals the sum of current and deferred tax expense. Permanent differences primarily affect the calculation of total tax expense by adding to or removing from book income items that will never be a component of taxable income, such as interest on state government bonds, non-deductible fines, and the domestic manufacturing deduction. This implies that total tax expense equals the statutory corporate tax rate times taxable book income less tax credits and other rate adjustments. Taxable book income equals pretax book income less permanent differences.⁸

If a company had permanent differences but no temporary differences, then it would have no deferred tax expense. Its total tax expense would equal its current tax expense. When a company has temporary differences, a portion of its total income tax expense that would be currently due to the IRS based on current period taxable book income is deferred. Temporary differences essentially reclassify a portion of tax expense from current tax expense to deferred tax expense. For example, consider a firm with \$100 of accelerated tax depreciation in excess of straight-line book depreciation. Its current-period taxable income will be \$100 lower than it would have been absent this deduction. As a result of this temporary difference, a tax expense of $\$100 \cdot \tau$ that would have otherwise been due on current taxable book income will be due in some future tax period. In one or more future years, the firm's straight-line book depreciation will exceed its tax depreciation, taxable income will exceed book income, and the $\$100 \cdot \tau$ of previously-deferred tax expense will become due. When the full amount of the deferred tax related to a temporary difference has been paid or received, the temporary difference is said to have "reversed."

⁸ We refer to tax credits and other rate adjustments that affect current tax expense reported in the financial statements but not taxable income reported on Form 1120 as "other differences." These other differences confound our measure of taxable income because we are forced to estimate taxable income from 10-K-reported current tax expense.

Because temporary differences create a reclassification of tax expense between current tax expense and deferred tax expense, they do not affect the total dollars of tax that will be paid over the life of the firm or the total tax expense that is recorded in the company's financial statements. Temporary differences only affect the timing of tax payments. Each temporary difference affects the calculation of taxable income and tax due to the IRS in at least two years — once in the year when it arises, and again in the year or years in which it reverses. In the foregoing depreciation example, the \$100 of accelerated tax depreciation in excess of book depreciation creates a current-year book-tax difference, as well as a future, *opposite-signed* book-tax difference when it reverses. While temporary differences affect both taxable income and cash flow for taxes in at least two years, in the absence of revaluation due to changes in tax rates or laws, temporary differences do not affect total tax expense or book income.

Because temporary differences represent a future obligation to pay cash to or receive tax relief from the IRS, they must be accounted for as financial assets or liabilities. Deferred tax asset and liability positions accomplish this; deferred tax positions equal the current statutory corporate tax rate times the sum of differences that will reverse in the future. Firms for which pretax book income has exceeded taxable income have a net deferred tax liability (DTL): these firms have an accumulation of “favorable” temporary differences that has allowed them to defer tax expense to a future period and this deferral has created a liability to the government. Firms for which taxable income has exceeded pretax book income, in contrast, have a deferred tax asset (DTA); they have an accumulation of “unfavorable” temporary differences that has forced them to accelerate tax payments and they are therefore entitled to future tax relief.

A firm's end-of-period deferred tax position is equal to cumulated temporary differences times the statutory corporate tax rate expected to be in effect, under currently enacted laws, when the temporary differences reverse.⁹ 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.¹⁰ When tax rates change, SFAS 109 requires firms to revalue net deferred tax positions and to include these revaluations in book income through the deferred tax expense or benefit.¹¹

To illustrate the revaluation principle, consider a firm with one relatively new asset subject to accelerated tax depreciation relative to book depreciation and no other temporary differences. In the year when it acquires this asset, the firm records a deferred

⁹ Under SFAS 109, temporary differences are recorded without discounting to reflect the elapsed time until reversal.

¹⁰ This is a simplification of the balance sheet approach of SFAS 109 for expositional purposes. It does not hold when the statutory rate changes, merger activity occurs, or in certain other settings. SFAS 109 actually requires the deferred tax expense to be calculated as the change in the firm's net deferred tax position, rather than as the current period's temporary differences times the statutory rate.

¹¹ 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 expenses 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 nonetheless affect *Net Income*.

tax expense and liability related to this asset in the amount of $\tau * (\text{depreciation}_{1, \text{book}} - \text{depreciation}_{1, \text{tax}})$, where the subscript denotes the age of the asset (with 1 denoting the year of its purchase) and the type of depreciation, tax or book. This expression indicates that at some point in the future the accelerated tax depreciation deduction will be less than the book depreciation expense and then the IRS will expect to receive additional tax at the rate of τ . Similarly, in the next year, the deferred tax liability related to this asset will increase by $\tau * (\text{depreciation}_{2, \text{book}} - \text{depreciation}_{2, \text{tax}})$. The firm now has a deferred tax liability due to the IRS of $\sum_{j=1,2} \tau * (\text{depreciation}_{j, \text{book}} - \text{depreciation}_{j, \text{tax}})$. When τ changes to τ' , not only does the layer added by this year's difference between book and tax depreciation change, but also the balances previously recorded change because the IRS will now expect to settle this liability at τ' , rather than at τ . The new liability recorded on the balance sheet will equal $\sum_{j=1,2} \tau' * (\text{depreciation}_{j, \text{book}} - \text{depreciation}_{j, \text{tax}})$. Assuming that the deferred tax expense for year 2 was recorded at the historic rate τ , an adjustment equal to $\sum_{j=1,2} (\tau - \tau') * (\text{depreciation}_{j, \text{book}} - \text{depreciation}_{j, \text{tax}})$ will be reported in book income. In this example of a net deferred tax liability position, a tax rate decrease will cause the liability to decrease and *Net Income* to increase. If the firm had a net deferred tax asset position, the effects of a rate change would have the opposite sign.

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 categorized as current or non-current based on the underlying asset or liability that gave rise to that position. Deferred tax positions are aggregated based on this classification and both a net current deferred tax asset or liability and a net non-current deferred tax asset or liability are presented on the balance sheet. Second, firms must adjust their reported DTAs and DTLs when laws change, in particular to reflect changes in statutory corporate tax rates. 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.¹² 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 deferred tax positions, but we are aware of only four studies that have moved beyond machine-readable data to examine the components of the deferred tax account.¹³ Phillips et al. (2004) explore which types of deferred tax positions reveal aggressive

¹² A valuation allowance is a contra-asset account that reflects the value of deferred tax assets that is not likely to be recognized. (A contra-asset is an account that is entered on the asset side of the balance sheet even though it has a credit balance. This is done to reflect that the credit — negative — balance in the contra-asset offsets some debit — positive — balance in the associated asset account. The valuation allowance contra-asset decreases the value of the deferred tax asset.) The deferred tax asset is netted with the valuation allowance to assess the firm's expected future tax benefit.

¹³ 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.

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 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. 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) 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, measures firms' deferred tax positions with substantial noise. Until recently, Compustat collected deferred tax liabilities that were separately stated on the face of the balance sheet, but it omitted deferred tax positions reported as assets or included in other liabilities, thereby preventing researchers from identifying firms with net deferred tax assets or from accurately measuring the position of firms with net liabilities.¹⁴ Compustat's new database format (termed "Fundamentals"), 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.¹⁵ This dramatically improves the ability of researchers to measure net deferred tax positions. However, the Fundamentals dataset does not yet contain data for all firms for all years.¹⁶ Our dataset has many advantages over the historical Compustat format (termed "Legacy"). Relative to Fundamentals Compustat, its primary advantage is its completeness.

¹⁴ 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.

¹⁵ In the 2005 Kimberly-Clark example of the previous footnote, 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.

¹⁶ Fundamentals Compustat has backfilled tax data for a number of firms and continues to backfill fairly rapidly (nearly 30 percent of our sample was populated during the first six months of 2010.) However, only 50.9 percent of the valid observations during our period have a non-missing value for *Net Deferred Tax Balance*. We found 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.

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. Neither Fundamentals Compustat nor Legacy Compustat includes information on the type of temporary difference that created the deferred tax position.

We collect data from the tax footnotes in 10-K filings for FORTUNE 50 firms for fiscal years between 1993–2004. Our sample begins in FY 1993 because it is the first year when all firms' financial statements were prepared in accordance with SFAS 109, which took effect for fiscal years beginning after December 15, 1992. FORTUNE ranks firms by gross revenue.¹⁷ 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 1995–2004. 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 1995–2004. We drop four firms from this group: State Farm Insurance and TIAA-CREF, private companies that are not required to file 10-Ks, and Fannie Mae and Freddie Mac, which are government-sponsored enterprises. This leaves a sample of 96 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.¹⁸

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

¹⁷ 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.

¹⁸ 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 purposes, increasing deferred tax liability positions. While our methodology, computing 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.

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). A list of the individual firms in our sample can be found in Poterba, Rao, and Seidman (2010). Our analysis relies on super-firms rather than individual companies as our units of observation to preserve comparability across years.

SFAS 109 mandates: (1) an income tax summary, which details the significant components of income tax expense, (2) 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 (3) 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 carryforwards, 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*.¹⁹ 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. Our procedure for disaggregating DTAs and DTLs into their component parts is detailed in Poterba, Rao, and Seidman (2010).

There are several data limitations inherent in our approach to collecting and disaggregating the components of deferred tax assets and liabilities. First, our procedure is limited 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 DTLs. We do not have any information regarding the detailed calculations underlying the tax footnotes, so we are unable to address such potential heterogeneity or its effects.

¹⁹ 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 Compustat codes *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.

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 Poterba, Rao, and Seidman (2010). 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 calculations, 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 missing or zero for only 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 of 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. Given these discrepancies, we use hand-collected data for the calculations throughout the paper.

The third through fifth columns of Table 1 present medians. The median share attributable to temporary differences is the median of (estimated temporary differences/estimated total book-tax gap), calculated at the super-firm level. For the median super-firm in our sample, the share of the imputed book-tax difference attributable to temporary differences varies across years, 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 super-firms, 43.6 percent, report a negative book-tax gap in 2001. On average, the negative values are significantly larger (−\$2.942 billion) than the positive values of the book-tax gap, which average \$1.814 billion. The difference between the median and the aggregate (or the mean) arises because observations 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

Table 1
Book-Tax Income Gap and Share Attributable to Temporary Differences, 1993–2004

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

Notes: 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 percent in all periods. Temporary differences are calculated as *Deferred Tax Expense* divided by 35 percent. *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.

differences of only $-\$1.42$ billion.²⁰ Even though the aggregate share is less stable than the median share, both measures yield a similar inference: temporary differences are the largest component of the book-tax gap for the super-firms in our sample.

Table 2 presents additional information on the total market value and assets for the super-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 super-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 super-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.

Table 2 suggests that the share of firms with net DTLs rose 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 that raises pretax book income and aggressive tax reporting that 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.

²⁰ 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, IBM, 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
Sample Characteristics by Year, 1993–2004

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

Notes: 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

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

Notes: Hand-collected information on deferred tax positions is assigned to 23 categories based on frequency and monetary significance of disclosure items. Amounts presented are annual averages per super-firm. We do not present DTA and DTL details for components which are primarily DTA or DTL.

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 its increase 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, 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 the Plesko (2004) study. The data in Table 3 suggest that the increase in temporary differences that contributed to the rise in the book-tax income gap was not driven by a 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 offer insight into the deferred tax positions that managers might try to control if they foresee changes in statutory tax rates. Between 1993 and 2004, the stock of deferred tax assets related to loss and credit carryforwards increased nearly 200 percent. While much of this increase was offset through increases in *Valuation Allowances*, the rise in deferred tax positions related to loss and credit carryforwards still suggests that 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 before the statutory tax rate declines.

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 associated 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.

The SEC Staff Accounting Bulletin (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 2002.²¹ 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.

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 the book value of the firm. Table 5 reports the distribution of 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 5 percent of assets. Although the table does not show it, almost 10 percent of both individual firms and super-firms had a net deferred tax position exceeding 10 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.

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.

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 3 percent of total assets. About half

²¹ An alternative explanation for the observed trend in *Revenue-Related* deferred tax positions that we cannot rule out is the slowing economy in the later years of our sample.

<i>Super-Firm Sample</i>							
Year	Sample Size	Firms with Net DTL/Assets in range (%)			Firms with Net DTA/Assets in range (%)		
		≤ -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 DTL/Assets in range (%)			Firms with Net DTA/Assets in range (%)		
		≤ -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

Notes: 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.

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 relative to 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 relative to assets for a non-financial firm occurred in 2001 (1995) and was 48.0 percent (–46.3 percent). For

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 DTL/Assets in range (%)			Firms with Net DTA/Assets in range (%)		
		≤ -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 DTL/Assets in range (%)			Firms with Net DTA/Assets in range (%)		
		≤ -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

Notes: 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.

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 for firm behavior. We now 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.

A. Income Re-Timing Incentives

All firms face incentives to alter the timing of reported income in the periods immediately surrounding a tax rate cut. Absent deferred tax considerations, firms will increase the present value of their after-tax income by shifting income from the period prior to the rate cut into the future in order to pay tax on that income at the lower future rate.²² 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 accelerate income to the period before the tax rate reduction.

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 profits in future periods. In 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.²³ 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, some firms with a net NOL carryforward may be unable 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 calculation suggests 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, Maydew's (1997) finding

²² 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 that are likely to undertake income shifting into the higher tax regime.

²³ This calculation excludes 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.

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 suggests that the re-timing of corporate income associated with a change in statutory tax rates could be large enough to warrant revenue estimators considering such rate-motivated income shifting in their estimates of the short-run revenue effects of a change in the statutory corporate tax rate.

B. Preference for Tax Rate Change

Temporary differences generally do not affect book income, while they do 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 in the current period. In most cases, the effects 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 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. Both when the temporary difference arises and when it reverses, the temporary difference does not affect book 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 book 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 that would occur with revaluation of DTAs and DTLs. Managers who will report lower earnings as a result of these revaluations may be particularly concerned that analysts will inadvertently assume that these one-time effects are persistent — a concern supported by Chen and Schoderbek's (2000) study of deferred tax revaluations around the 1993 tax rate change.

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 5 percentage points in 2004.²⁴ Using the data in Tables 1 and 2, we estimate the revaluation of beginning-of-year deferred tax positions. We do not allow for any income shifting associated with the rate change, since we do not have a shifting elasticity to apply in this setting. 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 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.

²⁴ 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.

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 the "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.

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 of the tax rate change. 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 have experienced a 13.1 percent increase in *Net Income* — two-thirds of which would have been 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 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 carryforwards, for example, are not, because they are applied after the tax rate. We address this concern by removing credits from deferred tax positions where possible when we

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 — still substantial, but considerably lower than the mean effect of 9.0 percent.

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

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

Table 7
Mean Impact of Federal Statutory Rate Decrease to 30% (\$M), 1993–2004

Panel A: All Super-Firms

Year	Number of Super-Firms	Mean Pretax Income	Mean Net Income	Beginning of Revaluation		Current Period Federal Tax Exp	Direct Effect on Net Income	Total Effect on Net Income
				Period Adjusted Net DTA	Effect on Net Income			
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	767	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	2,142	-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	3,145	2,677	1,569	-224	589	84	-140
1999	32	4,089	2,645	1,590	-227	881	126	-101
2000	31	4,501	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	2,219	2,965	-2,054	293	501	72	365
1995	38	2,145	960	-1,995	285	482	69	354
1996	40	3,471	2,174	-1,724	246	820	117	363
1997	43	3,428	2,514	-1,898	271	849	121	392
1998	41	3,690	3,025	-2,232	319	922	132	451
1999	37	4,971	3,329	-2,457	351	1,329	190	541
2000	38	5,570	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

Notes: 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 V. All effects are calculated assuming a 30 percent *Federal Statutory Rate*, rather than the actual rate of 35 percent.

estimate the revaluation effect of a tax rate change. We make the conservative assumption that any disclosure that includes credits, such as “Net Operating Loss and Credit Carryforwards,” is comprised entirely of credits.

C. 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 in 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. Anecdotal and other evidence suggests that managers are sensitive to the impact of tax reform on reported earnings. Our findings suggest that for some firms, the effects of 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 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. In the introduction, we cited Hanna’s (2010) description of the corporate tax reform debate of 2004. Pressure from firms with accumulated net operating losses was one factor in Congress’ decision to enact a “qualified production activities” deduction rather than a reduction in corporate tax rates. For firms with large net deferred tax asset positions, a rate cut would have generated substantial tax expense. Less than two months after the passage of the American Jobs Creation Act of 2004, 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 (FASB, 2004). While firms with deferred tax liabilities would have preferred that 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 for tax purposes is that expensing creates deferred tax liabilities that could be subject to revaluation if the corporate tax rate changes in the future — an event that some managers may seek to avoid.

Ohio’s recent corporate tax reform further 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 (Ohio Department of Taxation, 2006). Alvarez & Marsal Holdings (2008) explain that 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, that 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 40 percent of the firms in our sample of FORTUNE 50 companies reported a net deferred tax position valued at more than 5 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 impact of a statutory rate cut on *Net Income*. If the corporate tax rate had been reduced by 5 percentage points in 2004, 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 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 provide a much richer description of the potential heterogeneous effect of tax policies created by cross-firm differences than do 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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²⁸ The Worker, Homeownership, and Business Assistance Act of 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, since tax payments in those years were not "accessible" under the prior two-year carryback rules.

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